BOOK OF ABSTRACTS
SCK•CEN-BA-69

RICOMET 2015
Risk perception, communication and ethics of exposures to ionising radiation

International conference: RICOMET 2015

Risk perception, communication and ethics of exposures to ionising radiation

June 15-17, 2015, Brdo Congress Center, Slovenia

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Organising committee:

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Venue

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Table of Contents

Programme

Legend:

P – plenary	F – focus group discussion	W – workshop
PP – poster presentation	S – session	D – discussion
A – abstract		

Posters in the exhibition hall:

- Incorporating values into decisions for both ionising and non-ionising radiation protection: the importance of risk perception and effective communication. (A: PP 1.1.)
  Ray Kemp, Consulting Ltd, UK

- Integration of social sciences and humanities into radiation protection research in the Belgian Nuclear Research Centre (A: PP 1.2*.)*
  Catrinel Turcanu, SCK·CEN, Belgium

- Communicating safety culture within the radiation safety regulatory authority (A: PP 1.3.)
  Vasiliki Tafili, EEAE, Greece

- Improvements in public awareness and risk perception in benefit of the Romanian Cernavoda CANDU 6 NPP (A: PP 1.4.)
  Andrei Razvan Budu, University "Politehnica of Bucharest", Romania

- Communication and information on ionizing radiation as a tool for social consensus around the construction of new repositories for radioactive waste in Poland (A: PP 1.5.)
  Wioleta Olszewska, Institute of Nuclear Chemistry and Technology, Poland

- RENEB – biodosimetry network – solution to enhance positive radiation perception in the European society (A. PP 1.6.)
  Sylwester Sommer, Institute of Nuclear Chemistry and Technology, Poland

- Influence of Mass Media Channels on Health-Related Risk Perception: the case of Fukushima (A: PP 1.7.)
  Bart Vyncke, KU Leuven, Belgium

- Effectiveness of nuclear preparedness communicators: Nuclear industry, authorities, scientists (A: *PP 1.8.)*
  Edwin Latré, U Antwerpen and SCK•CEN, Belgium

- Influence of public opinion, political elites and mass media on nuclear energy policy: From a literature review to a conceptual framework. (A: *PP 1.9.)*
  Edwin Latré, U Antwerpen and SCK•CEN, Belgium

Sunday June 14, 2015

07:00 - 19:00 *Communication networking day (Exploring Slovenia)*

19:00 - 20:30 Registration at the Congress center

19:00 and 19:30 *Shuttle bus in front of the hotel Creina, Kranj to the Congress center*

20:00 - 21:00 Welcome reception at the Brdo Castle (next to the Congress center)

21:05 *Shuttle bus in front of the hotel Brdo to hotel Creina, Kranj*

Monday June 15, 2015 – DAY 1

CONGRESS CENTER

08:00 *Shuttle bus in front of the hotel Creina, Kranj to the Congress center*

08:00 - 10:00 Registration

9:00 *Shuttle bus in front of the hotel Creina, Kranj to the Congress center*
08:30 - 10:00 *WELCOME COFFEE*

09:00 - 09:45 Pre-meetings *Invited only*

GLASS HALL 1	GLASS HALL 2	SPLENDENS HALL
EAGLE international journalist meeting Chair: *Claire Mays,* SYMLOG, France	**EAGLE information source meeting** Chair: *Nadja Železnik,* REC, Slovenia	**PREPARE WP6.3 members** **PREPARE task group meeting** Chair: *Iztok Prezelj,* UL, Slovenia

10:00 - 11:00 OPENING OF THE CONFERENCE (Planery No.1)

SPLENDENS HALL

Opening Speech
Bruno Schmitz, Head of Unit for Fission Energy, Directorate-General Research & Innovation, European Commission (A: P 1.1.)

Welcome words

- By Chair of the conference, *Tanja Perko,* SCK•CEN, Belgium Project coordinator **EAGLE** (A: P 1.2.)
- *By Sisko Salomaa*, STUK on behalf *of Jean-Rene Jourdain*, IRSN, France Project coordinator **OPERRA** (A: P 1.3.)
- *By Wolfgang Raskob,* KIT, Germany, Project coordinator **PREPARE** (A:P 1.4.)

11:00 - 13:15 Plenary No.2 Chair: *Wolfgang Raskob*, KIT, Germany

SPLENDENS HALL

Innovative integrated tools and platforms for radiological emergency preparedness and post-accident response in Europe: Communication

- Information and participation of the public in a post-accident situation: expert-to-expert interactions and social paths for recovery - insights from the PREPARE European research project (A: P 2.1.)
  Stéphane Baudé, Mutadis, France

Traditional media in the context of the Fukushima nuclear accident

- Why and how are mass media important in nuclear emergencies: theory and method for analysis (A: P 2.2.)
  Tanja Perko , SCK•CEN, Belgium
- Radiological risks in media: understandable and meaningful? (A: P 2.3.)
  Yevgeniya Tomkiv, NMBU, Norway
- Back into the collective memory to communicate about and explain a nuclear accident to the public: Issues and recommendations (A: P 2.4.)
  Marie Claire Cantone, UM, Italy
- Nuclear emergency management and countermeasures reported in mass media (A: P 2. 5.)
  Eduardo Gallego, UPM, Spain
- Public communication coordination in the case of Fukushima: challenges and recommendations for a nuclear emergency communication (A: P 2.6.)
  Iztok Prezelj, UL, Ljubljana

13:15 - 14:00 LUNCH (Congress center Lobby)

14:00 - 15:45 Reflection group discussion (Plenary No.3)

SPLENDENS HALL

Use of traditional media in the context of the Fukushima nuclear accident

Special guests – journalists who reported from and about Fukushima
Facilitator: *Tanja Perko*, SCK• CEN, Belgium

- Junichi Taki, NIKKEI INC., Japan
- Marco Antonio Del Corona, Corriere della Sera, Italy
- Miguel González Corral, El Mundo, Spain
- Julia Raabe, Die Presse, Austria

Reflection from the public

15:45 - 16:05 COFFEE BREAK

16:05 - 17:45 Plenary No.4 Chair: *Jaroslav Valuch*, Social media consultant, Czech Rep.

SPLENDENS HALL

Social media in the context of the Fukushima nuclear accident, challenges and opportunities in nuclear emergencies

- The role of social media in informing population after the Fukushima disaster in Japan/work on disproving the rumors which appear in social media (A: P 4.1.)
  Ryugo Hayano, The University of Tokyo, Japan
- Safecast – Tool for public information and engagement during and after nuclear emergencies (A: P 4.2.)
  Azby Brown, Core member and major social media contributor for Safecast, Japan
- Social media engagement framework for public health risk communications
  Monika Gehner, WHO, Switzerland (A: P 4.3.)

Q & A discussion

17:55 *Shuttle bus in front of the hotel Brdo to hotel Creina, Kranj*

18:00 - 19:00 Focus group discussion 1 *Invited only*

GLASS HALL 2

Framing and counterframing of nuclear technologies - PhD research

PhD candidate: Bart Vyncke,' KU Leuven, Institute for Media Studies , Belgium
Promoter: Baldwin Van Gorp, KU Leuven, Institute for Media Studies , Belgium
Mentor: Tanja Perko, Belgian Nuclear Research Centre, SCK•CEN, Belgium

19:00 - 22:00 Organized transport to **Ljubljana with free time in city center**
REGISTRATION at the RICOMET registration desk before 12.00!
(departure from the hotel Creina, Kranj at 18:50 and from the hotel Brdo at 19:00)

19:30 - 22:00 EAGLE Advisory Board Meeting with Management Committee
Invited only

Tuesday June 16, 2015 – DAY 2

CONGRESS CENTER

07:45 Shuttle bus in front of the hotel Creina, Kranj to the Congress center

08:00 - 09:00 Focus group discussion 2 *Invited only*

GLASS HALL 2

Framing and counterframing of nuclear technologies - PhD research

PhD candidate: Bart Vyncke,' KU Leuven, Institute for Media Studies , Belgium
Promoter: Baldwin Van Gorp, KU Leuven, Institute for Media Studies , Belgium
Mentor: Tanja Perko, Belgian Nuclear Research Centre, SCK•CEN, Belgium

08:30 Shuttle bus in front of the hotel Creina, Kranj to the Congress center
08:30 - 09:00 WELCOME COFFEE

08:30 - 09:00 Debriefings of day 1 *Invited only*

GLASS HALL 1	GLASS HALL 3	GLASS HALL 4
EAGLE international journalist meeting Chair: *Claire Mays,* SYMLOG, France	**EAGLE information source meeting** Chair: *Nadja Železnik,* REC, Slovenia	**PREPARE task group meeting** Chair: *Iztok Prezelj,* UL, Slovenia

09:00 - 10:45 Use of social media in the context of the Fukushima nuclear accident (Plenary No.5) Chair: *Deborah H. Ougton* , ULS, Norway

SPLENDENS HALL

- Ethical Challenges for Internet Research (A: P 5.1.)
  Deborah H. Ougton , ULS, Norway
- Social media reporting in the Fukushima crisis (A: P 5.2.)
  Jaroslav Valuch, Social media consultant, Czech Republic
- Tweeting about Fukushima: a content analysis of social media use in Norway and Belgium (A: P 5.3.)
  Yevgeniya Tomkiv , NMBU, Norway
- Reflection on social media role in nuclear and radiological emergencies*:* Facilitated discussion with audience and special guests (A: P 5.4.)
  Deborah H. Ougton, NMBU, Norway

Special guests:

- *Ryugo Hayano,* The University of Tokyo, Japan
- *Azby Brown*, core member and major social media contributor for Safecast, Japan
- *Monika Gehner,* WHO, Switzerland
- *Genevieve Baumont,* IRSN, France

10:45 - 11:15 Brief oral presentations of posters (5 min each poster)
Chair: *Ilma Choffel de Witte,* IRSN, France

SPLENDENS HALL

- Incorporating values into decisions for both ionising and non-ionising radiation protection: the importance of risk perception and effective communication
  Ray Kemp, Consulting Ltd, UK (A: PP 1.1.)

- Integration of social sciences and humanities into radiation protection research in the Belgian Nuclear Research Centre
  Catrinel Turcanu, SCK·CEN, Belgium (A: PP 1.2.)

- Communicating safety culture within the radiation safety regulatory authority
  Vasiliki Tafili, EEAE, Greece (A: PP 1.3.)

- Improvements in public awareness and risk perception in benefit of the Romanian Cernavoda CANDU 6 NPP (A: PP 1.4.)
  Andrei Razvan Budu, University "Politehnica of Bucharest", Romania

- Communication and information on ionizing radiation as a tool for social consensus around the construction of new repositories for radioactive waste in Poland (A: PP 1.5.)
  Wioleta Olszewska, Institute of Nuclear Chemistry and Technology, Poland

- RENEB – biodosimetry network – solution to enhance positive radiation perception in the European society (A: PP 1.6.)
  Sylwester Sommer, Institute of Nuclear Chemistry and Technology, Poland

- Influence of Mass Media Channels on Health-Related Risk Perception: the case of Fukushima (A: PP 1.7.)
  Bart Vyncke, KU Leuven, Belgium

11:15 - 11:30 *COFFEE BREAK AND POSTER SESSION*

11:30 - 12:30 Round table: **Dialogues with journalists reporting about ionising radiation issues in general (not only emergencies)** Chair: *Claire Mays*, SYMLOG, France

SPLENDENS HALL

Results of discussions with journalists from Poland, Slovenia, Romania and France reporting about ionizing radiation (A: P 6.1.)

- *Grazyna Zakrzewska*, INCT, Poland
- *Irena Daris*, ARAO, Slovenia
- *Daniela Diaconu*, INR, Romania
- *Claire Mays*, SYMLOG, France

Reflection from special guests: journalists reporting about ionizing radiation

Facilitated by *Claire Mays*, SYMLOG, France

- *Julia Raabe,* Die Presse, Austria
- *Peter Rickwood,* Atomic Reporters, Austria
- *Etienne Collomb*, Agence K-minos, France
- *Barbara Vignaux*, Cité des sciences et de l'industrie, France
- *Marco Antonio Del Corona*, Corriere della Sera, Italy
- *Yunichi Taki*, Nikkei Inc., Japan
- *Jacek Zyck*, Åšrodowisko, Press, Poland
- *Stanislaw Latek*, Postepy Techniki Jadrowej, Poland
- *Wiktor Niedzicki*, Polskie Radio, Poland
- *Ghiulfer Predescu*, Evenimentul Zilei, Romania
- *George Daniel Coman*, Românía TV, Romania
- *Renata Dacinger*, RTV Slovenija, Slovenia
- *Sašo Avsec*, Mladinska knjiga, Slovenia
- *Anja Čuček*, RTV Slovenija, Slovenia
- *Maruša Mavsar,* Zavod Neviodunum, Posavski obzornik, Slovenia
- *Gregor Pucelj*, DELO, Slovenia
- *Miguel González Corral*, El Mundo, Spain

12:30 - 13:30 *LUNCH (Congress Centre Lobby)*

13:30 - 15:00 Focus /breakout group discussions/round table

GLASS HALL 1	GLASS HALL 3	SPLENDENS HALL
(Participants of the conference) **Quality of information, the role and process of mass media in public information in the context of <u>emergency and post-emergency</u>** (Group D 1) Chair: *Deborah H. Oughton,* NMBU, Norway Co-chair: *Marco Antonio Del Corona*, Corriere della Sera, Italy Discussion, recommendations and conclusions	*(Participants of the conference)* **Quality information, the role and process of mass media in reporting of risks and benefits of ionizing radiation in <u>daily life</u>** (Group D 2) Chair: *Claire Mays* , SYMLOG, France Co-chair: *Peter Rickwood*, Atomic Reporters, Austria Discussion, recommendations and conclusions	*(Slovenian – English translation provided)* **Public understanding of ionizing radiation, challenges and solutions** (Group D 3) Chair: *Milena Marega*, REC, Slovenia Co-chair: Gregor Pucelj, DELO, Slovenia Recipients of the information: Informed decision making process related to ionizing radiation (A: D 3.1.) *Daniela Diaconu,* INR, Romania Presentation of mental model research in Slovenia, Poland, France and Romania (A: D 3.2.) *Nadja Železnik,* REC, Slovenia Discussion about what are the effects of the mental models for information sources and media (A: D 3.3.) *Special guests: Marko Polič, UL, Slovenia; Marjan Tkavc*, URSJV, (Nuclear safety authorities), Slovenia; *Lidija Živčič*, FOCUS, NGO, Slovenia; *Gregor Pucelj*, scientific editor DELO, Slovenia

15:00 - 15:30 *COFFEE BREAK and POSTER SESSION*

15:30 - 16:30 Reporting from groups D1, D2, D3 (Planery No.7)

Chairs: *Iztok Prezelj*, UL, Slovenia and *Daniela Diaconu,* INR, Romania

SPLENDENS HALL

Reporting from group: **Quality of information, the role and process of mass media in public information in the context of emergency and post-emergency** (Reporting from group D1)
Marco Antonio Del Corona, Corriere della Sera, Italy and *Deborah H.Oughton*, NMBU, Norway

Quality information, the role and process of mass media in reporting of risks and benefits of ionizing radiation in daily life (Reporting from group D2)
Peter Rickwood, Atomic Reporters, Austria and *Claire Mays*, SYMLOG, France

Public understanding of ionizing radiation, challenges and solutions (Reporting from group D3)
Gregor Pucelj, DELO, Slovenia and *Milena Marega*, REC, Slovenia

Reflections from the audience and summary

16:30 - 18:00 Round table: **Future European research agenda for communication, risk perception and ethics in radiological protection**

Chair: *Sisko Salomaa,* STUK, Finland

SPLENDENS HALL

- We are decision makers: Our influence on European research agenda: EC calls for research in radiation protection from the field of risk perception, communication and ethics (A: P 8.1.)
  Jean-Rene Jourdain, IRSN, France
- Introduction to the way Strategic Research Agendas are developed and updated in the project CONCERT (A: P 8.2.)
  Sisko Salomaa, STUK, Finland
- Priority setting and roadmap development in radiation protection research in CONCERT: integration of ethical reflections, social sciences and humanities in the future research programmes (A: P 8.3.)
  Nathalie Impens, SCK•CEN, Belgium
- Overview of Collected Research Topics from the Fields of Risk Communication and Risk Perception of Ionising Radiation and the Ethics of Radiological Protection for Future EU Research Agenda by OPERRA Questionnaire and Workshops (A:P 8.4)
  Tanja Perko, SCK•CEN, Belgium

Discussion and collecting new ideas from the audience

16:30 - 17:30 Focus group discussion 3 *Invited only*

GLASS HALL 2

Framing and counterframing of nuclear technologies - PhD research
PhD candidate: *Bart Vyncke,'* KU Leuven, Institute for Media Studies, Belgium
Promoter: *Baldwin Van Gorp*, KU Leuven, Institute for Media Studies, Belgium
Mentor: *Tanja Perko*, Belgian Nuclear Research Centre, SCK•CEN, Belgium

