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* Enhancing stakeholder participation in the governance of radiological risks for improved radiation protection and informed decision making, 11-13 September 2019, Bratislava, Slovak Republic

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Abstract

The report presents the Final ENGAGE Project Workshop on “Enhancing stakeholder participation in the governance of radiological risks for improved radiation protection and informed decision making”. The workshop was held in the framework of Work Package 4 (WP4) of the ENGAGE Project. The aims of the workshop were to share the findings from the ENGAGE Project, stimulate mutual learning and co-develop recommendations for enhanced stakeholder participation in relation to medical exposures to ionizing radiation, emergency and post-accident exposure and indoor radon. The workshop was held in Bratislava, Slovak Republic, at the premises of the Lindner Hotel from 11 to 13 September 2019.

All presentations from the workshop can be downloaded from the ENGAGE website:

www.engage-concert.eu .

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1 Introduction

The ENGAGE project, funded under the H2020 CONCERT, aims at *ENhancing stAkeholder participation in the GovernancE of radiological risks*. This two-year project started on November 20th 2017, seeks to identify and address key challenges and opportunities for stakeholder engagement in relation to medical use of ionising radiation; post-accident exposures; and exposure to indoor radon. In all these situations, stakeholder engagement is a key issue for improving the governance of radiological risks and the radiological protection of the exposed individuals.

The project aims are:

- to assess why, when and how stakeholders engage in radiological protection;
- to develop novel approaches to analysing stakeholder interaction and engagement, and provide guidance to meet the challenges and opportunities identified in response to (a);
- to investigate the processes for enhancing radiological protection culture and their role in facilitating stakeholder engagement, and develop guidelines for building radiological protection culture; and
- to build a joint knowledge base for stakeholder engagement in radiological protection.

The ENGAGE Project is organised in four main Work-Packages (WP), coordinated by a management WP, which interact to achieve the objectives as presented on Figure 1.

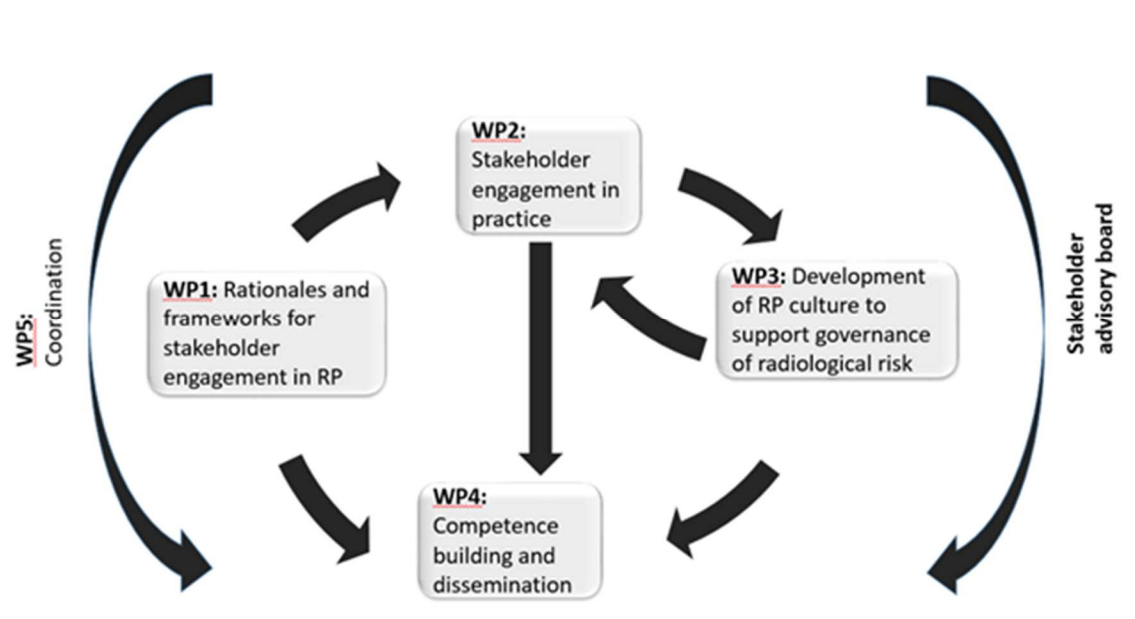


Fig. 1 Interaction between ENGAGE work packages

Dissemination and discussion of results in the form of dialogues, knowledge sharing and mutual learning to and from relevant stakeholders was the main objective of WP4. In particular, Task 4.3 dealt with developing and conducting ENGAGE Final Workshop development and conducting.

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2 ENGAGE Final Workshop

2.1 Objectives and participants

The ENGAGE Final Workshop took place in Bratislava, Slovak Republic, from 11 to 13 September 2019.

Stakeholder engagement is recognized as essential in the governance of radiological risk. The workshop tapped into participants' expertise and experiences on the questions such as How is stakeholder engagement achieved? Whom does it include and why? How can it inform radiation protection practices and decision making?

Three fields have been examined in detail: medical exposures to ionizing radiation, post-accident exposures, and exposure to indoor radon.

Workshop aims were:

- To share findings from the ENGAGE project and stimulate mutual learning;
- To co-develop recommendations for enhanced stakeholder participation in the aforementioned three fields.

The workshop consisted of presentations, panel discussions and facilitated group discussions with feedback reporting.

46 participants from 15 countries attended the workshop (see List in Annex 2). The workshop was open to policy-makers, responsible authorities, non-governmental organizations, researchers, members of the radiation protection platforms, journalists, and any other stakeholders from related fields and civil society that in any form have a stake in radiation protection decision making.

