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Communication recommendation related to IR

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Project in short

<http://eagle.sckcen.be>

Education, training and information to the general public are key factors in the governance of ionizing radiation risks. Communication about ionizing radiation with the general public has to be further improved, as highlighted also by the 2011 nuclear accident in Japan. An effort is needed to analyze the state of the art and the existing needs in education, training and information, and to coordinate the information and communication about ionizing radiation at European level. This was the objective sought by the EURATOM call Fission-2013-6.0.2: Education / training / information towards the public. The selected project was entitled **EAGLE (Enhancing educAtion, trainiNG and communication processes for informed behaviors and decision-making reLatEd to ionizing radiation risks)**, and it was active 2013-2016.

The project set out to identify and disseminate good practices in information and communication processes related to ionizing radiation. For this purpose, the consortium reviewed national and international data, tools and methods as well as institutional work in order to identify education, information and communication needs and coordination possibilities at European level. The lessons learned from the nuclear accident in Fukushima also provided valuable input. The main goal of the project was to enhance public understanding of ionizing radiation and to facilitate a coordinated communication approach.

Moreover, EAGLE fostered a move towards the ideal of citizen-centered communication, including a participative component. The project brought together representatives of nuclear actors, users of ionizing radiation, authorities, mass and social media, and informed civil society. The project website contains the scientific reports and records of many rich interactions: <http://eagle.sckcen.be/en/Deliverables>

More information can be obtained from the coordinator of the project Mrs. Tanja Perko, tperko@SCKCEN.be, SCK•CEN.

The composition of the EAGLE grant consortium is as follows:

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Partner 2: ARAO - Agencija za Radioaktivne Odpadke

Partner 3 : IRSN - Institut de Radioprotection et de Sûreté Nucleaire

Partner 4: Regia Autonoma pentru Activitati Nucleare Drobeta tr. Severin ra Sucursala Cercetari Nucleare Pitesti - INR

Partner 5: Institut Symlog

Partner 6: Institut Jozef Stefan

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List of Acronyms

AB – Advisory Board

EAGLE – Enhancing education, training, communication processes for informed behaviours and decision making related ionizing radiation risk

ETI – Education, Training, Information

IR – ionizing radiation

SSH – Social Sciences and Humanities

SRA – Strategic Research Agenda

Executive summary

This final deliverable of EAGLE WP4 includes recommendations intended to **help European actors in the field of ionizing radiation to move closer to a citizen-centered communication process, supporting better informed decision-making about ionizing radiation risks.**

These recommendations are formulated based on results from the EAGLE activities conducted throughout the entire project duration. They integrate EAGLE stakeholders' feedback and have been agreed by the EAGLE stakeholders, including the EAGLE advisory board. In addition, most of the work was peer-reviewed and published in different scientific journals. The recommendations will be published in a special booklet shortly after the end of the EAGLE project.

The recommendations are mostly addressed to source institutions (official communicators), and thereby reflect a *standard of quality* that other communication actors—media and civil society representatives—can ask for.

In addition, EAGLE and its stakeholders recognized the need for establishing a European Platform for the integration of Social Sciences and Humanities in research related to Ionising Radiation in order to assist in responsible research and innovation in the field of ionizing radiation and, in this way, contribute to improved ionizing radiation risk governance. The EAGLE partners and stakeholders will continue the work towards establishment of the Platform after the EAGLE project and hope to receive support in this from the EC.

EAGLE consortium members would like to thank Advisory Board members, the EAGLE stakeholders, the participants to media workshops, citizens' dialogues and pilot studies, teachers, radiation protection and other experts, as well as the participants to the RICOMET conferences, for their attendance and valuable input. We thank to the editorial board of Journal of Radiological Protection to publish a special section related to the EAGLE results presented at the RICOMET 2015 conference and open these scientific article for public access.

1. Introduction

Education, training and information to the general public are key factors in the governance of ionising radiation risks which includes different nuclear energy program applications in the nuclear fuel cycle, other nuclear applications like medicine, industry, research and food industry, but also natural radioactivity like NORM and radon. Communication about ionising radiation with the general public includes information dissemination as well as methods and tools for two-way communication. Those methods have been improved lately based on the good practices and new approaches in some countries across the world, especially related to the radioactive waste management activities. But the Fukushima Daiichi accident in 2011 demonstrated again the communication needs to be further improved. The EAGLE project aimed specifically at coordinating the information and communication strategies related to ionising radiation for the general public, in order to get a better understanding of the effects of ionising radiation, taking also into consideration the lessons learnt from the 2011 accident in Fukushima (Japan).