18:05 *Departure of the bus at the Confress center to go back to the hotel Creina Kranj – for those who will not participate in the guided tour in the park*

18:05 - 19:00 Guided tour in the park (For those who decided to do this)

18:40 *Bus will pick you up at the hotel Creina to take you to the conference barbeque*

19:00 – 21:30 Conference barbeque (Park BRDO, 5 min waking distance from the conference center)

21:45 *Departure of the bus at the Congress center to go back to the hotel Creina Kranj*

Wednesday June 17, 2015 – DAY 3

CONGRESS CENTER

08:00 *Shuttle bus in front of the hotel Creina, Kranj to the Congress center*

08:30 - 10:30 Research in the field of Risk Perception, Communication and Ethics related to Radiological Protection (4 Parallel Sessions)

GLASS HALL 1	GLASS HALL 3	GLASS HALL 4
Session 1: **Education, training and information on ionizing radiation** Chair: *Pavel Gabriel Lazaro* , UB, Romania Educational experiment with active participation of teachers and students in the field of natural radioactivity and radon exposure (A: S 1.1.) *Genevieve Baumont,* IRSN, France What happens when citizens start to measure radiation in the environment? (A: S 1.2.) *Valéry Bordois and Gaël Alkan,* Lycée de Presles, France What do institutions which take advantage of ionizing radiation want to tell the public (A: S 1.3.) *Metka Kralj,* ARAO, Slovenia Integrated approach of communication by a radiation safety regulatory authority (A: S 1.4.) *Vasiliki Tafili,* EEAE, Greece	Session 2: **Communication about nuclear energy** Chair: *Gaston Meskens*, SCK•CEN, Belgium Monitoring the complexities: Nuclear power and public opinion (A: S 2.1.) *Vilma Luoma-aho,* University of Jyväskylä, Finland The ethical issues of nuclear energy industry (A: S 2.2.) *Hayrettin Kilic,* Turunch Foundation, NGO, USA Media about Polish nuclear power programme (A: S 2.3.) *Stanisław Latek,* Nuclear Technology Institute of Nuclear Chemistry and Technology, Poland A review of the Generic Design Assessment (GDA) dialogue pilot (2015) for new nuclear build in Anglesey, UK: lessons for engagement practice, contributing to a theory of social sustainability for local	Session 3: (8:30-9.30) **Communication and risks perceptions in radiation protection in medicine** Chair: *Marie Claire Cantone*, UM, Italy The radiology informed consent form: recommendations from European Society of cardiology (A: S 3.1.) *Clara Carpeggiani, Eugenio Picano,* CNR Institute of clinical Physiology, Italy Use of ionising radiation for medical purposes: what is the risk perception of hospital personnel? (A: S 3.2.) *Catrinel Turcanu,* SCK•CEN, Belgium S 3.3. Low doses of radiation – hot spot in dose perception and radiological protection (A: S 3.3.) *Sylwester Sommer,* Institute of Nuclear Chemistry and Technology, Poland Session 4 (9.30 – 10.30) **Communication and**

Risk communication in nuclear sector – where are the limits of access to information (A: S 1.5.) *Borut Stražišar*, ARAO, Slovenia Satisfaction with the information about ionising radiation: a cross-cultural study in Belgium and France (A: S 1.6.) *Catrinel Turcanu,* SCK•CEN, Belgium	communities (A: S 2.4.) *John Whitton,* University of Central Lancashire, UK Illicit nuclear materials incineration in Izmir, Turkey (A: S 2.5.) *Hülya Yılmaz,*Özer Akdemir EGE-CEP Foundation, Turkey Nuclear fission: Economically sound or inherently unsafe? Theoretical background on and overview of the framing of nuclear fission (A: S 2.6.) *Bart Vyncke,* KU Leuven, Belgium	**stakeholder involvement in waste management and decommissioning** Chair: *Marie Pierre Bigot*, IRSN, France Stakeholder involvement and communication in environmental remediation and decommissioning – a driving force for enabling a successful implementation (A: S 4.1.) *Horst Monken-Fernandes,* IAEA, Austria Oversight of a deep geological repository: demands and expectations from local communities (A: S 4.2.) *Meritxell Martell, Spain and Claudio Pescatore,* NEA, France Interdisciplinary perspectives on dose limits in radimarcooactive waste management: a research paper developed within the ENTRIA project (A: S 4.3.) *Klaus Jürgen Röhlig,* Institut für Endlagerforschung TU Clausthal, Germany

10:30 - 10:50 COFFEE BREAK AND POSTER SESSION

10:50 - 12:30 Research in the field of Risk Perception, Communication and Ethics related to Radiological Protection (2 Parallel Sessions)

GLASS HALL 1	GLASS HALL 3
Session 5: (10:50 - 12:45) **Communication in nuclear emergency** Chair: *Catrinel Turcanu*, SCK•CEN, Belgium Communicating about risk following a nuclear incident (A: S 5.1.) *Robin Goodwin,* University of Warwick, UK Dealing with uncertainty: involving citizens in emergency planning in a nuclear municipality (A: S 5.2.) *Marlies Verhaegen,* UAntwerp, Belgium Right to accurate information in nuclear events – do	Session 6: **Perception of ionizing radiation risks** Chair: *Grazyna Zakrzewska*, INCT, Poland Why nuclear engineer should not complain about skewed risk perception (A: S 6.1.) *Iztok Tiselj,* Jožef Stefan Institute, Slovenia Public Perception on Education and Information about the Ionizing Radiation Across the EU (A: S 6.2.) *Pavel Gabriel Lazaro,* UB, Romania Towards improved public perception of nuclear safety through strengthened role of research and

we need a new codex? (A: S 5.3.) *Borut Stražišar,* ARAO, Slovenia Evacuation in the Case of Nuclear Disaster: Research Findings on Planning and Communication (A: S 5.4.) *Jelena Juvan*, University Ljubljana, Slovenia Emergency preparedness and response provision in Europe: findings and recommendations of Nuclear Transparency Watch (A: S 5.5.) *Nadja Železnik,* REC, Slovenia Eagle findings related to communication and stakeholder involvement in nuclear and radiological emergencies (A: S 5.6.) *Daniela Diaconu,* INR, Romania	higher education (A: S 6.3.) *Leon Cizelj,* Jožef Stefan Institute, Slovenia Communication of risk and public perception during Fukushima crisis in a European non-nuclear country: experts, non-experts and media (A: S 6.4.) *Isabel Paiva,* IST/CTN, Portugal Myths and reality about risks related to radiation exposure subtitle: a practical approach to science-based communication about ionising radiation without reinforcing the radiation myths (A: S 6.5.) *Tomaž Žagar,* ARAO, Slovenia

12:30 - 13:30 LUNCH (Congress center lobby)

13:30 - 15:30 Workshop: **The meaning of ethics for radiological protection research and research policy**

Chairs: *Gaston Meskens,* SCK•CEN & University of Ghent, Belgium; *Friedo Zölzer*, University of South Bohemia in České Budějovice, Czech Republic

SPLENDENS HALL

- The meaning of ethics for radiological protection research and research policy (A: *W 1.1.)*
  Gaston Meskens, SCK•CEN & Centre for Ethics and Value Inquiry, University of Ghent, Belgium
- Ethics, Uncertainty and The Culture of Radiation Protection in Medicine (A: *W 1.2.)*
  Jim Malone, Robert Boyle Professor (Emeritus) of Medical Physics, Trinity College, Ireland
- How to deal with uncertainty? Stocking the toolbox. (A: *W 1.3.)*
  Laszlo Kosolosky, Centre for Logic and Philosophy of Science, University of Ghent, Belgium

Followed by a discussion with the audience

15:30 - 16:45 **Closing plenary**

Chairs: *Tanja Perko,* SCK•CEN, Belgium; *Wolfgang Raskob,* KIT, Germany

SPLENDENS HALL

Summary and conclusions of RICOMET by all chairs (5 minutes each)

- What have we learnt from the process over these three days?
- What do we think are the key challenges to take forward?
- What do we think are the key recommendations/solutions?

Closing

16:45 - 17:00 FAREWELL COFFEE
17:15 Shuttle bus to the hotel Creina, Kranj

Thursday June 18, 2015 – Project meetings

CONGRESS CENTER

8.30 – 13.00 - EAGLE consortium meeting	GLASS HALL 1
9.00 - 17.00 - PREPARE task 6.3 meeting	GLASS HALL 2

13.00 - Lunch, Hotel Brdo, garden (EAGLE & PREPARE)

EAGLE

In Europe today, institutions, media and the general public exchange information about ionising radiation (IR) and associated risks. EAGLE is a coordination project under FP7-EURATOM that aims to clarify information and communication strategies to support informed societal decision-making.
EAGLE brings together representatives of the nuclear community, users of ionizing radiation, authorities, mass and social media, and informed civil society, from a range of European countries employing nuclear power or not. The EAGLE project is a stakeholder driven project. There are 11 consortium members in the project from eight European countries, representing old and new member states. Members of the consortium team have expertise in different domains. They belong to the nuclear industry, nuclear research, academic institutions, mass media, non-governmental agencies and authorities. EAGLE includes a Stakeholder Representatives Group (SRG) and a Stakeholder Advisory Board (SAB). The SRG is a consultation body of representatives from information sources, channels, and receivers from the various countries in the project. Through workshops and other means the SRG reflects on the project working documents and results, and provides feedback regarding their relevance and usefulness in practice. The EAGLE SAB is formed from a range of stakeholders and helps to ensure that the project's approach is tailored to the diversity of stakeholders involved in communication processes. At the moment, there are more than 100 stakeholders from all over Europe actively involved in the project and the network is growing on a monthly basis.
In the first period of the project, Eagle organised workshops, dialogues and interviews with publics, journalists and information sources, applied the mental models approach, conducted public opinion surveys and overviewed mass and social media treatment of IR topics, including in the aftermath of Fukushima. In addition, it overviewed a historical public opinion surveys and communication material related to opinion, attitudes and knowledge about ionizing radiation in EU.

From the most significant results of the project in a first period of the project it can be seen that there is a big difference between the public perception and intentions of those who are providing information on IR risk. Mutual learning by all stakeholders is required. Communication about ionizing radiation is still too much seen as a one-directional transfer of information from a source to a receiver. On one hand, communication by users of IR is mainly inspired by the idea that the general public should be 'educated' by 'explaining them the facts' and by assisting people to 'better understand' nuclear technology. On the other hand, citizens miss the recognition by an industry and research of being a competent stakeholder. Journalists are very reluctant to communicate with representatives of public relations. They appeal for experts to be trained for media communication.

The EAGLE project identified areas for further improvements in the communication about ionizing radiation:

i.) Public opinion research related to ionizing radiation in EU is mainly focused on attitudes towards nuclear energy and omits other applications or challenges. Eagle suggests identifying the actual impacts of IR in everyday life and focusing on meaningful issues for the public.

ii.) Societal communication about IR risks has become more complex, extensive and multi-directional. EAGLE suggests to more joint learning and participative problem-solving.

iii.) New media speed up, decentralise and diversify information provision while offering platforms for direct citizen participation, expression and feedback. EAGLE identified the need of institutions to adapt with new personnel, new practices and new policies related to communication and public involvement.

iv.) The ideal of communication about radiological risks is to support the stakeholders to make informed decisions and to establish two-way communication and joint problem solving. To be able to take an informed decision, people need a certain level of issue understanding. Research shows that communication related to radiological field will not trigger enough attention to be heard or recalled among people with low levels of knowledge; consequently

they will not be able to engage in the decision-making process. From this point of view, teachers in schools and other people involved in education programs hold an important role in risk communication and public understanding.

The work performed since the beginning of the project in different work packages is the following:.
• WP1 seeks to improve education, training and information (ETI) material employed in communication about ionising radiation by information sources (industry, experts, authorities, medical field) across EU member states. Tools are assessed through interviews with heads of nuclear institutions along with protocols and questionnaires given through Euratom national contact points. Upgraded ETI material, activities, and communication strategies will be proposed as a coordinated European approach for practical implementation.

• WP2 engages members of information source institutions and practitioners/representatives of the social and traditional media in a series of national and international virtual dialogues (face-to-face and virtual). These dialogues considers information transfer and media handling, as well as the context of institutional, media and citizen discussion of ionising radiation and associated risks. The dialogue groups reviews existing aids and produce practical guidance tools to improve communication for more informed decision-making.

• WP3 analyses education, training and information (ETI) from the point of view of the final recipients of information – EU citizens. Existing desk research for all EU Member states analyses along with public opinion polls (in France, Belgium and in Slovenia), interviews with representatives of a general public and the outcome of workshops with representatives of informed civil society conducted in select countries. In addition, the 'mental model' approach is employed to investigate potential differences between professionals and the public regarding social and cognitive representations of ionizing radiation risks, and identify means to better support informed public decision-making related to this topic.

• WP4 Stakeholder participants comment and provide feedback on project products through two virtual workshops. Additionally, three pilot actions are implemented in three countries to test, evaluate and upgrade communications products.Information and results are disseminated among stakeholders and the public on an ongoing basis. Sharing of results and communication are facilitated through the web site, social media tools and the "EAGLE Stakeholder Platform." EAGLE electronically publishes its recommendations for improving the education, training and communication processes related to ionising radiation. EAGLE will hold a final International Stakeholder Conference with members of academia, operators' regulators, authorities, medical sector, health organizations, consumers, different associations, traditional media, new media, emergency management and the public to exchange experience, methods, and tools developed throughout the project. The event will publicize project results and gather feedback from stakeholders on employing these tools to better support European citizens' understanding of ionising radiation.

• WP5 includes the activities for the consortium management of the project. In addition to the regular tasks related to the project co-ordination and management, the WP5 takes care, that is the EAGLE highly linked to other EC FP7 projects, dealing with similar topics. The International Conference on Risk Perception, Communication and Ethics of Exposures to Ionising Radiation (RICOMET 2015), is one of the most significant results of the WP5 objective to cross-link the EC projects.

OPERRA

The OPERRA project (Open Project for the European Radiation Research Area), launched in June 2013 for four years with financial support from the European Commission (Grant Agreement 604984), aims to build up a legal and logistical coordination structure to administer future EU calls for projects in radiation protection.

Background and objectives:
As part of Horizon 2020 (the EU framework programme for research and innovation), the European Commission is seeking to set up coordination structures to which some of the management of research programming (budget administration, collection of information for calls for projects, introduction of European recommendations, etc.) will be delegated. One of the aims of these "umbrella" structures will be to simplify the procedures and optimise the costs of coordinating European research.
The main purpose of the OPERRA project is to meet this requirement in all radiation protection research fields (risks associated with low doses of ionising radiation, radioecology, management of radiological and nuclear emergencies, dosimetry, medical uses of ionising radiation, etc.), particularly by implementing EU calls for research projects.
OPERRA aims to set up a tool that will be used to develop a research strategy common to all players in radiation protection, which will have greater visibility worldwide. Most notably, it should provide greater coherence between national research programmes in radiation protection and EU programmes, and it should also identify all the finance mechanisms available. It brings together the bodies involved in radiation protection research, notably the MELODI Association for low-dose risk research, the European Radioecology Alliance, the NERIS European emergency response platform and the EURADOS dosimetry network.
This EU project also aims to encourage the participation of everyone involved in radiation protection—and not just national institutes and agencies—in the definition of strategic research agendas (SRAs) and the associated road maps: universities, stakeholders, academic partners (e.g. professional societies such as the European Society of Radiology), new EU Member States and competent radiation protection authorities and other technological platforms (such as SNETP for nuclear safety and IDGTP for radioactive waste management) that may or may not fall within the scope of Euratom's competences.

Organisation, main achievements and future prospects:
IRSN is responsible for coordinating the OPERRA project for a period of four years.
The OPERRA project should ultimately make easier the identification of European research priorities in radiation protection, taking account of the needs of society, stakeholders, the decision-making bodies of radiation protection agencies and researchers. It is expected to:

- Propose new procedures for calls for research projects in radiation protection, notably by organising two calls for projects in December 2013 and December 2014;
- Raise the overall profile of European research into radiation protection and facilitate exchanges with countries already affected by nuclear accidents and incidents;
- Advance cooperation between research institutes and the academic world, ensuring greater visibility for the new EU Member States;
- Generate synergy between national research bodies;
- Reinforce cooperation in research into low doses between MELODI, representing Europe, and non-EU countries such as Japan and the US;
- Establish a shared vision of needs in terms of radiation protection legislation;
- Ensure better coordination of radiation protection training and education activities
- Allow easier access to major research infrastructures.