Participants included ENGAGE project partners, stakeholders involved in some of the processes analysed in the case studies, as well as experts and specialists representing international organisations (OECD/NEA, IAEA), professional Associations, radiation protection research Platforms and nongovernmental organisations (Greenpeace, WONCA, NERIS, ALLIANCE, EURADOS, SHARE), international and national institutions and universities (IRSN, PHE, SAFecast, FOPH, FANC/AFCN, NMBU, UPM, Policlinico Universita Palermo) who took part in panel discussions as well as in the working groups discussions.

The detailed findings from case studies were illustrated through posters dedicated to each case study developed under the ENGAGE work packages WP2 and WP3.

Draft findings and recommendations distributed among participants as working materials have been discussed in the working sessions under the following themes (see full programme in Annex 1):

- T1: The conditions for meaningful participation and commitment of institutional and non-institutional stakeholders)
- T2: Broadening the scope of 'participation' in radiation protection (beyond formal institutional approaches, new actors)
- T3: Alignment of different decision levels: local, regional, national and international
- T4: Bridging risk assessment, risk management and risk
- T5: Role of communication, access to information, informed consent
- T6: Ethical aspects of stakeholder engagement
- T7: Radiation protection cultures, including objectives, target stakeholders, content, tools, evaluation processes & Education, training and capacity building

Discussions among participants were held in plenary as well as in groups, either focusing on a particular field of exposure to ionizing radiation (medical, emergency and post-accident, or indoor radon), or grouping participants interested in the combination of different fields. After the thorough discussion of the recommendations introduced by ENGAGE researchers, participants provided their suggestions via rapporteurs for each working group. Follow-up panel discussions gave the floor to plenary discussions of the recommendations for the different themes.

The feedback provided by participants is summarised in section 3 and will provide the basis for consolidating the project recommendations in the final project report.

3 Summary of feedback for draft recommendations

The following summarises the feedback from workshop participants for each of the proposed recommendations.

General comments:

- There is a need for a generic framework on stakeholders engagement;
- The recommendations should make more explicit reference to NGOs as a stakeholder;
- Stakeholders should not only be involved in communications but in decisions;
- Specific attention should be paid to vulnerable groups as they may not be able to make informed decisions;
- There are different levels: individual, organizational / institutional and systemic: for what level is each recommendation intended?; a matrix-table could summarise for who it is meant to and what level;
- Common features for radon and EPR: we need to embark radiation protection (RP) but not only:
 - o Radon in itself is not the problem, it is the management of buildings that causes increased indoor concentrations, this requires the connection between stakeholders (SH), disciplines, governance levels;
 - o EPR: radioactivity is not the only problem: we need to embark not only RP but also other issues and many types of stakeholders;
 - o In both cases there is a need to reset “our way of thinking”. Authorities have to make the effort to embark other colleagues and stakeholders;
- RP experts need to work not “for” but “with” the affected populations: they have to hear what the stakeholders have to say; plan flexibly and create resources;
- The medical context is different because risks and benefits are for the same individual;
- Ethics can improve stakeholder engagement and vice versa; in practice, it helps doing things better;
- It is also important how we do the engagement? Motivations for engagement are important; we should evaluate not only the outcome, but also the internal process;
- All opinions should be represented in engagement processes, “also those that say things you don’t want to hear”;
- Ethics should be in the curriculum for radiation protection experts and professionals.

3.1 Themes T1 and T2

- T1: The conditions for meaningful participation and commitment of institutional and non-institutional stakeholders)
- T2: Broadening the scope of ‘participation’ in radiation protection (beyond formal institutional approaches, new actors)

Recommendation EP&R 1: Consider ways to better align prescriptions, expectations and practice

Recommendation EP&R 2: Broaden the motivations for stakeholder participation to create more meaningful participation.

Recommendation EP&R 3: Broaden the scope of ‘participation’ in EP&R

Recommendation EP&R 4: Develop guidelines on how to engage stakeholders through formal and informal stakeholder engagement

Recommendation Medical 1: A more inclusive approach in medical exposure in both justification and optimization

Recommendation Medical 2: A proactive involvement of different stakeholders could start to be operative on the basis of their commitment

Recommendation Radon 1: Make explicit also the other values – not only the instrumental rationale – for stakeholder engagement

Recommendation Radon 2: Define within the radon action plan the approach for its evaluation and carry out the evaluation together with regional and local authorities

Recommendation Radon 3: Include a structured approach to stakeholder engagement in radon action plans, from design to implementation and evaluation

Recommendation Radon 4: Integrate radon risk management into a more global public environment and health protection approach, with the engagement of all the levels of public authorities involved in these issues

Recommendation Radon 5: Establish a network of (local) radon consultants and experts

EP&R

- Broadening participation before an accident occurs provides valuable input from other stakeholders; participation in drills and expanding networks provides a reality check for problems that may be overlooked and may not work in practice in case of an emergency; authorities ought to seek out more often this kind of feedback, notably from NGOs;
- Broadening participation in EPR is also a corollary of the Aarhus convention which, among others, ensures public access to environmental information held by or for the public authorities; fosters public participation in decision-making which affects the environment; and extends the conditions of access to justice in environmental matters; even though this participation is legally prescribed it is often limited to information provision in prescriptions;
- The focus on expert / authority driven instrumental motivation misses the wider view that stakeholder engagement can deliver;
- It is important in the preparedness phase to identify local leaders: schools can play a central role as they do several types of drills; this can also bring a sense of continuity;
- Informal networks are very important: such networks should be broadened to include citizen groups (e.g. carrying out radiation monitoring); there is a need to acknowledge citizens’ groups;