During the EAGLE project many activities took place including participation of different project stakeholders (project partners, member of Stakeholders consultation group, representatives of information sources, media and civil society). The main goal of this interactions was to obtain the information, opinions and suggestions how the communication on ionizing radiation could be improved. Also deliverables within EAGLE project addressed this important issue and provide some recommendations for improved communication on ionizing radiation from different perspective involving those who provide most of the information (like professionals, regulatory authorities, nuclear expert organisations, medicine representatives, nuclear power industry, ...), journalists (from classical media to the social media experts) and different representatives from public (like municipalities with nuclear facilities, NGOs, civil society organisations, ...).

In this report the recommendations from all activities in the EAGLE project are summarised and presented. They are grounded on the written evidences (either as deliverables in the project or as other outputs like presentations at different events and scientific papers) or oral contributions from events. They form bases for future activities, research and implementation actions. Many of those recommendations are quite well known and even supported by scientific articles and papers. But there is still a big challenge how to really, effectively and efficiently communicate the ionizing radiation and related risks to the public.

As a proceeding from the International conference RICOMET 2015, fourteen interesting papers were published in peer-re-viewed [Journal of Radiological Protection, Volume 36, Number 2](#). All of them are with active hyperlink listed as an annex to this document.

2. Recommendations

2.1 Communication recommendations related to mass media and social media in order to move towards mutual understanding

“The media can serve but never replace direct communication with interested publics. Media articles also will never be able to reasonably answer all questions and there need to be multiple points and sources of information that the public can reach out to.”

(From EAGLE deliverable 2.5)

Communication recommendations related to traditional mass media and social media were developed together with institutions (information sources) in nuclear and non-nuclear Member States whose mission includes interaction with the media (information transmitters), with journalists, editors and with expert practitioners in social media. The focus in dialogues, workshops and round table discussions was on how sources provide information about ionizing radiation applications and risks, and how this reaches the public in actual articles or other media products. They also considered more broadly the multi-directional societal communication process.

As a result, the following recommendations were formulated:

R1 Develop 'risk culture' throughout society to provide a solid basis for communicating about ionizing radiation risks. Risk culture means that people are aware of the existence of risks but also, of preventive and protective actions that are taken by the authorities, or that people themselves can take in some cases.

R2 Establish a more regular channel of communication on ionizing radiation risks rather than one that is concentrated on crisis reporting. This means organizing more regular exchanges between sources and the media. Networks and more elaborate structures and multiple partnerships can be built to establish trust over time. These channels can then be turned to in case of emergency.

R3 Engage in ongoing dialogue among the professionals involved in communicating ionizing radiation risks. Officials, specialists of radiological protection and nuclear safety and media professionals who participated in EAGLE want a continuing exchange and learning platform in the interest of building solid relationships, risk culture and public understanding.

B. Process of communication

R4 Adapt information delivery to the needs of the media. Journalists need rapid, clear responses from source institutions. Scientists and experts working at the source institutions must be trained to meet these needs. Bureaucratic obstacles should be lifted.

R5 Develop relationships with journalists through training and joint learning events. There are many ways to develop relationships and build respective competence: technical seminars, press trips, open door visits, and support for joint participation by journalists and sources in third party activities.

R6 Provide radiological protection trainings for journalists. Specific training – if possible including a simulation – will improve the protection of journalists themselves when reporting about radiological events (e.g. explosion of a radiological dispersal device), mutual understanding between journalists and emergency management, understanding of ionizing radiation concepts by journalists, and quality of information transfer in such events.

R7 Design press conferences and other media events to bring up the standard of reporting on complex IRR topics. Source institutions can organize press conferences and other media events in a way that maximizes understanding of the complexity of the topic, the dialogue between sources and journalists, and the quality of resulting reporting.

R8 Get to know the public's needs and perceptions. Up-to-date knowledge about public needs and perceptions, and also how people receive and understand information, should be checked as a first step in public communication.

R9 Develop direct ongoing communication with the public, on IRR and other risks, in many voices. For this, all available mass media and social media channels should be actively employed as well as live, face-to-face events. Create open and direct discussions during crisis and non-crisis periods, where members of the public can ask their questions.

R10 Participate in networks with active, empowered citizen communicators. A new type of public is emerging: citizens who are active partners in communication as well as recipients. Sources can help build competence by entering the new discussion networks and forming partnerships.

R11 Contribute to the foundations of risk knowledge in the schools. The public should be given a better basis to understand IRR issues. This means developing risk culture already at the level of schooling. Sources should invest in programs targeting children and educators.

C. Ethical aspects

R12 Respect the different perspectives, needs, and roles of participants in the communication process. Source institutions, media, civil society organizations, and stakeholders in the general public have different concerns and are responding to different pressures. Find out what the other communication partners need to know and how they can best receive information and help from the source.