As part of the activities implemented along the first period of the OPERRA project, one of the major achievements was the organisation of a first call for RTD projects. The text call focused on low-dose risk research was published in December 2013 and closed in March 2014. Among the 22 projects submitted,

a panel of independent experts favourably evaluated 17 projects above the required thresholds. Finally, consistently with the budget available for the call (1.5 MEuros), 3 projects were selected in June 2014 according to the ranking list established by the expert panel. The implementation of these projects is expected by the 1st of December 2014 and will lead to the inclusion of new partners within the OPERRA consortium that will growth from 14 to 34 partners.

The organisation of the second OPERRA call was initiated in January 2014. Preliminary activities comprised the identification of synergistic priorities between the European platforms active in radiation protection research (MELODI, ALLIANCE, NERIS, EURADOS) and a public consultation via an e-survey collecting views and thoughts about the research priorities for the future. The outcomes of the work done along the year 2014 served the expert panel in charge of drafting the text call. The budget dedicated for this call is 2.5 MEuros. The second RTD call addresses all fields of radiation protection research, and not only the low-dose risk research. The text call has been published on 15 December 2014 and the call will close on 12 March 2015. It is anticipated that a panel of independent experts select by June 2015 four research projects to be funded.

PREPARE

The PREPARE project (http://www.prepare-eu.org/index.php) aims to close gaps that have been identified in nuclear and radiological preparedness following the first evaluation of the Fukushima disaster. Among others, the project will address the review of existing EPR (emergency preparedness and response) procedures for dealing with long lasting releases, cross border problems in monitoring and food safety and further develop missing functionalities in decision support systems ranging from improved source term estimation and dispersion modelling to the inclusion of hydrological pathways for European water bodies. In addition, as the management of the Fukushima event in Europe was far from optimal, a so called Analytical Platform will be developed exploring the scientific and operational means to improve information collection, information exchange and the evaluation of such types of disasters. This will be achieved through a collaboration of industry, research and governmental organisations in Europe taking into account the networking activities carried out under the NERIS-TP project. Furthermore, the NERIS Platform member organisations (so far 50 partners) will be actively involved in the development of the new tools.
Important to note here is also the engagement with Japanese scientists under the umbrella of the NERIS Platform and the NERIS-TP project. This collaboration will allow further insight into the Fukushima disaster and how this will be treated in the future. At present, collaboration with the University of Fukushima and CRIEPI in the frame of the improvement of the aquatic models and contaminated goods has been settled.

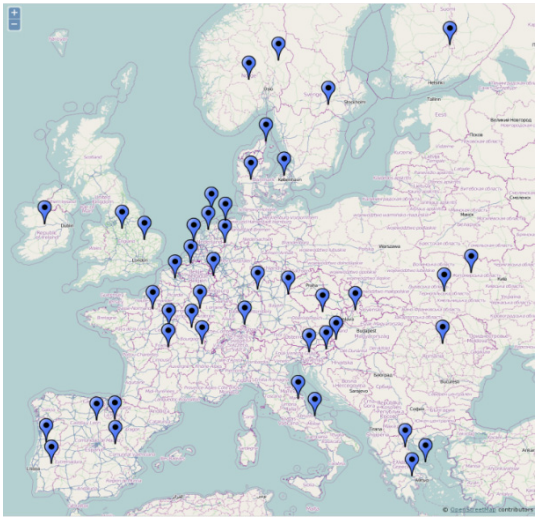

Figure 1: Preparing Europe for Nuclear Emergency and Recovery (45 partners of PREPARE)

The PREPARE project is subdivided into seven research and one management activity. The management activity concentrates in the operation of the project and keeps theinterlink to end users and the European Commission. The research work packages include also activities related to training and dissemination which is of high importance to achieve the objectives to harmonise response in Europe. The work packages can be characterised as follows:

1. Development of operational procedures for long lasting releases
2. Development of a so called "Analytical Platform" with the objective to serve as a focal point for the collection of and analysis of information from any nuclear or radiological event, particularly regarding the consequences and any further developments
3. Development of recommendations related to quality control and management of contaminated goods which are applicable to whole Europe, taking into account the viewpoint of all relevant stakeholders (e.g. producers, retailers, consumers and administrations at national and regional levels)

4. Improvement of atmospheric components of decision support systems such as ARGOS and RODOS in particular the estimation of a potential source term based on a combination of atmospheric dispersion calculations and monitoring data around a power plant and the physico-chemical properties of radionuclides emitted to the atmosphere
5. Improvement to aquatic aspects of decision support systems by integrating state of the art aquatic models into the RODOS DSS and couple them with countermeasure simulation models
6. Investigate the conditions and means for relevant, reliable and trustworthy information to be made available to the public at the appropriate time and according to its needs, both during the nuclear emergency as well as in the post-emergency phases
7. Training and exercising is an important aspect of any RTD development and therefore treated as a separate work package. Basic training courses in the field of nuclear and radiological emergency and recovery planning and response and the organization of specific exercises related to transport accidents and large scale cross border contamination monitoring will be organized

P 2. 1. Information and participation of the public in a post-accident situation: expert-to-expert interactions and social paths for recovery - insights from the PREPARE European research project

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Abstract

In order to evaluate processes of information and participation of the public in post-accident situations, the PREPARE European research project has carried out an analysis of the experience of local populations and of experts in the post-Chernobyl and post-Fukushima contexts, in the perspective of supporting the capacity of affected actors to protect themselves.
In a post-accident situation, local populations face the maximum level of complexity as their day-to-day life is disrupted by the consequences of the accident. In a context in which the usual patterns of societal response to complexity are jeopardized by the accident and its consequences, local populations need not only to manage the radiological issues associated with post-accident situation but also to make numerous daily life choices (including the choice to leave, stay or return) coping with a whole range of unfamiliar issues. If upper levels of decisions are expected to bring support, information, expertise and means, many decisions and actions stay in the hands of local actors while the spreading of distrust and lack of familiarity with the situation are impeding the building of a consistent multilevel societal response. Local population thus has to recreate the conditions to access (and sometimes build by themselves) trustworthy, reliable and understandable information, understand the situation at the individual and community level and build relevant action according to their own situation. In this context, the societal dimension of the local response to a post-accident situation is of key importance.
As regards expertise, it is widely recognized that experts have an essential role to play in the management of a nuclear emergency situation and the following recovery. Institutional and non-institutional experts, as a group, actually stand between the complexity of a nuclear emergency and post-emergency situation and the complexity of societal needs arising from that situation. This calls for a large number of various experts to interact with society in very diverse ways, and points to the need for a specific analysis of the way experts, as a group, could improve their management of this complexity, and therefore prepare to it. Acknowledging that the quality, trustworthiness and relevance of information of affected populations and stakeholders depends not only on the individual actions of each expert but also on the interactions between experts, we analyse the conditions for the development of collective sense of consciousness and responsibility between experts, based on a shared goal of "enlightened protection" of populations.

P 2. 2. Why and how are mass media important in nuclear emergencies: Theory and method for the analysis

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Abstract

The media play a progressively important role in contemporary crisis situations including nuclear or radiological accidents. Media studies now take it as granted that mass media will be the most prominent information channels related to risk communication for the general public. They are used by different stakeholders and plays the role of a "watchdog" of society. However, the media also has to fulfil the economic aspects of publishing or broadcasting, with 'if it bleeds, it leads' being a well-known phenomenon in journalism. With the way of reporting (framing of the event), media can create, shape and terminate a crisis. They represent, interpret, and construct the reality, and additionally, the related political and public salience of various issues is partly driven by the media. Moreover, for most peple information about the nuclear domain is not directly experienced, but rather learned through elite discourse and communication in the media. The way emergency actors and media communicate about the risk from a nuclear accident can directly and indirectly influence a management of a nuclear event.
The media content analysis – the two month long newspapers' reporting about the Fukushima nuclear accident- was conducted in five PREPARE project countries (Belgium, Italy, Norway, Slovenia, Spain) and in Russia as a joint research partner outside of the project. The goal of the media analysis was threefold. Firstly, to support efforts to improve an effective public communication about nuclear or radiological emergencies. Secondly, to identify differences in media reporting about the same nuclear event and in different countries. Lastly, to identify the factors influencing on media reporting about a nuclear emergency.
The traditional mass media are analysed since it is assumed that in the case of a major crisis event - the new media channels have been found to be no more important in news diffusion than the traditional ones. New media channels (e.g. mobile phones, e-mail) can in general replace interpersonal interactions in what is called an exploding crisis event, as people call friends and family to obtain information. The focus in the analysis is on the press in particular, because it is confirmed by inter-media agenda setting theory, that media tend to cover on similar issues and the media content of different traditional media (TV, newspapers, radio) follows the same stories. In other words, what is broadcasted on TV or radio is also reported in newspapers. The focus of analysis on newspapers is also due to findings of several recent public opinion surveys which indicate that in the case of a nuclear accident people mainly relay on the public information from traditional media.
The theory behind the PREPARE analysis and the method is presented and explained in details.

P 2. 3. Radiological Risks in Media: Understandable and Meaningful?

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Abstract

Communication about radiological risks to the public is a challenge. The public has only limited knowledge about radioactivity and the majorities have little experience of exposures outside the medical sector. They also have a different perception of radiological risks than that of experts. The media is an important bridge for risk communication between experts and public both during "peace" times as well as times of emergency. However, journalists are not specialists in the field and are dependent on receiving correct, understandable and reliable information from the expert sources. This presentation explores how radiation risk related information in the case of Fukushima was presented to public in traditional media. The analysis is used to develop recommendations on how this type of information should be communicated. The content of 1340 newspaper articles reporting about the Fukushima nuclear accident in Belgium ("Le Soir" and "De Standaard"), Italy ("Corriere della Sera" and "La Repubblica"), Norway ("Aftenposten" and "Dagsavisen"), Russia ("Komsomolskaya Pravda" and "Izvestiya"), Slovenia ("Delo" and "Večer") and Spain ("El País" and "El Mundo) was analysed. The results showed that media used both radiation measurement units and comparisons of exposures and doses in reporting about radiation risk related information. Differences in the reporting were observed between the countries. Comparisons with other exposures and legal limits were a preferred way of presenting radiological risks, although these may not have always been helpful and several misrepresentation and mistakes were found in the articles. The paper recommends that technical information like measurement units should always be given in the context of norms and limits. But, communicators need to be very clear about the reference points used for comparison of the doses and exposure, in order to avoid misinterpretations of the information in the media.

P 2. 4. Back into the Collective Memory to Communicate about and Explain a Nuclear Accident to the Public: Issues and Recommendations

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Abstract

Studies in media communication demonstrate that journalists in their news production use narratives drawn between present and past events. In other words, media use past nuclear accident to explain the present one. On the opposite hand, emergency communicators don't use these comparisons, due to evolving event or uncertainty related to the radiological consequences, as practice in nuclear or radiological emergency communication shows. This study explores how mass media evoked Chernobyl to explain Fukushima in order to learn how nuclear emergency communicators should improve their communication. It is based on a large media content analysis (N=1340), from six countries (Belgium, Italy, Norway, Slovenia, Spain and Russia).
Results show, that the word "Chernobyl" appeared in newspaper articles about Fukushima, almost every day and that comparisons were repeatedly made between the two accidents. This allows us to say that the journalists presented the Fukushima through the prism of the Chernobyl accident. When the Fukushima accident increased to level 7 on the INES scale, the maximum level comparable only with Chernobyl, a high degree of concern has emerged even in the titles of the articles. As expected, the number of articles about Fukushima remembering Chernobyl was enhanced by the 25th anniversary of the event, falling in the seventh week after Fukushima accident. Results show that severe radiological, socio-political and economic consequences of the Chernobyl accident did not influence the collection of the historical memory. Moreover, a shorter geographical distance to the place of a collective memory - Chernobyl -, does not influence the use of narratives in journalism when reporting about a similar event - Fukushima. Opposite, the research showed that journalists from countries where public in general has a more negative attitude towards nuclear energy or higher risk perception of the nuclear power plants (Slovenia, Russia and Spain) have used the Chernobyl accident as a reference in the Fukushima reporting, more often than in countries with lower risk perception of nuclear power plants (Italy and Belgium).
The following recommendations for improved public communication supported by the research are suggested: - When appropriate, compare radiological risks of previous nuclear accidents with radiological risks of the present accident. - Communicate contextual information such as evacuation plan, stress tests results, similar NPP, basic knowledge (e.g. difference between contamination and irradiation) and not only radiological risks. - Take specifics of the country where you communicate in to account (e.g. existence of nuclear installations, level of public understanding of radiological concepts). - Know your public: attitudes, risk perceptions, historical memory and address these characteristics in your communication.

P 2. 5. Nuclear Emergency Management and Countermeasures Reported in Mass Media

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Abstract

This paper presents the results of a large study of 1340 articles published in the first two months after the Fukushima nuclear disaster, by two major newspapers from each of six countries (Belgium, Italy, Norway, Slovenia, Spain and Russia). The focus of the analysis is the application and overall impact of protective actions, both during the emergency phase and later, how the newspapers describe those actions, which differences were apparent between countries and what recommendations can be extracted in order to improve general communication about these issues.

Of the articles analysed, 18% dealt with emergency management issues, with a focus on the actions of the emergency workers to control the damaged nuclear plant. Off-site protective actions were treated in 7% of the papers (97). In the first three weeks after the accident, the evacuation of affected populations obviously received the most attention. However, other early countermeasures, like long-duration sheltering of the population, measurement of people's contamination, especially of iodine in children's thyroids, and the use of iodine tablets as a prophylactic measure, were also addressed in the media. The monitoring of radiation levels in the affected territories was also mentioned in 39 articles, while decontamination, a typical countermeasure of the recovery phase, was treated just in 11 articles at these early stages of the accident.

Concerning food countermeasures (4% of the articles) the main issues were related to protective measures affecting drinking water (in 21 articles), farming products (in 21 articles), fish and sea food (23 articles), restrictions on food products (consumption, production, etc., in 25 articles) and food control (in 34 articles). A particularly relevant topic in European countries was food imports from Japan, treated in 36 articles, because of initial concerns in the news about presence of radionuclides in drinking water and food immediately after the accident.

Public communication is one of the most followed aspects of a nuclear emergency management. A clear lesson is that, even under uncertainty and recognising the limitations, responsible authorities need to provide transparent, clear, and understandable information to the public and the mass media right from the beginning of the early phase of any nuclear emergency. Media could be interested in evacuation since it can be presented as an event. Evacuation has to be communicated intensively not only to evacuees but also to a global public worldwide. While recovery and evaluation seem to be more newsworthy in countries without nuclear energy installations, other early countermeasures affecting people, water consumption and farming products are also topics of interest for the media already during an early stage.

P 2. 6. Public Communication Coordination in the Case of Fukushima: Challenges and Recommendations for a Nuclear Emergency Communication

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Abstract

Past nuclear accidents highlighted that the public communication coordination has been a challenge for a nuclear emergency management. This presentation explores the reasons for this and recommends some ways for communication coordination improvement. Past experiences and scientific research demonstrate that complex nuclear and other emergencies require complex approaches that are best reflected in a synchronized, coordinated and harmonized approach among all participating stakeholders. Moreover, several guidelines and plans at the national and international level have been devised in order to assure a higher level of coordination, exercises have been carried out to test interorganizational cooperation and coordinated communication, etc. However, several doubts were expressed about possibilities for coordinated public communication based on the lessons learned. This presentation explores the media communication in the case of Fukushima nuclear emergency and suggests some solutions related to the coordination of public communication derived from the media content analysis. The media content analysis was conducted in 1340 newspaper articles reporting about the Fukushima nuclear disaster in Spain ("El País" and "El Mundo"), Italy ("Corriere della Sera" and "La Repubblica"), Norway ("Aftenposten" and "Dagsavisen"), Slovenia ("Delo" and "Večer"), Belgium ("Le Soir" and "De Standaard") and Russia ("Komsomolskaya Pravda" and "Izvestiya"). The results of this research show several gaps in public communication coordination. For example, nuclear emergency managers are not aware that media prefer to publish conflicting information with many sides presented than coordinated agreed information. In addition, experts have limited (normative) possibilities to be involved in a public communication, while media demands subjective views to be communicated. Other information sources can formulate their personal views much easier and faster than experts. Moreover, a coordinated approach in a nuclear emergency requires centralised communication, however too many independent information sources are involved in public communication. The paper shows that coordinated public communication in a case of a large nuclear emergency looks more like a wishful thinking that a realistic expectation.