- How do you generate a sense of urgency (to give enough attention to emergency preparedness)? Extreme voices can actually help motivate that;
- Recommendations should include more practical examples of what is meant (e.g. EP&R2 should be clarified);
- EP&R2: the focus on expert / authority driven instrumental motivation misses the wider view that stakeholder engagement can deliver;
- The Aarhus convention establishes not only the obligation for public participation, but also reasons, form, etc.
- EP&R3: should also look at participation within; are people willing to enter discussions and arguments with those who criticize the process? There can be motivations from authorities to avoid this, how do we motivate it?
- Experts are often not approachable; however, there are some who are and the question is asked what makes a particular actor or voice more approachable?
- Those who have the power to define who is involved should also motivate the people;
- We have to also motivate technocrats about the importance of participation;
- Implementers could use research results about motivation and demotivation of stakeholders to participate;
- There may be a need to involve psychologists to discuss nuclear risk in schools, they should observe how children react to this;
- Authorities should be prepared to respond to 'fake news'; media and citizen groups should be seen as partners;
- There is a need to foster knowledge about citizens' rights, in the same way as for environmental policies or sustainable development;
- The cultural context is very different, thus harmonization (of engagement) is difficult;
- EP&R3: with respect to broadening participation, the Aarhus Convention goes even further than health professionals, parents, school personnel (mentioned in the ENGAGE recommendations); art. 2(5): "The public concerned" means the public affected or likely to be affected by, or having an interest in, the environmental decision-making; for the purposes of this definition, non-governmental organizations promoting environmental protection and meeting any requirements under national law shall be deemed to have an interest;
- EP&R4: The ends of environmental protection, protection of economic and social structures in themselves are also valuable rationales for stakeholder engagement;
- Stakeholders should be at all times appropriately informed - both about the stakeholder involvement process as well as the content of EP&R;
- The added value for stakeholders from participation processes should be an outcome of input from the stakeholders, not an externally imposed "wishful thinking";
- Informal networks of experts are essential; citizen data need to be included;
- People motivated are out there;
- It is important to transform such recommendations into actual policy; this process is rather opaque;
- Recovery is not exercised very well; a lot can be learned from those activities in countries like UK, FR:
 - o EU projects had an important role, but this has to be followed by implementation at national level,
 - o Discussions are best supported by products, such as handbooks,
 - o There is a need to create a culture of stakeholder engagement,
 - o Resources are needed, but it also important to show tangible outputs, at least towards policy and plans;
- SE should be proportionate,

- Planning is very important, feedback is also important;
- Greatest challenge: to keep this network sustainable; should make use of eg networks discussing other risks;
- NGOs shifted their attention in the last two decades to climate change; it is important to take this dynamic into account when thinking who represents the publics; must look at the different layers and identify actors at regional and local level;
- There is an incredibly positive use of the informal engagement space that actors have built during last years for EP&R: eg Fukushima, iodine incident;
- “the real barrier is fear of engagement”;
- One issue to be looked into in more detail is the social media influence in the moment of an emergency;
- NGOs interested in how communication works; they also put focus on evidence based–collaboration with experts important;
- On a structural level: there should be an understanding that citizens data should be included if asked by the people who are doing the measurements.

Medical

- To have patients really involved, this needs to be done at early stage, before decision on radiological procedure is taken, i.e. at the moment of referral, in a discussion on the justification of the procedure;
- This is when a patient contacts a family doctor or specialist, who act as referrers;
- A practical problem will arise because the referring physicians do not know much about IR nor about how to communicate on this particular subject => need to be educated & trained;
- Guidance on benefits and radiological risk can be found in clinical imaging guidelines (= referral guidelines, appropriateness guidelines), but several exist next to one another (iRefer, GBU, German, Austrian,...). Initial attempts to merge these into European guidelines failed, later on and starting from American guidelines, ESR (European Society of Radiology) came up with European guidelines. Unfortunately they are not freely available;
- A next step is at the moment the patient shows up at the radiology department, and it is in general too late already to exercise the involvement to the full extent;
- For low dose exams, patients will not see the radiologist, but rather a nurse or radiographer: again, there may be a need for these people to be E&T'd. For higher dose procedures, and/or high risk (pediatric, pregnant), will in general get to see the radiologist;
- An important stakeholder, often forgotten, is the hospital director, who is in general the “license holder”. Their implication can be very useful in dealing with practitioners who are not radiologists but expose patients anyhow (e g interventional cardiologists, neurologists,...);
- Authorities such as Ministry of Health, radiation protection competent authority should take a lead role in improving the practice;
- How to communicate to patient? Should we or not compare to natural radiations, exposure during air travel, number of chest X-rays ?
- Need to involve public, patient associations to see how they want to be informed;
- How to motivate stakeholders? Give them a voice and include decision making in participation; in CH there is always stakeholder engagement before regulations are set; also finances are needed.

Radon

T1: Recommendation 3

- There are stakeholders who do not know that they are stakeholders -> have to be informed first;
- The population is also a stakeholder;
- Radiation Protection (RP) is considered to be something for experts -> laypeople might even be afraid to have to deal with RP; in addition Radon is not only RP, but includes other aspects as well;
- Talking about pollution might be better understandable;
- The issue of indoor air quality has to be included in general aspects of construction;
- It would be good to give a list of possible stakeholders in the recommendation; the most important ones are the local authorities and construction experts (architects, engineers);
- Population is a very important stakeholder, they feel this is something for experts and feel reluctant to engage with this;
- Stakeholders do not know that they are stakeholders, that what they do have an influence, they have first to be made aware that they are stakeholders;
- Stakeholders should be listed, named in the recommendations;
- Not clear what is meant by “ensure guidelines and support for risk mitigation” (radon 3).