R13 Deliver information that helps people make a better-informed decision in their situation (don't pre-define the risk as acceptable for them or not; similarly, do not misuse inclusive public risk communication as covert industry promotion). A dialogue can take place about the different value assigned by different stakeholders to the benefits and costs associated with IR applications, with resulting planned or accidental exposures. It is an opportunity to pass on knowledge about IRR, and to develop risk culture – including safety culture among those applying IR.

R14 Admit that a nuclear accident can happen. When sources including government, authorities, and industry admit the basic fact that nuclear accident is a possibility, this similarly opens the way to dialogue and strengthens safety and risk culture on all sides.

R15 Admit scientific uncertainties related to health effects of ionizing radiation. Ionizing radiation exposures, especially low doses, are linked to high uncertainties as to health effects, modeling etc. Experts are not speaking with one voice on these issues. It is important to present balanced information showing the areas of doubt and uncertainties.

D. Institutional and organizational aspects

R19 Adapt public information on ionizing radiation risks to everyday life and observed needs of citizens. Communicators need to go out to the public to learn what the actual (potential) impacts of IR risks are. Information should be adapted to different societal groups (media professionals, general public, children...) and give examples of questions that could be asked by people to help fit the information to different decisions they must make.

R20 When delivering information about IRR, especially in times of crisis, be affirmative and responsive (not tentative and prudent). Be prepared to come out very fast with information to serve the media's need to be quick and reactive. Start by stating the important take-away message. Thoughtfully communicating uncertainty and "what we don't know" can come next.

R21 Translate and clarify content. Simplify, use metaphor, comparison, and familiar reference points setting information into context (without trivializing risk, or comparing involuntary risk with dangers that people face by their own choice). Help the public understand the meaning of legal radiological limits, and communicate even on doubt and uncertainty.

R22 Provide materials that suit media needs. Keep the institutional website and social media accounts up to date with useful resources clearly labeled for journalists, including media kits, newsletters and infographics. Offer narrative so that media can tell a story. Be aware of citizen journalism and support it in the same ways.

E. Channels

R23 Create and support online banks of information that journalists and other stakeholders can consult. These can be integrated with seminar events. Online content can be supplied with a "free to use" license so that journalists but also bloggers, civil society organizations, teachers, children can obtain easy to understand materials (such as video animations, infographics, photos) as well as links to relevant experts and opinion makers. An integrated model for an IRR information resource combines online and face-to-face components.

R24 Television is a major IRR information channel for most Europeans, so source institutions should cooperate in the production of news and documentaries. Only a real collaboration between sources and media may produce a high standard of IRR information in documentary news, full-length documentaries, TV shows, etc. Sources should enter into collaboration with the various expert professionals and appropriately offer content and financial aid.

R25 Consider different types of spokespersons and mediators appropriate for your context. In some countries journalists prefer to deal with source spokespersons or press officers; elsewhere, they prefer to be placed into direct relation with experts, who should be trained to speak to the media. The source institution should also develop the ability to communicate directly with the public, for instance through social media. Trained "science mediators" translate, popularize and perform scientific outreach.

R26 Introduce social media channels through traditional communication campaigns. Traditional time-limited communication campaigns engage publics and can introduce social media channels which interested people can use to stay in touch, continue discussion, and become in turn a communication channel that can redistribute source's content.

R27 Become part of relevant social media communities. Engage in conversations and discussions, identify and maintain contact with relevant influencers, nourish your networks and persevere.

R28 Foster multiple sources, a plurality of voices considering the issues and speaking to the public. Support citizen science and citizen journalism, and facilitate the activity of civil society organizations responding to citizen needs "on the ground". Whether part of organizations or acting independently, civil society volunteers are engaged persons, they render a service to their fellow citizens and can act as channels between authorities and the population – in both directions. Sources can be responsive to them, engage and support them with information, material resources, public-interest partnerships and events, including barcamps, hackathons, and other crowd-sourced endeavors.

Recommendations are supported by the following EAGLE online resources published at <http://eagle.sckcen.be/en/Deliverables>:

EAGLE Deliverable D2.5 Outcome of EAGLE dialogues: Agreed recommendations and guidelines on developing media relations for ionizing radiation communication. This report presents recommendations that should help European actors in their media communication, particularly sources, to move closer to a mutual understanding and a citizen-cantered communication process, supporting better informed decision-making about ionizing radiation risks (IRR).

EAGLE Deliverable D2.5 Annex: Full country reports of EAGLE national-level media dialogue workshops. Here are the analytic minutes of the encounters in France, Poland, Romania and Slovenia.

EAGLE Deliverable D2.1 Overview of mass and social media treatment of IR topics, including in the aftermath of Fukushima. An intensive preparation activity by WP2 researchers was to review how source institutions and media actually behave in communicating about IR events and risks. This deliverable includes critical analysis of published studies, and guidance from EAGLE's social media expert.