P 4. 1. The Role of Social Media in Informing Population after the Fukushima Disaster in Japan/Work on Disproving the Rumors Which Appear in Social Media

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Abstract

Fukushima Dai-ichi disaster is the first nuclear accident which occurred in the internet era. As such, a large amount of information in various forms, varied quality and intelligibility was disseminated on the internet by TEPCO, the government (local and central), NPOs and individuals.
Although conventional media such as radios and TVs were the primary means of gathering information for people in the affected areas, use of social media, in particular twitter, soon gained popularity.
I started to share various information immediately after the accident using my twitter account. To my surprise, the number of my twitter-acount followers increased from 3000 to some 150,000 within a few days; it was later found that mine was the 7th most influential account related to the accident, preceded by the national broadcasting station NHK and major newspaper Asahi accounts.
My interaction with the society using twitter resulted in

1) systematic measurement of radioactivity in school lunch, which was later funded by the government,
2) a large-scale whole body counter studies and efforts to communicate the results to residents,
3) development and deployment of a special whole-body counter for small children, called BABYSCAN, which has proven to be an excellent tool for communication, and
4) encouraging active involvement of high-school students in the measurement of their own personal dose, and have them communicate their own findings to the world.

In my talk, the pros and cons of the use of social media after the nuclear accident will be discussed, based on my 4 years of experience.

P 4. 2. Safecast – Tool for Public Information and Engagement during and after Nuclear Emergencies

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Abstract

In March 2011 in the aftermath of the Fukushima Nuclear disaster, the prime questions of citizen were "What are the radiation levels?" and "Is it safe?". These concerns became and today are still the major drivers for the Safecast project. Safecasters around the world have developed open hardware, open software, visualizations, methods, and community to answer these basic questions. We now boast a host of mobile radiation sensors worldwide and have amassed the largest open data set of radiation measurements. However, along this journey we have learned a lot, seen our limitations, seen the strengths of others, gotten requests to do more, and gotten many more questions we struggled to find answers for, and this has slowly refined our mission. Though we started with measuring radiation levels in the streets of Fukushima, our mission has expanded to the wider quest for more open data about the environment everywhere. To do so we have reached out to all corners of society: citizens young and old, companies, educational institutions, and local governments.
We have made it our mission to make everything we do "open," to encourage others to participate in our projects, and to be inspired by the Safecast Ethical Code.
As we have collected and shared more data, we have been better able to gauge the true scale of the problems we've tackled, have gotten a better idea of what else is out there, seen what is working, and more importantly areas where we could do better.
In Ricomet Conference 2015, we want to share what Safecast is doing today, in Japan and globally. We also want to share what we have learned from other projects, studies, and initiatives.

P 4. 3. Social Media Engagement Framework for Public Health Risk Communications

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Abstract

The author suggests to include a code of engagement in corporate social media policies that contain guidance as to what conduct is or is not appropriate for a particular organization with a view to building, strengthening, maintaining and/or restoring trust.
Any communication about health is about risk–bridging the gap between how experts define a risk and how the public perceives it. The World Health Organization (WHO) uses a risk communications model adapted from Peter Sandman to align public perception with actual risk, taking into account people's emotional response to a risk.
To communicate health risks effectively, facts and figures and one-way information dissemination are not enough. Communication needs to be two-way and include expression of caring and empathy to build trust, which is by far the greatest contributor to effective risk communications.
Social media can play an important role in risk communications. They allow to analyse public perception of a health risk in real-time, on an aggregate level, and to adapt communication so it is relevant, meaningful and useful. For example, in 2014, during the outbreak of Ebola virus disease in West Africa, WHO issued a single tweet to dispel rumours that homeopathy can cure Ebola; it turned out to be the fifth most retweeted @WHO tweet on Ebola in 2014.
Social media allow engaging directly with communities to build trust. Trust is crucial for people and organizations to act upon WHO's knowledge, norms, standards and policy options. Trust needs to be cultivated at all times, in all risk communications. Trust is sustained through trustworthy behaviour. Without engagement or in case of misconduct, trust can quickly and widely diminish, especially on social media.
For WHO as a normative agency of the United Nations system, trustworthy behaviour is all the more important. Standards for ethical conduct define the behaviour expected of WHO international civil servants; these include accountability, discretion, honesty, impartiality, independence, integrity, loyalty, respect and technical excellence.

P 5.1 Ethical Aspects of Social Media Research

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What considerations should researchers have when using social media for research or communication purposes? If a member of the public has placed their thoughts, ideas or experiences in the public domain of social media, is it then appropriate to assume that have they then waived any rights to privacy and assume consent to the use of that information in research? Or do researchers have an obligation to obtain some form of consent from the individual before using or publishing that material?

Developments in information technology (IT) have raised a number of ethical issues and challenges, both for society in general and for researchers either engaged in IT research or using the products of that technology. This presentation will give a brief overview of some of the challenges, and present some of the ethical codes and guidelines for internet research, including recent guidelines proposed by the Norwegian Research Ethics Committees. It will also discuss some of the cultural differences in the way that privacy and "relationship ethics" is addressed between different countries.

References

Ethical decision-making and Internet research: Recommendations from the Association of Internet Researchers (AoIR) for ethical guidelines for internet researchers: http://aoir.org/reports/ethics.pdf
Ess, Charles 2015. New selves, new research ethics? In: Fossheim, Hallvard and Ingierd, Helene. Internet Research Ethics http://press.nordicopenaccess.no/index.php/noasp/catalog/book/3

P 5.2. Social Media Reporting in the Fukushima Crisis

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Abstract

How was information about the Fukushima Daiichi nuclear disaster presented and transmitted in traditional and new media? How did these two major families interact in the post-Fukushima media dynamic? A brief survey was conducted to complete our understanding of how European institutions applied social media in this crisis. Societal communication about risks, especially under the influence of historic nuclear accidents and other trans-border events, is commonly recognized to have become more complex, extensive and multi-directional. Our review shows that new media appear to reinforce this movement, as they speed, decentralise and diversify information provision while offering platforms for direct citizen participation, expression and feedback. The growing presence of the new media and their interaction with the traditional media result in potentially greater challenges for institutions whose mission includes communication with the public about ionizing radiation risks in particular.
Do the key actors have good understanding of this shifting public communication environment?
Do they have full understanding of ethical risks involved?
What skills and resources need to be in place for effective prevention and response in the age of social media and moble communication?
Are there already good practices to be shared and learned from?
What opportunities this new reality offers for moving closer to a citizen-centred ideal of risk and emergency communication?

P 5.3. Tweeting about Fukushima: a Content Analysis of Social Media Use in Norway and Belgium

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Abstract

The growth of social media has created new opportunities as well as new challenges for radiological crisis communication. Social media can facilitate direct, fast and transparent communication and enable a two-way dialogue and engagement with the public. This paper presents results from a content analysis of Twitter messages posted in Norwegian and Dutch languages (Norway, Flanders (Belgium) and The Netherlands) after the accident in the Fukushima nuclear power plant. The aim of the study was to assess what kind of content appears on social media during the time of crisis in countries, which are not directly affected.
The analysed tweets contained the word "Fukushima", were published between 11th of March 2011 and 11th of May 2011, and accessed using the Twitter search engine. The survey covered all tweets posted in Norwegian (N=414) and a representative sample of Dutch tweets. The coding of tweets was performed using standard content analysis methodology and a coding book developed for this particular study.
Preliminary analysis shows that the Fukushima accident raised interest and concern in the European population, and appeared in discussions on the social media. Our data illustrate the importance of traditional media in communication within the social network of Twitter, as evidenced by abundant referencing to newspaper articles. At the same time, the voice of the expected crisis communicator the governmental organizations were missing. In addition, the content of the tweets was compared between the two countries, with a particular focus on the fact that Belgium has 7 nuclear energy reactors, while Norway is not a nuclear energy country. The report highlights the necessity of a good communication strategy for application within the social media and in the interactions with public, for quick, direct and transparent communication.

P 6. Dialogues with Journalists Reporting about Ionising Radiation Issues in General (not only emergencies) and Radiological Protection in Specific

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Abstract

With the help of journalists and science communicators from four countries, we will present the 2014 outcomes of dialogue workshops which reviewed mass media reporting on ionizing radiation (IR) risks.
EAGLE is focused on enhancing education, training and communication processes for informed behaviors and decision-making related to ionizing radiation (IR) risks. One EAGLE module brings together journalists, science communicators, and information sources in nuclear and non-nuclear Member States. The module is entitled 'Mass media and social media: Move towards mutual understanding' and the intention is to review actual approaches, initiate to best practices, and deliver recommendations to the full set of EAGLE stakeholders.

Workshop encounters in France, Poland, Romania and Slovenia were organized in 2014 to address questions like:

- Currently, how do leading institutional sources approach public information on IR risks through traditional and new media? Do they meet particular difficulties or successes?
- How do mass media actors view this approach? Do the sources align with media needs? Do the media help to fulfill source objectives?
- What are the outcomes for the public and their ability to take everyday decisions?
- Can mutual adjustments be made? By which means?

The example of Fukushima was discussed, as well as specific articles or reports on IR topics published in national or local media in each country.
The round table will set the scene for the RICOMET break-out discussion and exchange of experience on Tuesday at 13:30 dealing with the communication of risks and benefits of IR in everyday life.

P 6. 1. Results of discussions with journalists from Poland, Slovenia, Romania and France reporting about ionizing radiation

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Abstract

National media dialogues were conducted in 4 countries in 2014 by EAGLE consortium members, grouping media representatives and sources. In today's round table, media representatives from France, Poland, Slovenia, Romania and France join EAGLE researchers on the podium to present a selection of the major themes that emerged in all countries from these dialogues, as listed below.

- Mass media specifics – Differing expectations between various media channels and publics
- Language and format
- Crisis communication vs. everyday communication
- Trust and Confidence - Verification of sources and development of risk culture
- Nuclear industry promotion vs. citizen centered risk communication
- Mediated communication (PR agencies, media experts) vs. direct communication
- Training and Capacity building for journalists

Questions for reflection are proposed for deeper discussion with the audience.

D 3. 1. Recipients of the Information: Informed Decision Making Process Related to Ionizing Radiation

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Abstract

To improve the communication towards the general public we must understand what its needs and requirements are, what is missing in the current practice, and which the necessary improvements are.
An in depth analysis of education, training and information (ETI) process from the point of view of the final recipients of information - EU citizens was conducted in order to capture the general public knowledge and perceptions related to IR and communication on IR.
The exhaustive review was the first step in identifying the best approaches to improve ETI activities regarding the understanding of the effects of ionizing radiation so as to support the citizens of the EU in making informed decisions related to ionizing radiation risks.
To understand public perceptions on IR parallel investigations of the mental models in the general public regarding the effects of ionizing radiation were preformed in France, Poland, Romania and Poland. They helped to investigate what are the differences, misunderstandings and misconceptions between professionals from the nuclear area and the public.
Findings of the public perceptions review and results of the mental models analysis will be largely discussed in 4 national workshops, which will facilitate the debate between institutional sources and the media participants on whether the mental models are "good enough" and whether authorities and media can change anything in their practices to improve the current situation.
The expected results of these workshop are firstly to help institutions responsible for the provision of information on IR as well as the media to better compile and coordinate their future activities in ETI, and secondly to collect a valuable input for defining good practices in the education, training and information of the public concerning related to ionising radiation, in order to better support an informed public decision-making process.

D 3.2. Presentation of Mental Model Research in Slovenia, Poland, France and Romania

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Abstract

Investigation of mental models which lay people have regarding the ionizing radiation in several EAGLE partners' countries has been performed in the frame of EAGLE project. Analyses of mental models in the general public regarding the effects of ionizing radiation aims to examine what are gaps, differences, misunderstandings and misconceptions between professionals in the nuclear area and the public. Based on the results from analyses of the available surveys and additional public opinion pools and the investigation of the mental models of lay people the approaches to improving ETI activities regarding the understanding of the effects of ionizing radiation will be provided and support to the citizens of the EU will be enabled in making informed decisions related to ionizing radiation risks. The main results from the lay people mental models research investigated in four countries (France, Poland, Romania and Slovenia) are:

- The attitudes towards the IR, radioactivity and nuclear technology in general slightly depend on age and gender but mostly dependent of the level and the area of education. Generally, the knowledge about IR is rather low.
- The structure of matter, particularly the structure of atomic nucleus, is rather unclear; therefore the reasons for the decay of a nucleus are very badly known.
- There are many misunderstandings concerning the sources of IR. Often as sources of IR are recognized domestic devices such as microwave oven, cellular phone or TV receiver.
- The respondents confuse the low, intermediate and high level radioactive waste. Therefore the construction of low and intermediate level radioactive waste repository is not acceptable in the close proximity of the majority's homes.
- The methods used in nuclear medicine are acceptable, due to trust to the doctors and believes of people that this is another kind of radiation.
- Nuclear power is somehow accepted but not with any great astonishment.
- Main media source regarding accidents in nuclear installations are TV, recently also internet. Mass of internet pages proved different information; sometime obscured or misguiding. Independent sources are appreciated, due to low trust in governmental sources of information.

It has to be emphasized also that the knowledge which was investigated with mental model approach is only one of the dimensions of the communications with public. Many researches also shown that the most important factors are not the one linked with how much people know about ionizing radiation but those linked with perception of risks due to different activity or technology, trust, involvement of the people in the process and opportunities for participation in decision making. This should be constantly take into consideration and also applied in the communication strategies from different sources providing information to the lay population. The research and results will be presented.

P 8.2. Introduction to the Way Strategic Research Agendas are Developed and Updated in the project CONCERT

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Abstract

The European Joint Programme on Radiation Protection Research (acronym: CONCERT) aims to contribute to the sustainable integration of European and national research programmes in radiation protection. It will do so by focusing resources and efforts in five key directions:

1. Bring together the elements of the European scientific communities in the fields of radiation effects and risks, radioecology, nuclear emergency preparedness, dosimetry and medical radiation protection, whose joint expertise is essential to continue the development of radiation protection knowledge in a multidisciplinary mode to reduce further the uncertainties in radiation protection.
2. Strengthen integrative activities between the various areas of expertise, in particular biology, biophysics, epidemiology, dosimetry and modelling as well as fostering the use of existing infrastructures and education and training activities in radiation protection.
3. Stimulate and foster scientific excellence, by setting up and co-funding advanced research programmes with the potential to enhance current knowledge and the scientific evidence base for radiation protection.
4. Exchange and communicate with all stakeholders, including the professional organizations concerned with radiation protection, the regulatory organizations across Europe, the public and media where necessary, and the international community of scientific, technical, legal and other professional experts in radiation protection.
5. Foster the harmonious application of available scientific basis for radiation protection practices across Europe, by bringing together scientific and technical expertise in radiation protection issues, standard setting know how, particularly with respect to the implementation of the Euratom Basic Safety Standards (BSS) at the legal, administrative and operational level.

The CONCERT EJP has a clear circling workflow from developing strategic research agendas (WP2), defining research priorities and roadmaps by joint programming (WP3) to the initiation and funding of specific projects in radiation protection research (WP4). Integrative activities (WP5 Stakeholder involvement and communication, WP6 Infrastructures and WP7 Education and training) are promoted with the aim to closely interact with funded research projects. Ideally integrative activities will be an integral part of research projects. Scientific research needs will be gathered in strategic research agendas by each platform (MELODI, ALLIANCE, NERIS, and EURADOS), regularly updated in the light of new developments and of multidisciplinary discussions. Additional research needs related to for medical radiation, social sciences and supporting the implementation of revised Basic Safety Standards will be explored as well.

P 8.3. Priority Setting and Roadmap Development in Radiation Protection Research in CONCERT: Integration of Ethical Reflections, Social Sciences and Humanities in the Future Research Programmes

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Abstract

The EC supports the Radiation Protection (RP) research community to tailor research activities to the needs of the society, the authorities and other stakeholders through the projects OPERRA (FP7) and CONCERT (H2020). Among others a Strategic Research Agenda for Social Sciences and Humanities in radiation protection will be developed after a systematic process of engagement with a trans- disciplinary research community. The first research agenda for risk communication and risk perception is expected already by the end of 2015 followed by the CONCERT calls in 2016 and 2017.

In OPERRA, efforts have been made to integrate research activities in a broad range of research areas relevant to RP. The focus up till now has been to create synergies between fields of low dose research, radioecology, emergency preparedness and recovery, and dosimetry. Recently, associations active in these research fields**1** have signed a Memorandum of Understanding (MoU) to cooperate closely to promote the integration of European research in the field of RP, and decided to define joint research topics for the second scientific call within OPERRA.

However, a responsible governance of radiological risks should go beyond the technical aspects traditionally lying at the core of European RP research, in order to enable informed behaviours and citizens' participation in decision-making related to ionising radiation risks. This has been increasingly acknowledged in several on-going collaborative research projects (e.g. PREPARE) and highlighted in recent guidance documents of international organisations such as ICRP and IRPA. Consequently, there is a need to better integrate social sciences and humanities in RP research and practice.

Efforts in this direction have been started in OPERRA, in order to engage researchers, radiological protection mandatories and policy makers in ethical reflections on societal justification and assessment of nuclear technology applications and on related aspects of risk communication and risk perception. Such fields of research are indispensable to elucidate to what extent the radiation protection system answers the concerns of the today's society, authorities and stakeholders. Moreover, they might stimulate participative policy development of the European radiation protection system of tomorrow.