T2: Recommendations 4&5

- The issue of radon has to be broadened to other indoor pollutants;
- RP experts and construction experts do not speak the same language, this has to be considered in any communication;
- In general: this recommendation is very important, but new actors are often difficult to find;
- Radon experts have to be made visible; people with a radon problem do often not know that they could refer to experts;
- There has to be a market for radon experts;
- Construction experts do not know that they have a role in RP;
- Broaden the radon issue to:
 - o Other pollutants
 - o Energy saving measures
 - o Health and environment
- This former point is however complicated by the fact that the other issues are typically in the responsibility of other governmental departments;
- Radon should be treated in the same manner for all buildings regardless of the purpose of the building;
- Radon certificates do not belong in this recommendation;
- At the end all comes down to risk awareness;
- Recomm 5 is not only for local radon experts;
- Trusted experts: we have to find the experts that have natural trust with stakeholders – e.g. in building companies they are known to be expert in this domain, they could take up also radon;
- Broadening: important to include air pollutants in general not just radon, people working on indoor pollution should be made aware of that; energy saving also important;
- When talking to building experts language is often different than RP and architects, so communication between groups very important;
- The process in which radon is treated has to be changed – there should be a centralised agency dealing with all the different aspects – but possible problem with resources;
- Educating radon experts at regional level; in some areas there are experts but people do not know that they exist – problem of information;
- Awareness: people are not aware about radon, and what kind of problem it is – raising awareness is still an issue;
- Radon needs a holistic approach;

- Radon certificate – possibly too specific, the recommendation should remain at a more general level: how to investigate the governance, how to change national policy to integrate radon with indoor air, how to take into account different cultures;
- Affected community: more holistic view – what is exactly affected- stakeholders should be included to define that.

3.2 Themes T3 and T4

- T3: Alignment of different decision levels: local, regional, national and international
- T4: Bridging risk assessment, risk management and risk

Recommendation EP&R 5: Develop guidelines that integrate how all stakeholders at different governance levels (including international, European) can/should be engaged. A link should be made to national EP&R plans.

Recommendation Medical 3: An active and uniform implementation in the practice of patient participation in decision making is needed.

Recommendation Medical 4: A more transparent and comprehensive support for stakeholders in managing risks-benefits considerations in medicine

Recommendation Radon 6: The radon action plan should adopt a systemic approach that considers also the governance levels between the national and the local, that are responsible for health, environment and energy issues.

Recommendation Radon 7: Develop context specific approaches for radon measurement and mitigation, at the appropriate governance level(s)

Recommendation Radon 8: Risk assessment should be accompanied by the evaluation of risk management options

EP&R

- OPEN guidelines - The guidelines should rather function as a catalogue of ideas and direction than a tick-list or dogma - they should be open to organic adaptation on the basis of stakeholder input;
- EPR5: must be clarified;
- There are already guidelines; what needs to be done is to implement at institutional level, e.g. HERCA guidelines how to engage also cross-border issues;
- The challenge is on implementation;
- What is missing has more to do with informal systems, i.e. a network bringing competence on EPR that would provide scientific information faster than provided by the political level;
- EP&R5: Some guidelines are already prepared: better reformulate to “Foster the development of guidelines”;
- It is important to have national guidelines – those who have the power to implement these need to become more conscious;
- Guidelines are needed particularly for post-accident; CRPPH is already preparing some guidelines. The question is to what extent you can prepare for remediation already in preparedness?
- What is the level of engagement we are talking about and what their impact should be on decision-making -it is not so clear;
- The problem is the practical implementation, there are guidelines, but consistency is a problem;

- ENGAGE should draw some key lessons to be considered in guidelines with regards to participation of stakeholders at different levels; it is better to focus on what is learnt from the project;
- We are talking about guidance (towards reaching a certain goal) not guidelines;
- It should be recommended to share good practices and lessons learned;
- Clarify the “why” part;
- “Minimal requirements” is judging - rephrase to “Based on the BSS, it is not always clear...”; moreover: There are (minimum, but further reaching than often implemented) requirements formulated in the Aarhus Convention and the Maastricht Guidelines. They should at least be mentioned as basis;
- Levels also relate to different emergency phases; also need to coordinate with neighbouring countries;
- Risk assessment and risk management is also relevant for EP&R;
- CONFIDENCE and TERRITORIES show that involving the different stakeholders in risk assessment and the assessment of protection strategies is very important;
- A key challenge is to be able to involve local stakeholders in risk assessment connected to risk management; develop tools or processes;
- According to BSS: information should be provided about risks near NPP’s – is this a process to include in risk management?
- Difference between preparedness and implementation of actions: we may have participation at different stages;
- What would be the goal of participation of local communities in risk management? – this needs to be discussed further.

Medical

- Generic guidance that could come from European level and provide a high level framework to be adapted –if need be- at national and local level;
- Some stakeholders are difficult to identify, to involve. Even important ones like WONCA are often unknown. And there are very different patient associations (often based on the pathology they share) and an open question is how “representative” they are;
- Need to move from informed consent (often limited to a formality, for the sake of protection against liability lawsuits) to joined decision making (true involvement of the patient in the justification process);
- Stakeholders will be motivated to come and actively participate in discussions if they feel they are really empowered, and thus have an impact on the decision making processes; resources should also be provided.