A peer-reviewed article online at <http://dx.doi.org/10.4172/2165-7912.1000252>:

Perko T, Mays C, Valuch J, Nagy A (2015) **Mass and New Media: Review of Framing, Treatment and Sources in Reporting on Fukushima.** J Mass Communicat Journalism 5:4.

Grounding on the EAGLE D2.1 report, this peer-reviewed article identifies how traditional mass media in Japan, North America and European countries reported about the Fukushima nuclear accident and how the new media also were engaged in communications. The article uses data from published scientific studies and original EAGLE field data collected by questionnaire from source institutions.

A peer-reviewed article online at <http://dx.doi.org/10.1088/0952-4746/36/2/S143>:

Mays C, Valůch J, Perko T, Daris I, Condi C, Miśkiewicz A, Zakrzewska G, Constantin M, Diaconu D, Kralj M, Železnik N (2016) **Looking for citizen-centered communication: dialogues between radiological protection or nuclear safety specialists and media professionals.** J. Radiol. Prot. 36 S143. This peer-reviewed article refines the cross-national analysis of D2.1 to deliver insight on how source institutions can improve their communication behavior and foster the development of a broadly shared "risk culture" in the public.

2.2 Communication recommendations related to information sources in order to improve the education, training and information (ETI) material and activities about the effects of IR

“Information sources are fully aware of the need for good communication with stakeholders, with the general public or civil society in particular. However, a lot needs still to be done to reach a mutual understanding, respect, acceptance and confidence on the side of information sources and information recipients.”

(From EAGLE deliverable 1.3)

Recommendations related to education, training and information (ETI) materials and activities were collected by number of EAGLE activities with the representatives of public and private institutions that communicate about the ionizing radiation, its risks, and radiation protection issues in EU member states. A broad overview of communication practices regarding ionizing radiation, the risks of its application and nuclear accidents (Fukushima case), was carried out by EAGLE with the help of many information sources from nuclear power plants, governmental institutions, regulatory bodies, technical support organizations, universities etc. in EU member states.

Information sources were divided into two basic groups that can be collectively called “nuclear industry, regulators and policy makers” and “medical institutions”.

As a result, the following recommendations were formulated:

R1: It is not advisable to prepare the ETI materials and activities on a common template in all EU member states.

R2: ETI materials and activities should be prepared for specific target publics (e.g. students, local population, politicians, journalists, teachers ...) and should respond to their interests and needs.

R3: ETI materials and activities should be regularly reviewed and adapted according to feedback from the target public. Preparation of the materials together with the public is very beneficial.

R4: ETI materials like leaflets, video-clips, annual reports, webpages, blogs, TV and radio broadcasts etc. are valuable but not sufficient communication tools; science-to-citizens approach and open discussions about facts and fears should be promoted as an efficient tool for communication about ionizing radiation.

R5: Employ internet-mediated encounters (e.g. webinar, online forum, platforms...) in order to enhance interaction with different groups of the population. Actively participate on a social media landscape.

R6: ETI materials and activities should communicate facts, not opinions, in order to empower the citizens to take informed decisions but not to dictate their decision.

R7: Information sources should consider and implement role division, and define the responsibility of information sources, educational system, media, policy makers etc.

R8: ETI materials and activities should support teachers' work but duplicating their work should be avoided.

R9: Information sources should show and explain what they are doing and what are the health and environmental risks from their activities. Justification of radiation activities must be presented to the public.

R10: The impacts of using the ionizing radiation should be put in the context of exposure to natural background radiation.

R11: Risks of using ionizing radiation in defined situations should be clearly described and the distinction between the risk and the actual danger in emergency situations should be explained.

R12: ETI materials and activities should address radiological protection aspects in parallel with nuclear safety issues.

R13: Radiation risks and radiation safety issues should be balanced and preferably presented together.

R14: Institutional communication culture should be constantly adapting to the actual communication landscape in order to support and facilitate all routine and emergency communication activities.

R15: Engagement in the ongoing dialogue among the professionals and public should be a routine procedure.

R16: Contribute to citizens' science projects by organizing or promoting projects about ionizing radiation, sharing information and verifying collected information.

R17: Support science correspondents by offering education and training related to IR topics including emergencies. In addition, some funds for scholars could be established in order to encourage knowledge gathering in a journalistic population.

R18: Establish "Science Media Centers" as a centralized scientific data service for journalists. Sources can foster this type of resource by becoming dues-paying members and by contributing information and expertise. Similar "Science Education Centers" can be established for teachers.