The OPERRA project functioned as a pilot project to CONCERT, the H2020 European Joint Programming instrument in RP research that most probably will start in June 2015. CONCERT aims to contribute to the sustainable integration of European and National research programmes in the field of RP.

Within this respect, CONCERT will continue to support the coordination of RP research, by funding the development and updating of Strategic Research Agendas (SRA) in the various fields of RP research. One task of CONCERT is explicitly devoted to creating a Strategic Research Agenda for Social Sciences and Humanities in RP.

Based on the SRAs developed in the different domains of RP, priorities will be set for the research calls organised within CONCERT in 2016 and 2017. A long-term roadmap will be developed as well.
In this presentation, we will elucidate the process of priority setting for the research call to be launched in 2016.

MELODI (Multidisciplinary Low Dose Initiative; http://www.melodi-online.eu/index.html) is the European low-dose Association that took the initiative for the OPERRA project

ALLIANCE (the Radioecology Alliance http://er-alliance.org/)

NERIS (European Platform on preparedness for nuclear and radiological emergency response and recovery; http://www.eu-neris.net/)

EURADOS (European Radiation Dosimetry Group; http://www.eurados.org/)

P 8.4. Overview of Collected Research Topics from the Fields of Risk Communication and Risk Perception of Ionising Radiation and the Ethics of Radiological Protection for Future EU Research Agenda by OPERRA Questionnaire and Workshops

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Abstract

European research efforts in radiation protection need to be coordinated to ensure effective and efficient use of the limited funds available. Development of long-term European research programmes in radiation protection should also include topics related to risk communication, risk perception and ethics. The need for integration of these research domains in radiation protection was investigated and discussed by different stakeholders using an e-survey and dedicated workshops within the OPERRA project. The need for research programmes integrating input from social science and humanities has been informed by the collection of views from members of the key European platforms active in the field of radiation protection: MELODI (Multidisciplinary European Low Dose Initiative), ALLIANCE (Radioecology), NERIS (Preparedness for Nuclear and Radiological Emergency Response and Recovery) and EURADOS (the European Radiation Dosimetry Group).
The results show that a large majority of participants agreed that further research into risk communication would be beneficial to radiation protection and stated that we need to support more research in the field of risk communication and risk perception of low doses. Moreover, it was recognized that it would be useful to develop a strategic research agenda for risk communication and ethics in radiation protection. Scientific uncertainties related to low doses were noticed as one of the main challenges for efficient risk communication. The results highlight the need for social science research directed to new mass media, in order to study the influence of this type of communication on the understanding of complex concepts and the perception of radiological risks by lay people. The discussions and the e-survey suggested specific topics to be included in a long-term European research programme, for instance on stakeholder management and dialogue in order to improve the acceptability and social robustness of emergency response. Such research would not only realise the inclusion of social aspects of emergency response and stakeholder engagement, but also contribute to a greater recognition of the importance of stakeholder and public engagement and bring insights into the factors and criteria for successful stakeholder engagement. An overview will be presented and discussed of the research topics from the fields of risk communication, perception and ethics collected for future EU research agenda within the OPERRA project. In the H2020 EJP project CONCERT, a task is dedicated to develop a strategic research agenda for social sciences and humanities in Radiation Protection.

S 1.1. Educational Experiment With Active Participation of Teachers and Students in the Field of Natural Radioactivity and Radon Exposure

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Abstract

Since 2010 IRSN has an Education and Information Strategy for French citizens to enhance their Radiation Protection and Nuclear Safety Culture. One way to reach this goal is to start with the education of our future generation, primary, high school and university students, making it possible to give basic knowledge on radioactivity and nuclear risks. This will help to better understand what is at stake, enlighten their choice as citizens and even inspire vocations.
Of course addressing our youngsters requires specific Education Tools, adapted to their Educational Program and by using different approaches in language and illustrations depending on the age of the students. IRSN has therefore developed in close collaboration with ASN (the French Nuclear Safety Authority) and IFFO RME (a partner specialized in Risk Education for the different National Education levels) exhibitions for Primary and High schools. These exhibitions are hosted by experts using posters, movies and interactive tools in order to make our youngsters familiar with concepts such as the decay of uranium that produces radon (natural hazard) or nuclear fission that produces fission products, which could induce difficulties in terms of Waste Management and or in case of an accident.
As an illustration of natural radioactivity and to promote the general awareness of the hazard related to Radon, IRSN decided to distribute measurement devices for radon detection in high schools located in areas likely to be confronted with this phenomenon. The teachers as well as the pupils were therefore able to measure the natural radioactivity to which they were exposed, and to present their own measurements and analysis.
More than 16000 secondary school children and more than 15 schools have benefited from the Radon exhibitions combined with the interactive experiment supervised by experts from IRSN. The above mentioned actions gave positive results not only on an educational level but also through the measurement results. For RICOMET 2015, IRSN would like to share and illustrate the different types of work done with students and teachers in close collaboration with IRSN experts in this field.
In addition, IRSN would like to give the floor to one of the teachers and a student to present their experience to take active part in an educational program and to share their appreciation of this educational concept.

S 1.2. What Happens When Citizens Start to Measure Radiation in the Environment?

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Abstract

Our school is in the city of Vichy. Vichy is a town right in the center of the so called Massif Central, which is an elevated region in south-central France, consisting of primary mountains and plateau. The geological morphology of this Massif is extremely interesting mainly because of the presence of granite more or less rich in natural uranium, which explains why there has been in this region uranium mining in the past. However the presence of uranium in the sub-soil means that homes built on such soil can potentially contain radon.
Three teachers of the Albert Londres High School felt concerned by the radon issue and decided to start a transdisciplinary project in 2014 involving three fourth grade classes. To realize the project they decided to contact the Institute of Radiation Protection and Nuclear Safety IRSN and IFFO-RME the French Institute for Major Risks and Environmental Protection Training. IFFO-RME aims to increase citizen awareness about the link between major risk prevention and sustainable development.
They used the Radon booklet proposed by IFFO-RME and IRSN as course material with six educational worksheets and in addition IRSN provided the school with Radon dosimeters to be used by the students at home.
After a conference given by IRSN to give more insight information on the radon topic, the classes divided in small working groups exchanged their findings firstly beyond the different groups and later the results were shared with the general public in a conference.
The experiment will be described in detail during the RICOMET conference.
The experience proved to be enriching for both teachers and students. It led to another project conducted in 2015 with three students who measured the background radiation using the roads of the region Auvergne for more than three months. They have measured the background radiation with the help of the sensor kit "SAFECAST" (20000 measurements). The Mapping of their measurement results is published on the SAFECAST website. The students will meet IRSN experts to discuss their findings and share their scientific hypothesis. In particular they superimposed the measurements results on a geological map of the region Auvergne. These results will be presented by one of the students involved.
The actions related to the measurement of radioactivity and radon in the environment opened the way for the teachers to a more general reflection on teaching the in and outs of radioactivity and on the development of educational support necessary for these actions.
Inspired by the school's initiative, a similar experiment is under way in another high school.

S 1.3. What Do Institutions Which Take Advantage of Ionizing Radiation Want to Tell the Public

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Abstract

Public participation in decision-making has become a standard requirement for all activities that may have environmental impacts, including construction, operation or decommissioning of nuclear or radiation facilities. Citizens are also faced with decisions about accepting their personal exposure to ionizing radiation in medical procedures. Project EAGLE (Enhancing Education, training and communication processes for informed behaviours in decision-making related to ionizing radiation risks) under the EURATOM Framework Program 7 of European Commission aims to prepare useful guidelines for EU member states for making efficient educational materials and activities to improve public understanding of ionizing radiation and its effects on human health and environmental conditions.

One of the project's tasks was to analyse the existing education, training and information materials and activities (ETI) produced by information sources in EU member states in order to identify good practices. Aspects like application of ionizing radiation for human benefit, natural background, physiological and environmental impacts, risk perception and understanding, consequences of Fukushima accident were analyzed. Data were collected by computer assisted interviews, personal interviews and questionnaires about ETI materials and activities. Evaluation of good practices was based mainly on personal evaluation by the information sources and comparison.

Information sources support the information and education activities and believe that their ETI is good, effective and well accepted by the public. ETI produced by information sources from nuclear industry stress safe operation and safety culture, and ETI from medical information sources stress measures for mitigation of temporary adverse effects. Safety measures explained are usually not proportional to the real risk but stress the worst possible case. The mechanisms of radiation interaction with matter are only briefly mentioned and explanations do not promote understanding of the risks from ionizing radiation. Use of interactive activities and experiments increased in last decade. They are well accepted by the public and produce good results. Fukushima accident presented some challenges to communicators short after the accident but did not change the general approach of information and communication activities for public.

Survey of ETI from different EU member states showed that there is well established routine communication practice regarding radioactivity and ionizing radiation but the approaches are not unified. Risks and impacts of ionizing radiation on human well-being are not recognized in the same way. This situation can be improved by education system which will give common basic knowledge and increase the possibility that information sources develop the communication with the public according to their needs.

S 1.4. Integrated Approach of Communication by a Radiation Safety Regulatory Authority

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Abstract

The establishment of a corporate communication strategy is considered as a tool to align organization goals with communication goals. A corporate communication strategy provides direction on "what" shall be communicated, responding at the same time to "why" and to "whom" we communicate. The main expected outcome is consistency and effectiveness in the way an organization communicates.
Aim of this paper is to outline the strategic planning and decision-making approach in the communication of radiation safety regulatory authorities. Although, there is a large number of publications focused on emergency communications, to our knowledge an analysis in terms of an integrated communication strategy for a radiation safety authority is scarce in the open literature. More specifically, the case of the Greek Atomic Energy Commission (EEAE), the national regulatory authority competent in radiation safety, will be presented.
The current corporate communication strategy of EEAE:
(a) reflects the top management decision to improve and further promote transparency and safety culture practices, wherever radiation use is concerned. These two concepts have emerged in the recent years as cornerstones in reaching the objective of safety.
(b) integrates in a holistic manner the main aspects of communication that a radiation safety regulatory authority is expected to pursue: risk communication, media relations, issues management, public affairs, crisis management, internal communication.
The development of EEAE strategy is a cross-functional, dynamic and flexible process, having as key elements: systematic analysis of the internal and external environment, identification of target groups-stakeholders, identification of main issues of concern and determination of the communication goals. Emphasis is given on the role of stakeholders, the provision to the public of systematic and adequate information related to radiation risks, the special provisions for public information during radiation emergencies, as well as the unhindered flow of information internally and the top management commitment.
A detailed communication plan and a management system procedure are used for the implementation of the corporate communication strategy.
In this work we present our experience in planning and acting strategically in the field of communication, including the self-assessment through key performance indicators; finally, the challenges met during the whole process are discussed.

S 1.5. Risk Communication in Nuclear Sector – Where are the Limits of Access to Information?

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Abstract

Nuclear events in last decades (Tree Mile Islands, Chernobyl and Fukushima) posted out problem of timely information and the question of proper and trustworthy information. In such accidents everyone seeks the information what's happening behind the armoured concrete and what impact would such events provoke in everyday life and human and animal life. The public need for accurate information could be compared to the need for water in the desert. By our opinion the problem of accurate information lies long ahead of the actual nuclear accident taking place and should be dealt also in the process of siting, licensing and normal operation of a nuclear plant. At some points of this process the access to information is linked to the right to participate at decision-making regarding the environment. Submission is divided in three parts.

In first part the Aarhus convention is analysed. We present the basic rights of public in the field of environmental matters. We discuss the right to environmental information in the phase of siting of nuclear plant and also in its operational phase. Such rights will be examined also through the case law of European Court of Human Rights. Key mechanisms to access to environmental information will be presented.

Second part will deal with the problem of misuse and abuse of environmental information. Such misuse of information could be used for political reasons or for possible treat of terrorist attack. This part will examine to which extent the public right to environmental information could be limited by security reasons. We'll try to find out which are the key environmental information which should be disclosed to the public and how on the other hand to protect the sensitive information.

Third part will deal with a possible model and legal environment that provides enough of accurate and information about environmental impacts in normal and in possible accident situations during the siting and the operational phase of the nuclear facility. With implementation of such model the public need for information in case of accidents would be reduced. In such case public will probably require only basic information about the radiation and contamination levels and required actions form the locals. With such system public wouldn't have "starvation" for the information and therefore would be less vulnerable to different kinds of information manipulation. More information from one activity you publish, less bombastic are the news from such activity. In this part the key actors of such system and their tasks would be presented. Main ways of public participation in such system will be examined. If people understand possible impacts of different levels of nuclear accidents, than their only need will be to get the information about the type of the event that happened inside the nuclear plant and what they have to do to protect themselves.

S 1.6. Satisfaction with the Information about Ionising Radiation: a Cross-Cultural Study in Belgium and France

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Abstract

Public information about ionising radiation is not only a normative claim in nowadays democratic society, but also an instrument enabling citizens' informed decision-making related to various, daily-life applications of ionising radiation (e.g. the medical sector, radon in houses) as well as in the context of nuclear energy or radioactive waste, or following emergency situations and subsequent recovery.
This study investigates public satisfaction with the information about ionising radiation as provided by different actors: the industry, the medical sector, the authorities, the scientists and the mass media. Two countries are used for a cross-cultural analysis: Belgium and France. Data originate from large scale public opinion surveys carried out in 2013 (Belgium) and 2014 (France).
Parallel to this, we compare the perception of various radiological risks, the confidence in the management of these risks by the authorities and the level of knowledge about ionising radiation. Finally we test the influence of these variables on the satisfaction with the information communicated by the different actors.
Results show that in both countries, most satisfaction is expressed with respect to the public information provided by medical sector and the scientists and least satisfaction with information provided by nuclear industry. However, large differences are noticed related to satisfaction with information provided by mass media and authorities. Nuclear waste and an accident in a nuclear installation are perceived as the highest risks, among a list of potential radiation risks, while medical X-rays and natural radiation (radon or cosmic) are perceived as low risk in both countries. Interestingly, in both countries, highest confidence in authorities for the actions taken to protect the public is expressed with respect to industry related risks, e.g. a nuclear accident or radioactive waste. Confidence in authorities is in general higher in Belgium than in France. General knowledge related to ionizing radiation is rather low in both countries.
Based on the results we can conclude that communication with the public has to be improved for all actors: less than half of the population is satisfied with the information in both countries.
Furthermore, several similarities are noted among the two countries, for instance the highest/lowest perceived risk. However, there are differences in what regards the explanatory power of risk perception, confidence in authorities and knowledge with respect to the satisfaction with the information. This shows that communication has to be adapted to the context specifics of each country.
Future research should extend the inter-country comparison to a broader range of countries and complement the study with qualitative research on the information needs concerning various applications of ionising radiation.
The results presented are based on data collected in Belgium and France in the framework of the FP7 project EAGLE.

S 2.1. Monitoring the complexities: Nuclear power and public opinion

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Abstract

Organizational survival today requires more than law-abiding. Maintaining different stakeholder relationships has become important for radiation and nuclear agencies and regulators, yet the complexity of the stakeholders continues to increase. Existing stakeholder literature has not been able to adequately map the different forces and expectations that organizations face. Interaction is moving away from the organizational boundaries toward individual issues and arenas dedicated to each issue. The paper examines the changes and dynamics descriptive of stakeholder interaction of nuclear power both online and offline, and suggests communication to play a key role in organizational survival through the processes of finding the right "issue arenas" for interaction, facilitating the public debate and managing reputation. As a case study to illustrate issue arenas, the issue of building new nuclear power plants in Finland is analyzed. This article aims to provide a macro-level view on the different stages and spheres where stakeholders form their opinions about organizations today.

S 2.2. The Ethical Issues of Nuclear Energy Industry

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Abstract

As stated in a Los Alamos Report in August 1981, "There is no technical demarcation between the military and civilian reactor and there never was one." Currently 42 countries have fissionable material to produce nuclear weapons, 22 of these Countries have the capability to produce enriched uranium-235 or to separate plutonium-239. Thirteen of these countries are active in producing enriched uranium and separating plutonium. Nine of these countries have nuclear weapon stockpiles, six of which did not ratify the Comprehensive Test Ban Treaty.
On December 15, 1994, The General Assembly of the United Nations. " Decide, pursuant to Article 96, paragraph 1, of the charter of the United Nation to request the International Court of Justice urgently to render its advisory opinion on the following question: "Is the threat or use of nuclear weapons is any circumstances permitted under international humanitarian law?"
The president of the Court, Judge Bedjaui concludes that; "The very nature of this blind weapon therefore has a destabilizing effect on humanitarian law which regulates discernment in the type of weapon used. Nuclear weapons, the ultimate evil, destabilize humanitarian law which is the law of the lesser evil. The existence of nuclear weapons is therefore a challenge to the very existence of humanitarian law, not to mention their long-term effects of damage to the human environment, in respect to which the right to life can be exercised."
By the end of last century the number of civilian and military nuclear reactors reached to more than 600, and collectively they have been silent breeding ground for creating more than 150 metric tons of pure plutonium-239. During the last 60 years, the nuclear weapon states collectively produced more than 70,000 nuclear weapons, which strike civilians and combatants indiscriminately, endangers the human environment in a manner which threatens the entirety of life on the planet. And violate Universal Declaration of Human Rights.
The intend of this paper is to demonstrate that "Atoms for Peace" is a false and unethical enterprise, and offers a set of insights into the social and ethical aspects of nuclear power development. Unethical nature of nuclear weapons and its breading grounds of nuclear power plants, along with examples of ethical dilemmas of nuclear industry and IAEA's codes of ethics will be disused.