Radon

- Recommendations very general;
- What defines actually the “quality of information”?
- Involve psych and social to deal with differences, discuss when to involve patients; where are the human limits to informing people; how can we respect emotions, feelings, sensitivities, religious, cultural aspects;
- Rec 6 could be joined with Rec 4; maybe also R11;
- Rec 7: how: it should be refined, be more precise about context-specific approaches; what does it mean and how different tools can be used;

- Connecting awareness and management: The question is not only awareness, measurements but also remediation: integrated and coherent approach.

T3: Recommendations 6

- Communication is two-dimensional: horizontally between different agencies/department on the same level and vertically between the different levels (national <-> regional etc.);
- Not everybody has to know everything; knowledge has to be adapted to the needs;
- However the global problem (the problem in general) has to be understood by everybody involved;

T3: Recommendations 7

- It is not clear why national and local levels are mentioned in this recommendation, measurements and remediation are everywhere the same;
- Radon professionals should not just sell one solution, but a process of solving the problem;
- A guarantee for success is not possible, particularly for new buildings;
- The entire process should be in one hand, people should not be left alone;
- Expenses for radon protection measures might be too high for some people, governmental support might be necessary;
- However, experience shows that available money is often not used/asked for by affected people (too bureaucratic, other priorities);
- Probably radon should be regarded as a natural risk;
- The entire process of solving a radon problem should be explained to the people, also by online tools;

T4: Recommendations 8

- Radon is a long-term problem;
- Treating the radon problem there should be no difference between dwelling, work places of buildings with public access -> a global approach is needed;
- It is not clear how e.g. information campaigns can be evaluated;
- Public surveys might be biased by the fact that not all regions are affected in the same way;
- It has to be clear what exactly the aims of the risk management are;
- The final and main aim is to prevent lung cancer.

3.3 Theme T5

- T5: Role of communication, access to information, informed consent

Recommendation EP&R 6: Establish communication tools for continuous information about emergency plans, tailored towards specific stakeholders

Recommendation EP&R 7: Elaborate the extent and content of prior information based on the BSS requirements, as well as stakeholders' needs

Recommendation EP&R 8: Establish conditions for continuous feedback in EP&R

Recommendation Medical 5: Enable patients to exercise the right of informed consent in decision-making

Recommendation Medical 6: Implement an effective risk communication strategy, as component of good practice in medical exposure

Recommendation Radon 9: Make use of Internet as an opportunity for two-way communication with, and engagement of, stakeholders

Recommendation Radon 10: Develop risk communication tools in collaboration with local stakeholders

EP&R

- EP&R6: Based on input from different stakeholders, "information that is currently available is also not comprehensive, sometimes misleading and/or confusing";
- EP&R6: "Identification of relevant stakeholders has to include the recognition (among others under the Aarhus Convention and Espoo Convention) that especially nuclear power plants have to be ultra-hazardous installations, irrespective of their technical safety systems. EP&R must reflect that reality - both in plans as well as decision making structures and public participation.";
- EP&R7: mention also "... and there still consist inconsistencies between information from different authorities, especially but, not only, in transboundary situations.";
- EP&R7: IMPORTANT: transboundary situations! (related to roundtables...);
- EP&R8: Currently EP&R is only treated as a one-way process: interaction concerning how to react in an emergency. There should also be a counter-interaction taking place: conclusions about EP&R (uncertainties, difficulties, stakeholder concerns) should be moving into decisions concerning licenses and operation of nuclear installations. This does not take place. As a result, for example, the Belgian national EP&R plan has a limited first response zone that fully excludes Antwerp. This instead of translating the impossibility of needing to include part of Antwerp into the first response zone into decisions concerning acceptable risk for the Doel NPP (i.e. necessary upgrades or operation permission);
- EP&R 6, 7, 8: there should be more emphasis on 2 ways communication;
- Co-expertise: R8 should be incorporated in previous R7;
- Not only roundtables as a way to implement these recommendations, could be more ambitious;
- 2 ways communication with population in wider area;
- EPR R7: specific groups: also professionals; specific content for health professionals, etc; in France also developed in cooperation with stakeholders;
- Important: vulnerable groups;
- Once established these mechanisms – they can also include information on recovery;
- EP&R R6 and R8: set up a partnership to deliver this information; to reach health professionals should have partnerships with health professionals; co-creation and channel – also true for radon; network of partners to develop and test communication material;

- Too much info can be confusing – continuous info can be overwhelming/ ignored;
- People might be more interested about EPR after something has happened: need to be ready; local experts will emerge and have to have support;
- Local experts can be medical professionals, or professors to facilitate information, RP culture; they should be supported; probably less resource intensive than lots of information for all the public;
- High capacity machines are needed to accept millions of queries per /hour in emergency situations.