Recommendations are supported by the following EAGLE online resources published at <http://eagle.sckcen.be/en/Deliverables>:

EAGLE Deliverable D1.3 Guide for improvement of solutions for good practices and coordination for IR information sources. This report from EAGLE WP1 focuses on institutional sources, their materials and practices. It contains recommendations which harmonize with those generated by WP2.

EAGLE Deliverable D1.2 Analyses of ETI material in EU related to Fukushima accident. This report from EAGLE WP1 analyses different public materials related to ionizing radiation collected from different sources, such as nuclear power plants, medical institutions, regulatory organisations, waste management organisations and technical support organisations. In addition, it reports the results of a survey related to communication applied to different information sources in EU countries.

2.3 Recommendations related to communication with members of general public and informed civil society in order to support informed decision-making about IR

“Among the factors of trust building, empathy and care contribute essentially, prevailing over honesty and openness, commitment and dedication, and even competence and experience. People’s perception that the communicator cares about their fears and concerns counts enormously especially when the topic at hand is not very familiar.”

(From EAGLE deliverable 3.3)

Recommendations related to communication with members of general publics and informed civil society were developed by using public opinion surveys, in-depth interviews, mental models, group dialogues, pilot actions (tests about understanding of communication material) and national and international workshops. Most of the results were verified by peer reviewers outside of the EAGLE project and stakeholders - by social science and humanities scientific journals and published in different scientific articles.

As a result, the following recommendations were formulated:

R1 The EUROBAROMETER survey should continue to address questions regarding the use of ionizing radiations and their potential risks in order to capture current population’s needs, changes and trends in the people perceptions. Based on this information, institutional sources, mass media, and all relevant decision makers can adapt their communication content in order to answer these needs.

R3 Availability of information for the whole population, at any time, using a large diversity of means and opportunities for the education and training should be a priority of the sources’ communication program. Scientific Museums, Science media communication, social media, scientific documentaries are only few ideas in this regards.

R4 Build confidence and maintain it during normal situation in order to use it during crisis should be the main strategic objective of any communicator (institutional source, waste organisation, nuclear power plant operator, journalists). It takes time, it needs proves and has to be continuously alive. It has to be based on professionalism, transparency and honesty.

R5 Risk communication in modern society should be seen as an important form of stakeholder engagement, based on dialogue and two-way communication rather than a simple provision of information. Communication has to be more than just an education and/or marketing process. it should be part of a real engagement with the public for a mutual understanding of reasons, benefits and risks, no matter what IR application is

approached. Communication about IR should correctly balance the benefits and risks, and its content should be adapted to the target audience in order to be 100% accessible.

R6 Knowledge-based society requires involvement of citizens at a large scale, including local communities, teachers, students, mothers, volunteers, etc.

R7 Continuous collaboration of mass media with institutional sources and scientists should create those links which can be immediately accessed during crisis for an efficient communication and information of the population.

R8 Early engagement of relevant stakeholders should be a formal part of the early planning of any activity related to ionizing radiation.

R9 Stakeholder engagement has to be an integral part of a decision-making.

R10 Mutual learning and transparency among all stakeholders, including scientists and lay people, is vital. A technocratic approach, where 'experts know best and can decide for the people who do not understand the technical issues' should be switched to a socio-centric communication based on public participation with which the gaps between experts and stakeholders can be bridged.

R11 Citizen Initiatives and engagement opportunities should be created.

R12 A trans-disciplinary approach in risk communication (collaboration with natural science, social sciences and humanities) is important in order to develop appropriate, responsible and value based risk communication.

R13 More opportunities for dialogue among natural scientists, researchers in social sciences and humanities, civil society organisations, and other stakeholders, such as provided by the RICOMET conference, should be created.

R14 In order to better focus ionizing radiation research, interactions with, and experience exchange among platforms and projects, are essential.

R15 The converging values and differences among the different groups of stakeholders should be identified.

R16 To enhance and promote SSH research in the field of ionising radiation protection, and to maintain and share the specific knowledge and expertise developed so far, a need was expressed for the establishment of: SSH research within the Strategic Research Agenda of technical radiological protection platform; and SSH networking activities. These should be self-sustainable after the completion of the projects participating at the RICOMET

conference.

Recommendations are supported by the following EAGLE online resources published at <http://eagle.sckcen.be/en/Deliverables>:

EAGLE Deliverable D3.1 Report on public views across EU on education and information in the post-Fukushima context. Extensive surveys of the general public were conducted in the EAGLE countries; this 2014 report by C. Turcanu et al. summarizes the findings, and detailed country reports are found adjacent to this deliverable in the EAGLE online repository.

In the peer-reviewed articles:

TURCANU, C., EL JAMMAL, M. H., T., P., BAUMONT, G., LATRÉ, E. & CHOFFEL DE WITTE, I. (2016) **Satisfaction with information about ionising radiation: a comparative study in Belgium and France.** Journal of Radiological Protection, 36, 122–142.