S 2.3. Media about Polish Nuclear Power Programme

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Abstract

On 28 January 2014 Council of Ministers has adopted the Polish nuclear power program (PNPP). It is evident that the introduction of nuclear power into the national power system requires public support.
The public acceptance of PNPP can be attained by carryingout a wide information and education campaign. Important role in that campaign play the media.
The aim of that presentation is to demonstrate the activity of the Polish media focused on nuclear power and in particular on PNPP. To reach that purpose the broad review and analysis of the media materials was carried out. The activity of the institutions and organizations being the sources of information have been also analysed.
Beginning with 2009, in Poland a series of informative and educational actions have been implemented to enhance public knowledge on nuclear power. As from March 2012, the Ministry of Economy inaugurated an information campaign entitled Poznaj atom. Porozmawiajmy o Polsce z energią [„Get to know the Atom. Let's talk about Poland with energy"], aiming at providing the Poles with current reliable information on nuclear power and technologies as well as on ionizing radiation. The campaign included a number of actions making use of traditional (the press, radio, publications) as well as modern communication tools (social media, social debates). A website was launched (www.poznajatom.pl), along with the campaign's profiles on community portals (Facebook, Twitter). Advertising campaigning was carried out in the media and a number of educational publications were issued, including newspapers' thematic supplements. Moreover, there were numerous debates, seminars, lectures and meetings concerning the implementation of PNPP. Additionally, the potential investor pursues his informative and educational actions, mainly on a local level.
The National Atomic Energy Agency (Polish nuclear regulatory authority) also carries out its information activities, as required by the law. Knowledge on nuclear power is proactively popularised by the National Centre for Nuclear Research, the Institute of Nuclear Chemistry and Technology (INCT) as well as by certain universities or colleges.
Examples of use by media the information given by different mentioned above stakeholders are presented. Special role of social media is underlined.
Among conclusions mentioned in the presentation one of them is formulated as follows: in the process of planning and implementation of nuclear power, a task of real importance will be to pursue reliable and professional informing and popularising actions based on the best practices, with support from companies specialising in mass communication.

S 2.4. A Review of the Generic Design Assessment (GDA) Dialogue Pilot (2015) for New Nuclear Build in Anglesey, UK: Lessons for Engagement Practice, Contributing to a Theory of Social Sustainability for Local Communities

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Abstract

We have argued previously that a community led, asset based approach is required to achieve any sense of how social sustainability can be defined in a community setting within the context of energy developments. Our approach aims to initiate a lasting change within 'energy' communities through building social capital; focusing on community assets not deficits, in a journey to define their social priorities. Through deliberation, we develop an understanding and self-awareness of social sustainability so that a community is well placed to enter discussions with government and industry regarding large energy developments that will directly affect them.
In this paper we review the 2015 Generic Design Assessment (GDA) pilot public dialogue process for potential new nuclear reactors in the UK, focusing on the Island of Anglesey in North Wales. We examine the aims and objectives of the dialogue, giving particular attention to a comparison between the national sampling of citizens for the GDA and the local community, deliberative approach we have proposed previously.
We review the local concerns expressed by community stakeholders in Anglesey, directed towards other recent energy consultations (Horizon, National Grid), particularly regarding a reported lack of detail on likely local impacts of new energy infrastructure.
We reflect on the limits of existing engagement practice for large energy developments when discussing community priorities and local impacts on the Island, recommending best practice that clarifies the role of engagement and that of the planning process. In addition, we reflect on the role of the community in energy decision making drawing on the potential conflict between national energy policy and the priorities of communities local to the proposed development.

S 2.5. Illicit Nuclear Materials Incineration in Izmir, Turkey

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Abstract

This paper offers a brief chronicle narrative of unethical conducts of the Turkish Atomic Energy Authority (TAEK), current promoter and safety regulator of nuclear industry in Turkey. The Turkish government and its subordinate office TAEK repeatedly violated the established IAEA's the Code Ethics for Nuclear Operating Organization during the public participation process for the Environmental Impact Analysis proceedings in Mersin where a Russian designed and financed nuclear power plant will be built. This paper also enlightens huge amount of clandestine sensitive radioactive waste materials that have surfaced in a lead incinerator factory located in Izmir, Turkey.

Since 70 years, a lead recycling/repossessing factory located in Izmir, produced an average of 4 tons of pure lead every day. The non-economical waste known as "Bottom Ash" was dumped on the factory's landfill site. During certain periods of operation, commercially valued Bottom Ash was stored in a warehouse only 200 yards from a public school, and periodically shipped to different repossessing facilities to recover remaining valuable metals. In April 2007, a truck loaded with the valuable bottom-ash-waste from ASLAN's incineration factory, triggered radiation monitoring instrument at the gate of the IZAYDAS reprocessing factory, IZAYDAS has informed TAEK.

TAEK experts surveyed the land filled site as well as the storage buildings. They reported that 20-300 microRad/hour of radiation were detected throughout the site, especially high readings of more than 300 micRad/hr were recorded in the storage building containing about 1100 tons of commercially valuable waste. In 2008 TAEK issued a press release (No: 04/2012) on its official website confirming that the radioactive isotopes of Europium-152 and Europium-154 which were concentrated in the commercially valuable waste.

Millions of young children and adults have been subject to not only chemical toxic fumes but an unknown degree of radiation. There have been a great deal of health complications among the local residents; and explosion of handicapped children who were born within this area. Fumes and smoke continue to come out of the landfilled area, after a heavy rain, bright flames coming out of the ground. So far, numerous complaints filed to the Ministry of Environment and City Planning, and local Turkish courts are still not resolved.

S 2.6. Nuclear Fission: Economically Sound or Inherently Unsafe? Theoretical Background on and Overview of the Framing of Nuclear Fission

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Abstract

Public debates on nuclear technology are multifaceted and complex, especially when it comes to risks and benefits. Mass media play an important role in depicting the technology, by framing it as a problem or as a solution to their audience.
Method: Framing is making some aspects of an issue more salient, while minimizing or omitting others. Nuclear fission, for example, can be presented as a very polluting source of energy (when considering nuclear waste) or a very clean one (when considering CO2-output). Frames seek to problematize an issue, since problems are more likely to draw attention. As such, problematized issues have a higher news value and a higher chance to get on the public agenda. However, (constant) problematization can also be problematic, leading to negative stereotypes or stigma. Counterframes aim to present the issue as non-problematic.
Purpose: This research aims to investigate the frames and counterframes of nuclear energy technology. The counterframes of this technology have rarely been studied. This study also takes into account new views on and perceptions of nuclear energy, such as its possible role in combatting climate change, and the Fukushima nuclear accident. It uses examples from the Belgian context to illustrate frames and counterframes.
Findings and conclusions: Based on an overview of media framing analyses, this paper gives a theoretical background for an in-depth analysis of the contemporary media presentations of nuclear energy technology. Further, this study indicates the importance of a well-balanced risk/benefit public communication for a more nuanced image of the effects of ionizing radiation, which could possibly lead to changes in public policy.
Future research: Similar framing/counterframing-analyses for other nuclear technologies, such as medical applications and nuclear fusion, can be conducted to give insight in how differently (or similarly) they are presented to the public. The results of this study and future framing analyses could additionally be used in studies regarding framing effects, as a way to give the frames used in experiments more external validity.

S 3.1. The Radiology Informed Consent Form: Recommendations From European Society of Cardiology

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Abstract

According to the recent position paper of the European Society of Cardiology on medical radiation, in radiological informed consent, the communication of doses and risks is often based on a highly specialized technical language, often difficult to understand even for practitioners and radiologists. As a result, both patients and doctors often are unaware of what they are doing, in terms of doses and radiation risks. The informed consent form should spell out, in tabular form and possibly with a figure, the specific reference dose. The jargon information should be translated into mSv, equivalent number of chest radiographs, and equivalent periods of natural background radiation. Effective dose has the advantage that it is not modality-specific and can be cumulated between different imaging modalities over time. After the examination, the actually delivered dose should be stored in the patient's and laboratory's records. The patient should be provided with dose information if he/she asks and this has become a requirement enforced by law in many countries. This simple consent process will gently force the doctor to learn what he/she already should know, enabling him/her to make more responsible choices.

S 3.2. Use of Ionising Radiation for Medical Purposes: What is the Risk Perception of Hospital Personnel?

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Abstract

This work summarises the results from a study of risk perception among hospital staff (doctors, nurses, technicians, hospital physicists) working in radiology, radiotherapy, nuclear medicine or emergency units and being professionally exposed to ionising radiation. The data were collected with a questionnaire distributed to five major hospitals in Belgium and filled in by 81 respondents on a voluntary and anonymous basis. Results show that almost half of the respondents perceived the risks due ionising radiation in their working environment as low or very low, while a third perceived these risks as average risks. Ionising radiation risks account for about one third of the perceived job risk. However, the non-nuclear job-related risks in the hospital environment are almost equally important in explaining the perception of the overall job-related risk. Next, a relation could be established between the use of individual or collective protection means and the perception of ionising radiation risks at work. The more the respondents say they use the protection equipment, the lower is their risk perception. Finally, a comparison was made between the hospital staff and a large sample of the Belgian adult population (N>1000) representative with respect to province, region, level of urbanisation, gender, age and professionally active status. The results from this study indicate that the risks from medical X-rays for an ordinary citizen of Belgium are perceived lower by the hospital staff population than by the general population.

S 3.3. Low Doses of Radiation – Hot Spot in Dose Perception and Radiological Protection

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Abstract

Perception of radiation is considerably diversified in the society depending on whether one is professionally connected to ionising radiation (IR) or not. Professionals do not feel anxiety and rather prone to show a nonchalant attitude to the potential effects of radiation. On the other hand, the rest of the society tend to be oversensitive to the harm that IR can cause. The field of the dispute mostly concerns low doses, as their effects are a matter of debate even among scientists.

In 2010 the MELODI: Multidisciplinary European Low Dose Initiative - research platform was founded. The mission of MELODI has been to coordinate and promote the European research on the risks associated with low-dose exposure to IR. As of June 2014; MELODI has 30 members from the national bodies responsible for defining, funding and implementing research in this domain, as well as universities and institutes committed to contribute to the R&D efforts. The MELODI states that the R&D in the low-dose exposure area is crucial for the European society: although much is known about the quantitative effects of exposure to IR, considerable uncertainties and divergent views remain about health effects at this dose range.

In 2012, UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation) issued the guide: "Biological mechanisms of radiation actions at low doses". In this capacious document, comprising the overview of the state of the art in the field of low-doses there is a following definition of low IR doses: 100 mSv and less, accompanied by a strong suggestion that there is no induction of cancer below that limit.

That UNSCEAR document and some recent scientific findings pushed many radiation protection specialists to claim that in fact, low-dose radiation should not be considered in terms of risk or harm any more. Recently, S.A.R.I., a group named Scientist for Accurate Radiation Information has proposed many initiatives, e.g. Statement "No Reason to Fear Low-Dose Radiation", a document which one can sign considering the radiation protection legislation as being too strict. In Poland, the Nuclear Power Program has been started several years ago and there is a non-official, backstage atmosphere to contest the LNT hypothesis and the risk of low IR doses.

The main problems of the low-dose radiation will be addressed, such as the LNT hypothesis, hormesis, cancer induction, high background radiation areas, children susceptibility and epidemiological studies.

S 4.1. Stakeholder Involvement and Communication in Environmental Remediation and Decommissioning – A Driving Force for Enabling a Successful Implementation

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Abstract

The understanding of the concept of decommissioning or environmental remediation (D&ER) is usually different amongst technical and lay people. Often the expectations of the public deal with the complete removal of the contamination i.e. returning the site to the conditions prevailing before the contamination took place. However, this would mean that in some situation D&ER activities would need to go far beyond what could be seen as necessary if only scientific based assessments were taken into consideration. Therefore, the difference between remediation, clean-up, restoration and rehabilitation needs to be clearly communicated and understood by the public so that cost-effective D&ER activities can be put in place. However, it needs to be recognized that these activities have also important and legitimate societal and psychological aspects that are equally central to the decision making process. Therefore, the IAEA pays a lot of attention on how to assist its Member States in involving representatives of the civil society, local population and other stakeholders in decision making processes. Outcomes of the IAEA work are the reports on 'Communication and Stakeholder Involvement in Environmental Remediation Projects' and the one on 'An Overview of Stakeholder Involvement in Decommissioning'. Another initiative is the ongoing CIDER Project – Constrains in Decommissioning and Environmental Remediation. The project started with a survey that was aimed at identifying the most relevant obstacles to D&ER implementation in different countries worldwide. Communication and involvement of stakeholders in the decision making process was one of the constraints reported as of high relevance by many countries, especially those with more advanced remediation and decommissioning programs. Therefore, in the scope of this project, different stakeholder issues were identified and approaches to overcome the associated problems, which invariably lead to retardation and escalation of costs in project implementation, were proposed. The purpose of this presentation is to highlight the major societal constraints that some organisations in different IAEA Member States may encounter when implementing D&ER programmes. These constraints are: i) limited technical knowledge and understanding of the problem and process by stakeholders; ii) groups and individuals opposing project implementation, iii) the 'Not In My Backyard' (NIMBY) syndrome - with particular importance for the disposal of generated wastes from D&ER operations, iv) different demands and concerns between stakeholders, v) limited budget to cover stakeholders demands, vi) negative experience with previous D&ER programmes, vii) lack of support by the Governmental authorities to implement D&ER, viii) changing administrative procedures and legal framework, ix) lack of trust between stakeholders, x) lack of recognition of links between environmental, economic, and social concerns. In this paper, different strategies to address or overcome the above constraints are discussed along with collected examples of existing practices related to the integration of societal aspects in D&ER programmes worldwide. Real situation (case-studies) are also presented.

S 4.2. Oversight of a Deep Geological Repository: Demands and Expectations from Local Communities

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Abstract

The 2013 recommendations of the International Commission on Radiological Protection apply to geological disposal of long-lived solid radioactive waste. A crucial factor that influences the application of the protection system in a geological disposal facility is the level of oversight or 'watchful care' that is present (ICRP, 2013). The ICRP recommendations (2013) also state that "decisions related to the organisation and evolution of the oversight should be discussed with stakeholders". The concept of oversight can provide a useful conceptual framework that embraces long-term monitoring and societal engagement as parts of a unified whole. Monitoring – by collecting, interpreting and keeping data on a continuous basis – serves the purpose of preserving records, knowledge and memory. The OECD/NEA Radioactive Waste Management Committee international Project on "Preservation of Records, Knowledge and Memory Across Generations" (RK&M) addressed the concept and role of monitoring in the different stages of the geological disposal facility as well as the technical expectations and societal challenges (2014). This paper presents the work undertaken by the NEA Forum on Stakeholder Confidence (FSC) which contributed to the RK&M project by exploring the local communities' expectations and demands on monitoring and the preservation of records, memory and knowledge of a deep geological repository. A literature review, a questionnaire survey and several interviews were conducted to explore the extent to which local communities might play a role in the monitoring process, as part of a general oversight approach. The implementation of a disposal project can be viewed as an incremental process, following the pre-operational, operational and post-operational phases. Throughout the different phases, there may be, in parallel, measures to monitor that are not strictly technical, or that may be technical but are carried out by other players than the implementer or the technical regulator. Thus, to the extent that oversight is a general term for "watchful care" and refers to society "keeping an eye", it is important that a programme includes planning for dialogue to periodically renew the basis of understanding among stakeholders.
The study revealed that further research is needed, focusing on the extent to which monitoring could contribute to confidence in geological disposal and how local communities may be involved in oversight activities.