Medical

- We need to move away from informed consent -as a yes or no, liability-inspired formality- and aspire joined decision making as a truly participative process. From a one-way information to a two-ways (or more) communication. Not just “informing” but also “listening” and taking into account the patient’s opinion, choices,... (The idea of “ Not about me, without me”);
- In many cases, the patient will simply follow the doctors advise “you are the doctor, you can decide”;
- For practicability reasons (such as time constraints), we need to apply a graded approach;
- One end of the spectrum are very low dose/low risk diagnostic procedures (eg dental intra-oral radiography, radiography of a finger) on the other side are radiotherapy procedures;
- In clinical practice, we often work with “tacit consent” when it comes to low dose/low risk radiological procedures. When the referrer proposes a radiological procedure, the mere fact that the patient shows up for the appointment at the imaging department, this is seen as “consent”;
- Higher dose procedures -such as in interventional cardiology-will need to be discussed with patients (=seeking active patient engagement), also nuclear medicine procedures and certainly radiotherapy;
- In case of pediatric exposures or pregnancy, implicating patients or their representatives is more common and may even be done for lower dose exposures (plain X-ray, diagnostic CT). Another specific group may be patients with chronic conditions (such as rheumatoid disorders, Crohn’s disease, ulcerative colitis) who may require many radiological procedures over time and hence may accumulate non-negligible cumulative radiation doses: they are usually much more actively involved in any decision with regard to their follow-up;
- A crucial point in decisions on (justification of) diagnostic radiological procedures is their expected impact on further management of the patient: what difference can one reasonably expect the procedure outcome to make on the further care pathway?

Radon

T5: Recommendations 9

- It is off course important to inform people;
- Websites should be interactive -> online tools, toolboxes;
- The information should not be too general, but adapted to the needs of the individual; therefore, interactive tools are important, where people can enter their specific properties (building characteristics, buying/selling process etc.);
- Not just websites, but platforms;
- However these are difficult to maintain;
- Radon 9 – internet is a tool that can be also mentioned in Medical 6;
- The recommendation formulates in the first sentence of “why” are very ambitious aim, which might be impossible to achieve;

T5: Recommendations 10

- The recommendation mentions positive and negative aspects of maps; it is therefore not clear whether maps are recommended or not;
- It would be helpful to mention examples of other tools for the communication of risk; (no time left for more discussion on this recommendation)

3.4 Theme T7

- T7: Radiation protection cultures, including objectives, target stakeholders, content, tools, evaluation processes & Education, training and capacity building

Recommendation EP&R 9: Foster the development of RP culture during preparedness phase of emergency/post-accident situations

Recommendation EP&R 10: Reinforce education and training programmes related to RP culture for experts to be involved in preparedness and management of emergency and post-accident situation

Recommendation Medical 7: Engage initiatives to develop and promote RP culture for the health professionals who are not directly involved in medical procedure using ionizing radiations but maybe occupationally exposed and/or interacting with patients

Recommendation Medical 8: Integrate or reinforce RP culture as part of medical practices for the medical professionals who are directly involved in medical procedure using ionizing radiations

Recommendation Radon 11: Develop, disseminate and evaluate radiation protection culture from the perspective of radon as a public health issue integrated into a more global public environment and health protection approach

Recommendation Radon 12: Develop a multidisciplinary, multi-level and multi-stakeholder approach for the elaboration of RP culture dissemination actions

- RP culture recommendations have to connect and link to the other topics;
- Be more concrete in title– also specify to whom is the recommendation intended;
- Clarify if recommendation to implement some practice or to further develop;
- How to reach the good organization to be effective;
- Engagement and listening to people= part of RP expert culture.

EP&R

- EP&R9: NGO should be mentioned specifically among stakeholders. They need to be mentioned explicitly, because some authorities (e.g. in Hungary, Slovakia, Belarus, but also in other countries) do not recognise the importance of NGOs;
- EP&R9: - A holistic approach should not be used to downplay potential impacts. Every attempt to downplaying potential impacts will result in loss of communication and credibility;
- Definition of RP culture and main elements have to be included in the final report;
- Important questions are: how to develop RP culture in the preparedness phase? how to share RP culture – RP cultures?
- A key issue for the population is to get aware about issues concerning their daily life;

- Perception different radon vs. EPR; also dependent of exposure pathway; the source is also important: eg radon in mines perceived differently than indoor radon;
- Engagement is crucial; also the use local trusted actors (greater in the medical and radon fields);
- Important to see who should support the recommendations in the future: e.g. IAEA tecdoc?
- One of the central theme: experts have to listen to what stakeholders have to say and recognize that their views are valid, and that the views on what is safe are very personal and subjective; the use of the term safe is difficult.

Medical

Recommendation 7

Proposal to improve terminology and extend target audience

- Radiological practitioner (usually MD, responsible for “exposing” patient to IR) but do not forget his/her radiographers, nursing staff actively involved in the procedures;
- Referrer (because that is where decision on going for a procedure is being taken, formerly referred to as “prescriber”);
- General public, because we can all become patients at a given moment;

Education and training is crucial for ALL professionals, most difficult for referrers (although their role is crucial: justification of procedures!)

- For all of them, time that can be devoted to E&T is limited: rather a few hours than a few 10’s!
- Content should be practice-oriented, not radiation physics! The content can be agreed upon beforehand in a discussion between authorities (RP, Health, Education) and professional/scientific societies;
- Not a single shot, continuous E&T, life-long learning;
- Preferably not isolate out RP, but integrate it when discussing care processes for clinical entities (eg headache, low back pain,) as one of the things to consider. This approach is crucial for referrers, which in practice need to follow very regular E&T programmes on a number of items: authorities responsible for RP should make sure that RP is included when medical imaging or therapy are touched upon.
- For professionals, the role of the hospital director (who is the “licence holder”) is to allot necessary time and funds for E&T of his employers, and make sure the independent workers working in his institution fulfil the necessary E&T needs.

Good examples of initiatives exist, they could be highly inspirational, or can be used as such or adapted to local needs

- Example of HERCA campaign for referrers;
- Example of Belgian, French campaigns for awareness creation in the general public

Recommendation 8

One of the best ways to evaluate is to include RP in clinical audits (RP competent authorities should make sure it is!). Audits are mandatory in medicine, also because of EU BSS directive requirements.