PERKO, T., RASKOB, W. & JOURDAIN, J. R. (2016) **Improved communication, understanding of risk perception and ethics related to ionising radiation.** Journal of Radiological Protection, 36, 15–22.

ŽELEZNIK, N., CONSTANTIN, M., SCHNEIDER, N., MAYS, C., ZAKRZEWSKA, G. & DIACONU, D. (2015) **Lay public mental models of ionizing radiation.** Nuclear Inzenering International

Nadja Železnik, Marin Constantin, Nina Schneider, Claire Mays, Grazyna Zakrzewska and Daniela Diaconu (2016) **Lay public mental models of ionizing radiation: representations and risk perception in four European countries** Journal of Radiological Protection, 36.

2.4 Recommendations related to research in the field of communication

R1 Support a transdisciplinary research and development of nuclear technologies and applications.

The EAGLE project results highlighted that areas such as medical, industrial and nuclear energy applications of ionising radiation research and development, as well as emergency management and rehabilitation, can undoubtedly benefit from the social sciences and humanities. This includes, among other aspects, enabling stakeholders to be involved in nuclear research policy. Shaping research and development pathways in socially desirable ways implies trans-disciplinary methodological approaches and activities to build strong societal justification.

The public declarations, published after the RICOMET 2015 and RICOMET 2016 conferences (<http://ricomet2016.sckcen.be/en> and <http://ricomet2015.sckcen.be/en>), appeal for implementation of responsible innovation in nuclear research and development with activities to promote the further integration of social sciences and humanities. The appeal resonates with the spirit of the European Research Area (ERA). In the working document *Science, society and the citizen in Europe*, emphasizing the “growing scepticism” and

“hostility” of society towards advances in knowledge and technology, the European Commission argues that the relationships between science, technology and society “have to change because of the impact of science and research on competitiveness, growth and jobs and on the quality of life in Europe”. In the more specific context of the Framework Programmes, the European Commission states that “for Europe to become the most advanced knowledge society in the world, it is imperative that legitimate societal concerns and needs concerning science and technology development are taken on board” (Work Programme 2007, Capacities, Part 5, Science in Society).

Addressing the social, ethical and participatory dimensions of nuclear research and development offers great opportunities for the development of trans-disciplinary projects in the nuclear field and collaborations with partners from multiple disciplines that embrace a range of issues, dimensions and expertise. Such research and development, including what is commonly called 'governance' aspects, allows researchers from related fields of nuclear technology, radiological protection, safety and emergency response to assume their responsibility towards European society by responding to the expectations of both the authorities and the public.

R2 Establishment of the European Platform for the integration of Social Sciences and Humanities (SSH) in research related to Ionising Radiation (IR). The mission of the SSH IR Platform is to integrate social sciences and humanities (SSH) in research, practice and policy related to ionizing radiation exposure situations (e.g. low dose risk, radioecology, emergency preparedness and response, dosimetry, medical applications, radioactive waste management, nuclear energy production, NORM, site remediation etc.), stimulating the interaction of relevant actors in order to reach a shared vision. To this end, the platform will structure and enhance dialogue at the EU level among the different stakeholders, fostering the sharing of knowledge and information among various disciplines related to ionizing radiation. The SSH IR platform will elaborate a Strategic Research Agenda (SRA) based on the principles of trans-disciplinarily and inclusiveness, defining research directions and priorities for SSH and for the integration of SSH with natural sciences and technology for better policy and practice related to ionising radiation exposure situations. This SSH IR SRA will be developed in coordination with the existing platforms in the field. Therefore, the SRA for SSH research related to ionizing radiation will be open to the integration of related topics in response to the demands at different levels: citizens, policy makers and implementers

3. General conclusions

“Communication should be seen as an important form of stakeholder engagement, and one that stresses dialogue and two-way communication rather than a simple provision of information. Knowledge-based society requires involvement of citizens at a large scale. Stakeholder engagement has to be an integral part of a decision-making. Mutual learning and transparency among all stakeholders, including scientists and lay people, is vital. A technocratic approach, where *‘experts know best and can decide for the people who do not understand the nuclear issues’* should be switched to a socio-centric communication based on public participation with which the gaps between experts and stakeholders can be bridged. Citizen initiatives and engagement opportunities should be created. A trans-disciplinary approach in risk communication (collaboration with natural science, social sciences and humanities) is important in order to develop appropriate, responsible and value based risk communication. The converging values and differences among the different groups of stakeholders should be identified.”

(From the RICOMET conference)

Some of the most significant conclusions related to communication about IR emerged during numerous EAGLE events and other actions.