S 4.3. Interdisciplinary Perspectives on Dose Limits in Radioactive Waste Management: A Research Paper Developed within the ENTRIA Project

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Abstract

ENTRIA ("Disposal Options for Radioactive Residues: Interdisciplinary Analyses and Development of Evaluation Principles") is a joint research project funded by the German Federal Ministry of Education and Research (BMBF) and carried out by 12 departments from German universities and major research institutions and one partner from Switzerland. The scientists participating in ENTRIA represent natural sciences, civil engineering, philosophy, law, social and political sciences, and technology assessment. Recognising that all these disciplines need to interact when radioactive waste management is concerned, the project aims at investigating and developing evaluation principles for three options to manage especially high-level radioactive waste: Deep geological
disposal without retrievability provisions, emplacement in deep formations with monitoring and retrievability, and prolonged surface storage. Initiated by the ENTRIA working group "Technology Assessment and Governance" and recognising that dose limits for the operational and postoperational phases of management facilities are an issue of utmost importance and concern when addressing both technical and governance aspects of disposal options, ENTRIA scientists developed a research paper aiming at an interdisciplinary synthesis of technical, sociology of knowledge, legal, societal, and political aspects. The paper comprises a set of 14 propositions addressing technical andnon-technical drivers in definitions of dose limits, perceptions of radiation effects and dose limits, and controversies about the meaning and role of such limits. It elaborates on the technical and nontechnical drivers. In doing so, it recognises that such limits are indispensable for technological development and legal security but often have a contra-productive effect in communication, political, and governance contexts. In order to better understand the coproduction and interdependencies of these various contexts, future interdisciplinary research needs to address the relationship between dose limits and risk perception as well as the role of confidence and trust. It should aim at a discourse based communication about underlying values, objectives, actors and procedures when defining limits, and potential alternatives and complements to established limits.

S 5.1. Communicating about Risk Following a Nuclear Incident

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Abstract

We have always lived in a world where there are numerous risks both natural (e.g. tsunamis) and technological (e.g. mining disasters), but threats associated with nuclear science are often particularly feared, due to the 'invisible' and long lasting effects of radiation and the difficulties in explaining risk to wider publics. Following a nuclear leak, technicians – as well as other disaster victims- are frequently personally blamed even for the most unforeseen accidents (e.g. following a tsunami), with serious effects for their psychological (and sometimes physiological) well-being. Both informal social networks and traditional and social media can spread perception of threat far beyond an accident site, even when actual threat is relatively small. This makes communication between health professionals and stakeholders problematic, as emotions become 'contagious' across a wide area. In this presentation I build on our work from both the Fukushima incident and other large-scale threatening events (hurricanes, typhoons etc.) to identify some key factors influencing both the psychological dynamics of an accident site and the ways in which incident risks are communicated between physicians and members of surrounding communities. In doing this I emphasise the ways in which effective communications need to build on existing knowledge about shared fears in a community and wider culture, and that simple 'top down' messages that fail to recognise these values and representations are often treated with distrust and suspicion. Building on our work on scapegoating after disasters, I identify vulnerable groups that might need particular attention and professional support following a nuclear incident. Finally I consider mechanisms to sustain community interventions following an accident, enabling productive dialogue between health professionals and affected populations and facilitating effective health interventions.

S 5.2. Dealing with Uncertainty: Involving Citizens in Emergency Planning in a Nuclear Municipality

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Abstract

Emergencies are prepared for through emergency plans on different levels and by actors ranging from governments to plant operators. In the case of nuclear emergencies, the purpose of these plans is to be as prepared as possible for situations that are statistically exceptional and difficult to foresee. However, accidents as the one at the Fukushima-Daiichi plant show that things can and do go wrong and that one can never be prepared enough. Nuclear reactor sites and waste storage facilities can be understood as both prone to normal accidents (Perrow 1984, 1994), and operating as a high reliability organisation (HRO) (Rochlin 1993, Roberts 1990). As Schrivastava et al. (2009) argue, these are complementary concepts, which can be bridged by Turner and Pidgeon's (1997) theory on disaster incubation.
In this paper emergency planning will be framed as an approach to dealing with uncertainty (Furedi, 2009) in the light of risk governance (Renn, 2008) and building critical trust (Walls et al. 2004). Emergency planning for incidents that involve radiation and nuclear installations deals with uncertainty in a field of highly stigmatized technology (Gregory et al. 2001). Not only is the source of risk highly controversial but countermeasures also need to be evaluated from a radiological stance and from social, political and economic points of view (ICRP, 2007). Such plans become instruments for interaction with neighbours and other concerned actors, and thus more likely to be exposed to criticism and debate. Drawing from a case in which Belgian citizens were involved as stakeholders in nuclear emergency planning, the utility of this participation and its provisional results will be discussed.

S 5.3. Right to Accurate Information in Nuclear Events – Do We Need a New Codex?

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Abstract

In all nuclear events in the last decades the main problem was timely and accurate information about the events within the nuclear plant. In fact there is a conflict between the right to timely information and the wish to prevent unnecessary panic within the uninformed public. We can't deny that the stories about the disasters (real or surreal) are the bestsellers. So we can understand that the newspapers are daily seeking for the breaking news even if they aren't 100% checked. On the other hand nuclear plant operators and responsible authorities' deals with "catch 99." There is no clear line where the events within the nuclear plant aren't any more manageable and the path to nuclear disasters begins. Published stories after the disasters showed that operators and authorities delayed with the information on the basis of their perception that situation are still manageable ant that it's not the time to inform the public with all the consequences. Submission is divided in three parts.

First part deals with different actors involved into nuclear industry and their legal and economic interests. This part deals with questions such as:

- conflict between different rights among different actors;
- limits of freedom of speech in the case of unwanted events;
- right to information in critical events;
- responsibility of different actors for the damage caused by inaccurate information;
- border between sc. technical problems and nuclear events.

Second part deals with the question of state regulation and self-regulation. It discuss about pro and contras of each type of regulation. We look to the limitations of state regulation and self-regulation. This part deals also with the possible models of self-regulation.

Third part deals with the question of journalist ethics code. We examine if the existing rules that regulate journalism provide accurate information to the public also in the case of unwanted events. This part investigates the question whether the new codex valid for all payers in nuclear industry is needed and how the supervision over such code should be established.

S 5.4. Evacuation in the Case of Nuclear Disaster: Research Findings on Planning and Communication

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Abstract

The paper is based on the results of the research project 'Preparedness for Evacuation in the Case of a Nuclear Accident' accomplished by the Defence Research Centre at the Faculty of Social Sciences, University of Ljubljana in 2012.
Previous research into evacuation in the case of a nuclear disaster suggests that there are both a high degree of uncertainty about the actual implementation of plans as well as a need for the continuous study of the human aspects of nuclear emergency preparedness. Drawing on the results of a textual analysis of the Regional Plan, a survey of the inhabitants and interviews with representatives of the institutions located within the area of greatest potential threat, our paper seeks to establish the extent to which the population and institutions are prepared for an evacuation in the event of a disaster at Krško Nuclear Power Plant, in Slovenia. Our analysis reveals that, despite planning, communicating and training, almost three quarters of the population living within a three-kilometer radius remain unfamiliar with the locations of the reception centres; and two thirds of them are unfamiliar with the evacuation routes. Research findings strongly emphasize the importance of communicating the appropriate message to the population concerned. As far as the institutions are concerned, the level of preparedness is also low due to a fatalistic attitude ('if the disaster occurs there will be no time to evacuate'), poor nuclear disaster planning, the low attendance of personnel at training sessions, poor coordination, and scarce attention and resources devoted to the management of a possible disaster.

S 5.5. Emergency Preparedness and Response Provision in Europe: Findings and Recommendations of Nuclear Transparency Watch

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Abstract

In reaction to the lack of adequate assessment by the European Commission (EC) and European governments of the lessons to be learned from the 2011 Fukushima catastrophe concerning current nuclear emergency preparedness and response, one of the first steps of the Nuclear Transparency Watch (NTW) was to establish the working group (WG) on Emergency Preparedness and Response (EP&R). The aims of the WG were to carry out an evaluation of the existing European and national EP&R provisions from the civil society point of view, to inform the public on the findings and to provide guidance for further activities of the interested public. The working group collected information on EP&R provisions in Europe and Ukraine and made analyses based on the following methods and sources: desk work reviewing the national provisions and international requirements; interviews and questionnaires with representatives of responsible institutions and members of local populations, trans-boundary round tables involving the participation of responsible institutions and civil society, international seminars with expert institutions and international associations as well as the available investigations performed by the European institutions. In this position paper the main findings, viewpoints, recommendations and proposals of the members of the EP&R Working Group are presented. It has been revealed that the usual top-down approach which has been used to date in EP&R should be changed and that local populations and interested civil society organisations should be involved in this development. This would be the best cure against sectoral "silo thinking" and in particular, the problems properly defining the responsibilities of civil protection on the one hand and the safety and radiation protection authorities on the other. Public participation would also increase the scope, reduce the use of false or outdated presumptions and/or data, steepen the learning curve necessary after the Fukushima experiences and overcome cross-border obstacles. Current limitations due to a certain "tunnel view" based on a reluctance to include the unexpected need to be overcome if the complexity of nuclear emergency situations in real world settings is to be addressed. The European Parliament, the European Commission, national governments, regional bodies and municipalities should therefore together with nuclear operators provide access to relevant information as well as support participation in emergency preparedness and response planning of interested citizens, citizens' initiatives and civil society organisations (CSOs) regardless of their general position on the commercial use of nuclear power.

S 5.6 Eagle findings related to communication and stakeholder involvement in nuclear and radiological emergencies

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Abstract

In order to foster a move towards the ideal of citizen-centred communication, including a participative component, the EAGLE project identifies and disseminates good practices in information and communication processes related to ionising radiation throughout its activities. The focus of the project is on communication about ionizing radiation in daily life e.g. industrial and medical applications as well as natural radiation for example radon gas. However, communication about ionising radiation in general is strongly linked to a nuclear or radiological emergency communication. This presentation gives an overview of findings related to communication and education, training and information material for nuclear emergencies preparedness and response. Methods used in the research are qualitative and quantitative: focus groups, dialogues, interviewees, workshops, public opinion surveys and overviews of a research conducted in different European countries.

Results from dialogues with editors and journalists conducted in France, Poland, Romania and Slovenia confirmed, that emergency communication is newsworthy, while information about application of ionizing radiation in daily life does not attract a lot of media attention. The journalists pointed out the lack of verified and fast information during an emergency. For instance, journalists from Romania stressed that the desire to have more and more news inclines to introduce "pseudo-information" in media and also "pseudo-experts" in debates, interviews, etc. (including fortune tellers, astrologers). Additional challenge stressed by the journalists is language used by authorities or emergency experts. For instance, French journalists indicated that at the time of the Fukushima accident, words such as "cloud or significant contamination" were loosely employed by authorities (both Japanese and French). The journalists stressed that they lacked reference points to help understand the information presented. In France also it was noted, that "in the case of nuclear accident, there is so much uncertainty in the first hours and days that with or without basic knowledge, people probably cannot take informed decisions".

The EAGLE project overviewed some selected curriculums at schools in Europe in order to identify some general basic knowledge about ionizing radiation. Results show that while the time dedicated to ionising radiation concepts is rather limited in primary and secondary schools, the curriculums in EU countries mainly include limited topic related to the nuclear accidents. For instance in Cyprus and Romania physics classes include lesson related to causes of nuclear accidents and protection measures with the Chernobyl accident as illustrative example.

The results of a mental model research, conducted in five European countries; Hungary, Slovenia, France, Romania and Poland show that 'Radioactivity' carries immediate associations with nuclear accident (or in a few cases, with military applications). The radioactivity concept also elicits some degree of anxiety. In general, the participants explained the interaction of radioactivity due to a nuclear accident at long distance e.g. Chernobyl and Fukushima on European territories well. Many interviewees correctly described the process of radioactive dust spreading across the wide area around the source, finally falling to the earth surface with rain or snow. Some people believe that the radiation due to a nuclear accident can spread on long distances with waves – although they are not very strong any more, they my travel very long distances. The elder Romanian respondents were more knowledgeable about spreading of the radioactive dust than participants from other countries probably due to their experience with the Chernobyl accident.
Through scientific research overview, EAGLE emphasizes that the knowledge is only one of the dimensions of the communications with public. Many researches proved that the most important factors influencing decisions are not the one linked with how much people know about ionizing radiation but those linked with perception of risks due to different activity or technology, trust, involvement of the people in the process and opportunities for participation in decision making. This should be constantly taken into consideration and also applied in the communication strategies from different sources providing information to the lay population.

On one hand, the EAGLE public opinion surveys representative for Belgian, French and Slovenian populations conducted in 2013 and 2014 show that nuclear accidents and radioactive waste are evaluated as the most risky among the domains evaluated. Despite their high risk perception, nuclear accidents are on top of the confidence scale as regards the high confidence in nuclear accident management by authorities. On the other hand, more than 50 attendees of an international EAGLE workshop in 2013; 24 coming from sources of information, 17 representing general public and 10 coming from media sector felt that in most countries poor and irregular communication over time on the part of authorities has broken public trust. There appears to be a strong perception that communication by authorities is driven by interest and that they are often concealing or holding back the truth. The participants expressed that one inherent problem in the safety philosophy of institutions is that they do not communicate to the public the whole truth, i.e. that accidents (such as meltdown) are possibilities that could actually happen. In some cases the more minor incidents are not reported at all, they concluded.

An e-survey conducted at 47 organisations from 18 EU member states; nuclear power plants, medical institutions, regulatory organisations, waste management organisations and technical support organisations confirms that these institutions are indeed not pro-active in communication about accidents. Almost half of the responding institutions communicated about the Fukushima accident upon demand from the media or the public. The topic of communication shifted from the initial worries about the health and environmental impacts in the directly affected areas and in the responding country to the long term health and environmental effects and impacts on nuclear energy policy. Psychological impacts seem to have been less important. After some time the issue of impacts on nuclear energy policy became more important. However, the strategy of communicating after the Fukushima accident has not substantially changed. The organisations consider that their way of communication is satisfactory for standard situations, yet that they have problems in managing crisis communication in the case of infrequent and unexpected events like nuclear incidents and accidents.

S 6.1. Why Nuclear Engineer should not Complain about Skewed Risk Perception

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Abstract

The perception gap between ionizing radiation risk and fear is compared with similar perception gaps that can be found in the society. The attitude toward radiation is weighted against the attitude toward Genetically Modified (GM) food and drugs. Being a nuclear engineer myself, I might not be the right person to give an unbiased view on the radiation risks and fears. But I can hopefully give a neutral, although a less scientific view on the GM food and drugs. Outside view might give the members of the nuclear community an opportunity to feel the risks and fears through the eyes of an "ordinary" human. Different perspective might give us, nuclear professionals, some kind of consolation in a sense that radiation perception gap is not the deepest and the most irrational one. And while this kind of consolation is not particularly useful, different perspectives might help us to adjust our public communication.

S 6.2. Public Perception on Education and Information about the Ionizing Radiation Across the EU

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Abstract

Understanding the general public concerns and requirements related to the ionizing radiation (IR), as well as the weaknesses of the current practices represents the first necessary step in the improvement of the communication towards the general public and was the main purpose of this work. The paper gives a general view of the European current status of the education, attitudes, opinions and feelings, based on the review of the available information on the general public perception related to different aspects of the IR (nuclear energy, radioactive waste, X-rays and radioisotope medical use).

The Eurobarometer surveys performed during 2006–2009 offered rich information on the public attitudes and beliefs, confidence in the authorities and nuclear actors, satisfaction with the school education and with the information received from authorities and from mass media. Works performed in Slovenia and Romania in IR field allowed an in-depth assessment of the knowledge level and attitudes of different social categories. Detailed data on the Physics curricula related to IR was collected from different EU countries based on a dedicated questionnaire to capture its large diversity.

Information on the education provided to the children in the school illustrated large differences between curricula across the EU. Eurobarometer surveys clearly indicate a general consensus that schools do not offer sufficient information to provide children with basic knowledge of energy and nuclear issues. Self-assessed knowledge about different nuclear issues at European level is modest, but somewhat higher in the countries with nuclear power programs.

A very large part of the population feels uninformed about IR and their applications, and considers the information the media offers is not sufficient for them to have an informed opinion about the risks and benefits of energy choices in general, and nuclear in particular.

There is thus a clear demand for better information and communication about these issues. Improving this process should consider that trust in information about IR and its applications is higher if this is provided by independent scientists, international organizations working on peaceful uses of nuclear technology and national safety authorities, and traditional mass media remains the major source of information, but the social media started to increase its share when information on IR is looked for.

S 6.3. Towards Improved Public Perception of Nuclear Safety through Strengthened Role of Research and Higher Education

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Abstract

The electricity from the nuclear fission is abundant and competitive low carbon energy having one of the lowest impacts to the public health and environment. As such, the nuclear energy could immediately provide significant contributions towards the neutralization of the threats caused by the climate changes. This has been made possible through the substantial and long term efforts of the nuclear industry to sustain and improve the safety of the nuclear power plants. These efforts were systematically supported and sometimes also lead by the competent regulatory authorities and academia worldwide, and over the years resulted in unparalleled levels of stability and maturity.

Unfortunately, the dwindling public acceptance has recently become one of the major challenges that face the nuclear industry. On one hand, the very low impact of the nuclear energy to the public health and environment is undoubtedly and thoroughly supported by the available scientific and technical knowledge. On the other hand, the public – especially in the postindustrial societies – tends to disagree, more so with the information provided by the regulators and industry. A recent public opinion poll in the EU indicated that in the questions of nuclear safety people trust scientists much more that the regulators, government, media and industry.