Examples exist on how this can be done, for instance IAEA has developed handbooks for external (and extensive!) auditing eg “Quadrill” for radiology, but similar documents are available for nuclear medicine and radiotherapy.

It may be advisable to start with limited internal audits (such as one proposed by European Society for Radiology for radiology department) to get professionals used to the process of critically looking at what they are doing, as a multidisciplinary team (in a radiology department, that involves not only radiologists and radiographers, nurses, but also referrers (GP's, organ specialists) and even including reception desk personnel (who deal with appointments and provision of preliminary information).

When implementing an audit system in a country (an obligation for authorities), an audit which necessarily looks at RP explicitly, professionals should be included in accepting/creating/adapting it to be compatible with local needs/culture/habits. (eg Belgian adapted version of IAEA's Quadrill, "Be-quadrill").

Radon

T7: Recommendations 11&12

- If the population is regarded as stakeholder recommendations 11 and 12 can be merged;
- The recommendations focus too strongly only on radon; radon should be treated in a broader sense -> indoor air quality, energy efficiency etc.
- Only measure if you have solutions afterwards;
- Experts should be trained before planning measurement campaigns;
- Radon risk should be related to other (natural or environmental) risks;
- Again: how can the efficiency of information campaigns be measured?
- The development of RP culture for radon alone is not necessary;
- But RP culture should be part of all activities in the context of radon activities;
- One should start by talking about indoor air quality and then radon as part of it and not the other way around;
- Local elected representatives are very important in disseminating radon information;
- The way risk is explained to the public has to be developed -> risk communication;

4 Conclusions

The findings and draft recommendations presented at the workshop, as well as the posters dedicated to particular case studies analysed within the ENGAGE work packages, provided a good basis for discussions in working groups dedicated to the three fields: medical exposures to ionizing radiation, emergency and post-accident exposures, and exposure to indoor radon.

The workshop programme and its interactive structure provided conditions for reflection on the fulfilment of the ENGAGE project objectives, namely to i) answer the questions why, when and how are stakeholders engaged in radiation protection issues; ii) develop novel approaches to analysing stakeholder interaction and engagement; iii) investigate processes for enhancing radiation protection culture and their role in facilitating stakeholder engagement; and iv) provide recommendations and build a knowledge base for stakeholder engagement in radiation protection.

The workshop provided opportunities to share views and experiences from a the wide range of stakeholders participating to the workshop, in view of enhanced governance of radiological risks for improved radiation protection and informed decision making. It contributed to the synthesis of the results of WP1, WP2 and WP3 and provided feedback on the draft recommendations, which will be finalised based on the workshop outputs. A detailed analysis and description of ENGAGE recommendations will be the subject of the final synthesis report which is under development within WP4 Task 4.1 and will be issued in November 2019.

Annex 1: Workshop programme

11 September 2019

12:00 – 13:30 **Registration and lunch**

13:30 – 14:00 **Welcome address**

Branislav Hatala and Tatiana Duranova, VUJE
CONCERT project, Sylvie Charron, IRSN
ENGAGE coordinator, Catrinel Turcanu, SCK•CEN

14:00-14:10 **Organisation and format of the workshop**

Tatiana Duranova, VUJE

14:10 – 14:30 **ENGAGE Project overview**

Catrinel Turcanu, SCK•CEN

OVERVIEW OF CONTEXT, WORKING METHODOLOGY, STUDIES, FINDINGS

14:30 – 15:00 **Complexity of stakeholder engagement and themes identified:**

Particular topics and transversal issues

Bieke Abelshausen, SCK•CEN

15:00 – 15:45 **Medical exposures to ionizing radiation**

Marie-Claire Cantone, University of Milan

15:45 – 16:00 **Coffee**

16:00 – 16:45 **Emergency preparedness and response, post-accident exposures**

Nadja Zeleznik, EIMV

16:45 - 17:30 **Exposure to indoor radon**

Christiane Pözl-Viol, BfS

17:30 - 18:30 **Poster session**

18:30 **Welcome drink**

12 September 2019

PRESENTATION OF MAIN FINDINGS AND DRAFT RECOMMENDATIONS, ILLUSTRATION WITH CASE STUDIES, ROUND TABLE DISCUSSIONS

08:45 – 10:30 **Working session**

- T1: The conditions for meaningful participation and commitment of institutional and non-institutional stakeholders (*Presenter: Bieke Abelshausen, SCK•CEN*)
- T2: Broadening the scope of 'participation' in radiation protection (beyond formal institutional approaches, new actors) (*Presenter: Nadja Zeleznik, EIMV*)
- Feedback from rapporteurs

10:30 – 11:00 **Coffee**

11:00 – 12:30 Working session

- T3: Alignment of different decision levels: local, regional, national and international (*Presenter: Catrinel Turcanu, SCK•CEN*)
- T4: Bridging risk assessment, risk management and risk communication approaches and stakeholders (*Presenter: Christiane Pözl-Viol, BfS*)
- Feedback from rapporteurs

12:30 – 13:30 Lunch

13:30-14:30 Panel discussion on themes T1, T2, T3, T4

Igor Gogora, local community Kalna nad Hronom (excused)