A public right is to be informed and participate in decisions about the ionizing radiation applications, so the information from the information sources should be comprehensive, transparent, available, accessible, on time and should include information about practices, benefits, potential health and environmental risks

Trustful information sources

The information sources should build confidence in their trustfulness over long term in order to establish positive relationship with the public and to assure that their information materials which is many times good, attractive and understandable is used;

- The information sources should work more on credibility and comprehensiveness of information since they are perceived also by journalists to be driven by interest and are suspected too often conceal or hold back the truth;
- Failing to provide comprehensive and on time information may seriously harm the credibility of authorities and cause large difficulties in management of the emergency situation in the longer term;
- The most important is to give information truthfully without a delay in understandable language and based on good practices;

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- Responsible institutions would need to recognize the benefits of two-way communication with public and not only the disadvantages;
 - The information sources should improve the transmitting of the information to the general public by improving the wording in a readable and understandable manner which would be than used by media;
 - The communication on IR should take into account all sources of information presents in different media, sometimes also providing unreliable, misleading data and rumours, which people choose and prefer no matter how trustful they objectively are;
 - Clear, concise messages about different aspects should be given to the public in case of nuclear accidents and should be available also in some international language (like English). Mass media could play a key role in reassuring the public if the countermeasures are clearly explained;
 - Know your public: attitudes, risk perceptions, historical memory and address these characteristics in your communication. Take specifics of the country into account (e.g. existence of nuclear installations, level of public understanding of radiological concepts).
 - It is necessary that also nuclear industry changes the communication strategies and to rely on objective, comprehensive and complete information which should be given on time without use of legal means to restrict information;
 - When sending the information, nuclear professionals must adapt to non-nuclear society. Communication must take into consideration education, age, gender, perception, attitudes, etc.;
 - Even under uncertainty and recognizing their limitations, transparent, clear, understandable information must be provided to the public and the mass media since the beginning of the early phase of any nuclear emergency by the responsible authorities and government. Many different channels have to be used to reduce the misleading information and rumours;

Information channels

- Traditional media and social media interact and are used as source by both sides though the principle information sources about nuclear emergency (e.g. Fukushima accident) for majority of people remains traditional media (like television, newspapers and radio);
 - Key to effective public social media communication is a constant presence in crisis times as well as in non-crisis times; social media are just a tool – it is up to humans to define its role and value;
 - There should be many different channels to reach the public and the information should be adapted to the level of understanding, but the main message should be
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harmonized;

→ Communication of risk in mass media is generally weak and requires improvement;

Emergencies

The interest of people on the nuclear emergency is high and last for long time therefore information sources should assure appropriate provision of information over significant time periods;

Journalists as main public information points

- As journalists via different media still remain the main source of information for population there should be regular and continuous links between information sources and journalists in order to provide the comprehensive and accurate data;
- Information sources should have a specialized knowledgeable spoke-person to communicate with journalists and access to the scientists which should be ideally learnt how to communicate with public, particularly in use of understandable language;
- Still a vast majority of Europeans feels the information the media offers about IR is not sufficient, therefore information sources should develop better strategies in order to effectively communicate with public, including the approaches to link with media;

Stakeholder engagement

It is important to improve public knowledge by providing relevant and timely information in an understandable way. This process takes time and resources and should be continuous. (There is a need to identify the level of knowledge and understanding related to different IR applications).

The reasons for stakeholders' perception of radiological risks should be investigated (psychometric method analysis), and analysis of the psycho-social and economic environment of the area should be identified. The perceptions of risk could be different within different stakeholder groups and shall be addressed separately.

An analysis of the opinion of the different stakeholder groups might help to reveal the differences regarding the concerns and demands coming from different segments. (Surveys, focus groups, interviews or other social science methods are useful to identify the values, demands and concerns of stakeholders and how these are prioritised.)

The government or other responsible institution should provide clear information at the

beginning of the programme related to IR application to all stakeholders. The extent to which demands from stakeholders will be taken into consideration should be clear beforehand.

The analyses of previous stakeholders' experiences and lessons learned related to ionizing radiation applications as well as health protection campaigns should be considered before developing the communication and stakeholder involvement activities.

Integrating economic and social concerns into decision making process can be accomplished by forming partnerships with impacted communities or stakeholders and taking time to learn about community quality of life and environmental justice concerns.

Further EAGLE resources online at <http://eagle.sckcen.be/en/Deliverables>:

EAGLE Deliverable D4.10 Report from Initial project conference 'Let's Communicate about Ionizing Radiation'. The Conference was the first public event of the project EAGLE taking place on 26th of November 2013 in Paris. The conference brought together stakeholders from ten EU countries, including representatives from the nuclear industry, national radioactive waste management organisations, regulatory bodies, medical implementers, members of the media and civil society.

EAGLE Deliverable D4.12 Report from 2 virtual stakeholder workshops. Two events have been organised in order to brief participants about interesting results and main recognitions from the analytical work in EAGLE project, to present critical reviews, especially the gaps, needs and relevant issues in each stakeholder group, to get the reflection and feedback on the materials which were prepared and to collect their comments and suggestions how to improve the communication about ionising radiation with the general public. The attendees came from all stakeholder groups including representatives from the nuclear industry, national radioactive waste management organisations, regulatory bodies, medical implementers, members of the media and civil society.

EAGLE Deliverable D4.11 Report from final project conference – RICOMET 2016 The Second International Conference on Risk Perception, Communication and Ethics of Exposures to Ionizing Radiation. It was the opportunity in which almost 100 participants have been contributing through presentations, discussions, exchange of opinions and suggestions. The final results of the EAGLE project will be developed by taking into account the recommendations not only from the EAGLE stakeholder network but also from other projects like OPERRA, PLATENSO and CONCERT and involved participants including HORIZON 2020 projects participating at the conference, for instance the project HONEST.

Proceedings of the two RICOMET conferences online at <http://ricomet2016.sckcen.be/en> and <http://ricomet2015.sckcen.be/en>

PERKO, T., LAZARO, P. G., CHOFFEL DE WITTE, I. & KORON, B. (2015) **Book of Abstracts**.

International conference: RICOMET 2015. Risk perception, communication and ethics of exposures to ionising radiation. Mol, Belgium.

D. Diaconu, T. Perko, B. Koron, M. Constantin, V. Vanspringel (2016) **Book of Abstracts**. International conference: RICOMET 2016. Risk perception, communication and ethics of exposures to ionising radiation. Mol, Belgium.

Appendix

Journal of Radiological Protection, Volume 36, Number 2 - List of articles as follows:

- [First International Conference on Risk Perception, Communication and Ethics of Exposures to Ionizing Radiation \(RICOMET\)—special section editorial.](#) P Allisy-Roberts, C Turcanu and F Hardeman
- [Improved communication, understanding of risk perception and ethics related to ionising radiation](#) Tanja Perko, Wolfgang Raskob and Jean-Rene Jourdain
- [Overcoming the framing problem—a critical-ethical perspective on the need to integrate social sciences and humanities and stakeholder contributions in EURATOM radiation protection research](#) Gaston Meskens
- [Interdisciplinary perspectives on dose limits in radioactive waste management. A research paper developed within the ENTRIA project](#) Karena Kalmbach and Klaus-Jürgen Röhlig
- [A review of the Generic Design Assessment \(GDA\) Public Dialogue Pilot \(2015\) for new nuclear build in the UK: lessons for engagement theory and practice](#) John Whitton, Ioan Parry, Colette Grundy, Annabelle Lillycrop and David Ross
- [The limits of public communication coordination in a nuclear emergency: lessons from media reporting on the Fukushima case](#) Iztok Prezelj, Tanja Perko, Marie C Cantone, Eduardo Gallego, Yevgeniya Tomkiv and Deborah H Oughton
- [How did media present the radiation risks after the Fukushima accident: a content analysis of newspapers in Europe](#) Yevgeniya Tomkiv, Tanja Perko, Deborah H Oughton, Iztok Prezelj, Marie C Cantone and Eduardo Gallego
- [Safecast: successful citizen-science for radiation measurement and communication after Fukushima](#) Azby Brown, Pieter Franken, Sean Bonner, Nick Dolezal and Joe Moross
- [Lay public mental models of ionizing radiation: representations and risk perception in four European countries](#) Nadja Železnik, Marin Constantin, Nina Schneider, Claire Mays, Grazyna Zakrzewska and Daniela Diaconu
- [Satisfaction with information about ionising radiation: a comparative study in Belgium and France](#) C O Turcanu, M-H El Jammal, T Perko, G Baumont, E Latré and I Choffel de Witte

- [Looking for citizen-centered communication: dialogues between radiological protection or nuclear safety specialists and media professionals](#) Claire Mays, Jaroslav Valúch, Tanja Perko, Irena Daris, Chiara Condi, Agnieszka Miśkiewicz, Grazyna Zakrzewska, Marin Constantin, Daniela Diaconu, Metka Kralj and Nadja Železnik
- [The Aarhus convention in the nuclear sector—right to information versus nonproliferation?](#) Borut Stražišar and Metka Kralj
- [The radiology informed consent form: recommendations from the European Society of Cardiology position paper](#) Clara Carpeggiani and Eugenio Picano
- [Ethical challenges in social media engagement and research: considerations for code of engagement practices](#) Monika Gehner and Deborah Oughton