Jean-François Lecomte, IRSN

Ted Lazo, OECD-NEA

Azby Brown, SAFECAST

Anne Nisbet, Public Health England

Jan Haverkamp, Greenpeace

Moderator: Robbe Geysmans, SCK•CEN

14:30 – 16:00 **Working session**

- T5: Role of communication, access to information, informed consent (*Presenter: Marie Claire Cantone, University of Milan*);
- T6: Ethical aspects of stakeholder engagement (*Presenter: Gaston Meskens, SCK•CEN, and Liudmila Liutsko, ISGlobal*)
- Feedback from rapporteurs

16:00 – 16:30 **Coffee**

16:30 – 17:30 Panel discussion on themes T5, T6

Miroslav Pinak, IAEA

Philipp Trueb, FOPH (Federal Office of Public Health, Switzerland)

Deborah Oughton, NMBU (Nowegian University for Life Sciences)

Ernesto Mola, WONCA (World Organization of Family Doctors)

Lodewijk Van Bladel, FANC/AFCN (Federal Agency for Nuclear Control, Belgium)

Moderator: Gaston Meskens, SCK•CEN

17:30-17:40 Future research in view of ENGAGE project results

Klaus Bacher, EURAMED and EFOMP (excused)

17:40 – 18:30 Poster session

19:30 **Workshop dinner**

13 September 2019

PRESENTATION OF MAIN FINDINGS AND DRAFT RECOMMENDATIONS, ILLUSTRATION WITH CASE STUDIES, ROUND TABLE DISCUSSIONS

08:45 – 10:15 Working session

- T7: Radiation protection cultures, including objectives, target stakeholders, content, tools, evaluation processes & Education, training and capacity building (*Presenter: Caroline Schieber, CEPN*)
- Feedback from rapporteurs

10:15-11:00 Panel discussion on theme T7

Sergio Salerna, Policlinico Università Palermo
Carine Vrel, DREAL Bourgogne-Franche-Comté
Horst Monken-Fernandes, IAEA
Eduardo Gallego, Polytechnic University of Madrid

Moderator: Robbe Geysmans, SCK•CEN

11:00 – 11:30 Coffee

11:30 – 12:15 Future research in view of ENGAGE project results

Future research needs identified within ENGAGE- Catrinel Turcanu
Radiation protection platforms SRA's
Peter Mihok, SHARE
Thierry Schneider, NERIS
Rodolphe Gilbin, ALLIANCE
Veronika Olsovcová , EURADOS

12:15 – 12:30 Reflection on ENGAGE project objectives fulfilment

Catrinel Turcanu, SCK•CEN , and all participants

12:30 – 13:30 Lunch, adjourn

Annex 2 List of participants

No	Last name	First name	Country	Organisation
1	ABELSHAUSEN	Bieke	Belgium	SCK-CEN
2	BARATOVA	Dana	Slovakia	NJF
3	BARAZZA	Fabio	Switzerland	Federal Office of Public Health
4	BROWN	Azby	Japan	SAFECAS
5	CANTONE	Marie Claire	Italy	University of Milan
6	CIHAKOVA	Pavlina	Czech Republic	SUJB
7	DURANOVA	Tatiana	Slovakia	VUJE
8	GALLEGO	Eduardo	Spain	UPM
9	GERING	Florian	Germany	BfS
10	GEYSMANS	Robbe	Belgium	SCKCEN
11	GILBIN	Rodolphe	France	IRSN
12	GOYETTE PERNOT	Joëlle	Switzerland	School of Engineering and Architecture of Fribourg
13	GSCHWIND	REGINE	France	Université de Franche-Comté
14	HAVERKAMP	Jan	Netherlands	Greenpeace / Nuclear Transparency Watch
15	HIMMELBAUER	Klara	Austria	AGES
16	HOLKOVÁ	Dominika	Slovakia	VUJE
17	CHARRON	Sylvie	France	IRSN
18	JAUNET	Pierrick	France	ASN
19	KOVER	Miroslav	Slovakia	NJF
20	LAZO	Edward	France	OECD Nuclear Energy Agency
21	LECOMTE	Jean-Francois	France	IRSN
22	LIUTSKO	Liudmila	Spain	ISGlobal
23	MELICHEROVA	Terezia	Slovakia	Slovak Institute of Hydrometeorology
24	MESKENS	Gaston	Belgium	SCK-CEN
25	MIHOK	Peter	Slovakia	Matej Bel University in Banská Bystrica
26	MOLA	Ernesto	Italy	WONCA Europe
27	MONKEN-FERNANDES	Horst	Austria	IAEA
28	MURITH	Christophe	Switzerland	mSv Consulting
29	NISBET	Anne	United Kingdom	Public Health England
30	OLSOVCOVA	Veronika	Czech Republic	EURADOS FZU AV
31	OUGHTON	Deborah	Norway	CERAD

32	PINAK	Miroslav	Slovakia	IAEA
33	PLOTNARKOVA	Jana	Czech Republic	SUJB
34	PÖLZL-VIOL	Christiane	Germany	BfS
35	ROSI	Antonella	Italy	Istituto Superiore di sanità
36	SALERNO	Sergio	Italy	Policlinico Università Palermo
37	SAVU	Diana	Romania	IFIN
38	SCHIEBER	Caroline	France	CEPN
39	SCHNEIDER	Thierry	France	CEPN
40	TAFILI	Vasiliki	Greece	EEAE
41	THOMAS	Gareth	United Kingdom	ONR
42	TRUEB	Philipp	Switzerland	FOPH
43	TURCANU	Catrinel	Belgium	SCK-CEN
44	VAN BLADEL	Lodewijk	Belgium	FANC-AFCN
45	VREL	Carine	France	DREAL Bourgogne-Franche-Comté
46	ZELEZNIK	Nadja	Slovenia	EIMV