Yet, both the regulatory authorities and the industry in some countries seem to be progressively losing interest for intense cooperation with the higher education and research establishments. Indeed, the already achieved and unquestionable high maturity and stability of the industry and regulators might give rise to a perception that further research cannot bring much added value to the safe operation of the plants and that higher education might be fully substituted by professional training. Such perception may be easily augmented by the economic recession. Ultimately, it might lead to a severe deterioration of the independent nuclear safety related research and higher education, which is considered a fundamental national infrastructure for nuclear safety.

The paper argues that the nuclear energy stakeholders could improve the public trust significantly and at the same time improve the safety record by a much stronger commitment towards the science based decision making in the industry and the regulatory organizations.

S 6.4. Communication of Risk and Public Perception during Fukushima Crisis in a European Non-Nuclear Country: Experts, Non-Experts and Media

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Abstract

In an effort to understand where communication of risk stands in terms of radiological and nuclear emergencies in Portugal, a non-nuclear country,, we analysed the role of the two (experts and non-experts) groups during the management of Fukushima crisis and discuss how risk was perceived by the public and how effective were the risk communication methodologies and channels used by the competent authorities. In the European Union, with a high number of nuclear reactors is in operation in several countries with an impressive safety record, communicating risk is, arguably, still something outside the main stream of the nuclear industry concerns. The way to overcome this caveat is, amongst others, through education and training that also promoting the need to address dialogue, transparency, communication strategies with public and media, besides the scientific and technical curricula. In this paper, a starting point discussion about if, and how, cultural differences between North and South, may influence the communication effectiveness and purpose will be addressed. Views and experiences on all stages of risk (perception, assessment and communication) from a non-nuclear country will be conveyed.

S 6.5. Myths and Reality about Risks Related to Radiation Exposure
Subtitle: A practical Approach to Science-Based Communication about Ionising Radiation without Reinforcing the Radiation Myths

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Abstract

For more than half a century it has been generally accepted that any kind and any level of radiation represent a hazard for human lives. From the premise that democratic societies should base their decisions on accurate, objective, and science-based information and reasoning, there is an urgent need to confront some of the prevalent myths regarding ionising radiation with scientifically supported knowledge as this can lead to increased social welfare. This challenge should be tackled on the level of: 1.) public policy decisions, 2.) citizen's welfare decisions and 3.) organisational decisions (involving organizations form energy sector, industry, research and others that use nuclear and/or radiation technologies in their production/research processes, and regulatory/decision-making bodies).
In this paper we discuss two issues concerning the misleading information about radiation: how it has penetrated into many parts of the worldwide community, and how to reduce its misleading influence on the society.
We apply a general effective-debunking methodology developed by Cook and Lewandowsky (2012) to the ionising radiation myths. This requires clear communication of (a) core facts regarding radiation levels, doses, their biological effects etc., (b) explicit warnings (that the upcoming information on radiation is false, i.e. a myth), (c) alternative explanation for why the radiation myth is wrong and why the misinformers have promoted it in the first place, and (d) (info)graphic material that clearly displays the core facts regarding different radiation aspects (doses, biological effects etc.). This debunking methodology is then applied to three radiation myths: (1) »There is no safe dose of radiation.«, (2) »Normally operating nuclear power plants emit dangerous amounts of radiation which causes cancer and other harmful effects.«, and (3) »Radioactive waste presents a huge risk to human health which is technically impossible to manage«.
Further practical research and communication work is planned by the co-authors, together with possible other expert partners, to apply the debunking methodology to a broader list of key radiation myths and to publish their work as a »Radiation debunking handbook«.

W 1.1. 2nd Workshop on "The meaning of Ethics for Radiological Protection Research and Research Policy"

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Abstract

The workshop will be organised as a joint reflection on the meaning of ethics for radiological protection research and research policy, and this for all relevant application contexts (nuclear energy, medical, industry). The focus will be twofold: the first will be on a mapping of the possible meaningful notions of ethics in relation to RP practice, research and policy, taking into account that ethics should not only be understood as the 'ethical implications' of potentially adverse effects of applications of nuclear technology, but also (and primarily) as the ethical aspects of the justification of practices that involve nuclear technology; the second will be on how insights on the meaning of ethics in RP context can inspire form and content of ethics courses to be integrated in existing education and training programmes (devoted to radiological protection, nuclear engineering and medical applications).
Formal input to the workshop will come from

- A synthesis of the discussions from the first workshop on "The meaning of ethics for radiological protection research and research policy" organised on 9 October 2013 during the 5th MELODI workshop in Brussels;
- Answers to the questions on ethics formulated as part of the OPERRA e-survey on research priorities;
- Two invited presentations.

Dialogical input will come from a roundtable discussion with all participants.

W 1. 2. Ethics, Uncertainty and The Culture of Radiation Protection in Medicine

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Abstract

Both ethics and the culture of radiation protection have received much attention during the last few years. In practice, the ethical system professionals use and the culture they operate out of often functions at a level below awareness and consciousness. This is particularly so in radiation protection, when dealing with uncertainties that arise with medical exposures.
This paper will review some aspects of the deployment of ethical considerations when dealing with diagnostic medical exposures in radiology and nuclear medicine. It will emphasise the need for a more questioning approach to ethics at a conscious level. Examples will be given that can seem reasonable within the culture of the professionals involved, but about which serious doubts arise when they are examined in the context of the uncertainties present and of prudence. An example from a formal statement issued by a prominent professional body will be used to illustrate this.

W 1.3. How to Deal with Uncertainty? Stocking the Toolbox

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Abstract

The presentation will expose the notion of uncertainty in science in general and coming from a philosophy of science perspective in specific. Different examples from the scientific dealing with uncertainty are presented. First, the examples from different scientific disciplines to give the participant a feel of how decisions are made under uncertainty, and second, the examples directly collected from the first days of the RICOMET conference. As a conclusion, several means to help make decisions under uncertainty will be presented, hence the reference of the toolbox, in order to make decision-making process by scientists and individuals from a general public easier.

PP 1.1. Incorporating Values into Decisions for both Ionising and Non-ionising Radiation Protection: the Importance of Risk Perception and Effective Communication

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Abstract

Public perceptions of risk from exposure to both ionising and non-ionising radiation share a number of common characteristics. Chief among these are fear of potential for both acute, short-term and for stochastic or long-term health effects. However it has also become apparent that perceptions of the trustworthiness and competence of those responsible are key drivers. Judgments about the trustworthiness and competence of those responsible are affected by factors such as the apparent level of transparency and control over decision-making processes.

This paper provides an overview of recent projects in Australia where public perceptions of radiation have been influential. The first is in relation to non-ionising radiation – public exposures to Radio Frequency Electromagnetic Radiation (RF EMR) from electricity smart meters. In Victoria, a mandatory programme of smart meter deployment led to extensive opposition, political campaigning and claims of actual harm from exposures. Detailed survey work on actual EMR exposures had to be undertaken by both the health agency and the state government in order to respond to the heightened levels of concern. This response is outlined in the paper.

The second example is in relation to ionising radiation – specifically siting procedures to establish a national radioactive waste management facility (NRWMF) in Australia for Low and Intermediate Level Radioactive Waste. In this case an open and transparent volunteering process has been established. The early stages of the decision making process are described.

This paper concludes that in addition to trust in radiological protection, it is the form of governance - the extent to which public and key stakeholder values are able to influence key decisions such as siting and radiological safety standards – that are most important when seeking to respond to and accommodate perceptions of risk from radiation.

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PP 1.2. Integration of Social Sciences and Humanities into Radiation Protection Research in the Belgian Nuclear Research Centre

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Abstract

PISA, the Programme for Integration of Social Aspects into nuclear research was initiated in 1999 within the Belgian Nuclear Research Centre SCK•CEN to study the societal, political, cultural and ethical aspects of the development and use of nuclear technology and applications of ionising radiation. The programme was launched as the result of an internal reflection acknowledging that insights from social sciences and humanities were required to better explore normative concepts such as precaution and sustainable development, and to understand the factors underlying societal (dis)trust towards nuclear technologies.

Within the PISA programme, research is essentially multi-disciplinary, requiring shared contributions and insights from both natural sciences and social sciences and humanities. We argue that the importance of such programmes is threefold. Firstly, their scientific basis and multi-disciplinary and participatory character contribute to a better understanding of the interactions between science, technology and society, in general, and the complexity of nuclear technology assessment in particular. Secondly, their functioning as (self-)critical policy supportive research and outreach to society are an essential element of decision-making and research policies that aim at generating societal trust in the context of controversial issues such as the nuclear. Finally, they create an epistemologically and socially enriching dynamic in the organisation itself.

Three important themes of the PISA programme are ethics, risk perception and risk communication. These are integrated in radiation protection research in two, interacting ways: i) by conceptual and methodological investigations, oriented towards research in the field of radiation protection; and ii) as "research in action", oriented towards policy support in the field of radiation protection.

The PISA research concerned with an 'ethics of reflexivity' for nuclear technology assessment underlines, among other, the epistemic complexity of knowing and evaluating radiological risks. Against this background it includes a focus on the working of science as policy advice in a democratic decision making context.

Risk perception research within PISA builds on empirical data collected through surveys among the general population in Belgium or specific population groups (e.g. medical personnel, employees of SCK•CEN, first responders in nuclear or radiological emergency management). Such studies aim at assessing and explaining the perception of radiological risks, highlighting the underlying factors, as well as the consequences on subsequent behaviours.

The risk communication research track builds on theoretical models (agenda setting theory, media framing, SARS model, systematic-heuristic information processing) and applies qualitative and qualitative research results to the communication in practice in several domains, including communication about radon, environmental radioactivity, nuclear emergencies, decommissioning or nuclear waste.

Another strand of research underlines the combined importance of ethics and communication in radiation protection. Here we outline the relevance of the established notions of "post-normal science" where facts are uncertain, values are in dispute and stakes are high, and "social experimentation" where a large variety of people are (consciously or unconsciously) involved in the implementation of technologies, while foresight, controllability and monitoring are difficult

and limited. This analytical background also serves to promote the democratization of radiation protection, through the establishment of an “extended peer community”.
The research on ethics, risk perception and risk communication in the field of radiation protection carried out within PISA serves as input for the organisation of stakeholder processes and the formulation of guidance documents at national and international level, these being an important part of the "research in action" activities of PISA. In addition, PISA results are disseminated through training lectures or comprehensive education programmes for professionals in the field of nuclear science and technology, medical applications of radioactivity and various aspects of emergency management and rehabilitation.
This contribution draws on lessons learned from PISA research and policy support and, based on this, suggests future research needs with a view on integrating social sciences and humanities in radiation protection research, practice, and education and training.

PP 1.3. Communicating Safety Culture Within the Radiation Safety Regulatory Authority

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Abstract

Safety culture in broad terms can be defined as the corporate culture in which safety is of paramount importance; values, attitudes, behaviors, management practices form the way in which safety is perceived and pursued by organizations and persons involved in radiation protection and nuclear safety system. Nowadays, safety culture is viewed as a fundamental safety principle and as such starts to be appearing also in legally binding documents (for instance, in the new European nuclear safety directive).

This paper aims to present the work performed by the Greek Atomic Energy Commission (EEAE), the national regulatory competent authority for radiation safety, towards safety culture improvement among its personnel members and management team. The coordinated effort was triggered by the international peer review recommendations (IRRS mission in Greece, 2012); this effort included firstly the composition of a working group with main task the dissemination of the safety culture demands within EEAE. The starting point was an internal survey by the help of a questionnaire, especially developed for EEAE, taking into account methodology in relevant references. The second major challenge was the design, development and building of the EEAE's integrated management system on the foundation of safety culture.

The interaction between the integrated management system and the human and organizational factors makes safety culture a horizontal concept, extending across all lines of the organizational structure. Its complicated nature requires intense communication actions to be addressed internally to the personnel. Thus, safety culture is being acknowledged as one of the most significant pillars of the corporate communication strategy developed and implemented by EEAE.

In the present work we discuss the methodology, the assessment of the survey results, the challenges of communicating safety culture within the regulatory authority and the roadmap for future EEAE plans to promote safety culture among stakeholders.

PP 1.4. Improvements in Public Awareness and Risk Perception in Benefit of the Romanian Cernavoda CANDU 6 NPP

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Abstract

In the nuclear industry, nuclear power plants are at the forefront of the nuclear applications. They are the most visible and most debated member of the nuclear family, being the source of the worst viewed accidents in the power production industry, and almost in all industries worldwide. This infamous reputation comes without doubt from fear of the effects of ionizing radiations resulting from the nuclear power plant accidents, accidents recorded in history or that would result from future nuclear power plant operation.

Uninformed public perception, specially under the influence of mass-media news that have as a subject in general negative events or observations, may associate an extremely negative image to a nuclear power plant. The public perception is especially based on the recorded Three Mile Island, Chernobyl and Fukushima Daiichi accidents. Uninformed public perception can distort the reality, over sizing the real risks and under sizing the real benefits of an industry like nuclear power.

A distorted image leads in most cases to a hostile attitude towards the subject that, corroborated with an unfortunate event, accident or natural disaster linked to it, turns the public opinion against that particular subject. After the Chernobyl accident, public opinion turned against nuclear power in countries like Germany and the nuclear industry recorded a decrease in new power plants construction.

In this paper we are analyzing the institutions involved in public education and training that can generate an image for the public, institutions involved in a strategy for improving public awareness and risk perception for the nuclear industry. We are analyzing the main institutions and entities involved in education, training and knowledge dissemination for the nuclear power plant and nuclear facilities in Romania. These institutions must be part of a strategy for better knowledge management and public information improvement.

We list as the sources for public information high education providers, represented in Romania by public universities, governmental bodies responsible with public communication in nuclear field, nuclear field law institutionalization, nuclear operators, nongovernmental organizations and trade associations. All these interact in an optimized strategy aimed at improving the public awareness and risk perception thru education, training and public communication on the subject of nuclear power plants and nuclear applications present in Romania.

PP 1.5. Communication and Information on Ionizing Radiation as a Tool for Social Consensus around the Construction of New Repositories for Radioactive Waste in Poland

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Abstract

The renaissance of nuclear energy was slowed down by unexpected nuclear disaster in Fukushima. Public concerns about the nuclear power revived again and further development of this method of energy production requires proper communication, education and information. The reliable information should be shaped and delivered by the experts, but the role of mass media is very important, as well. Appropriate communication and information should also accompany all the actions towards development of such nuclear facilities like radioactive waste repositories. The greatest fear of the public is caused by geological disposal of high level waste, however the location of near-surface repositories provokes protests of local communities, too.
In Poland the only active site for disposal of radioactive waste is the National Radioactive Waste Repository in Rozan. According to the classification of the International Atomic Energy Agency (IAEA), it is a surface repository for final disposal of short-lived, low and intermediate level waste, which half-life of the radioisotopes is t<30 years, and for sealed radioactive sources. Good protection against the release of radioactive materials from the repository is the most important for the safe storage of radioactive waste. It is also a key issue to convince the public about the safety of the repository for environment and for human being.
A lot of confusion accompanies the public concerns of radioactive waste repositories. This was revealed by the surveys conducted in the scope of EAGLE project concerning the studies on mental models of ionising radiation. Apart from the fears of migration of radionuclides from disposal sites and the danger of water pollution people are afraid of ionizing radiation. To demonstrate the safety of disposal site the special inspections around the repository systematically check: radiological exposure of employees based on individual measurements, the radioactivity of the environmental components (air, water, soil, and vegetation) and the radiation levels in and around the repository.
Due to the fact that the repository in Rozan will be closed in 2024 - 2029 because of depleted storage capacity, Poland started work on finding location for the new repository of low-and intermediate-waste.
Appropriate way for communication with the society is a very important and necessary condition for development of the repositories in the country. Long term and proactive public involvement may improve the quality of decisions taken by the government and decisive institutions. In order to meet this requirement, the Reference Group, which organized a dialogue in Poland concerning selection of the site for the near surface repository was established in the frames of IPPA Project (Implementing Public Participation Approaches in Radioactive Waste Disposal). One of the activities of RG was organizing the public hearing, the subject of which was: Do we need a new repository for radioactive waste? First of all the hearing was intended to inform all the stakeholders of status of preparations for the construction of a new disposal site. Participants of the meeting could find answers to the questions; allay the concerns about the risks as well as to present their own views and expectations on the topic of storing radioactive waste, safety of repositories and the manner of preparations for the construction of the new facility. IPPA project was the beginning for future projects related to implementation public participation in radioactive waste disposal in Poland. The other project: "Developing a methodology to evaluate

the safety and identify the optimal location of a shallow disposal of low and intermediate level radioactive waste" is presently developed. The consortium working on the project agreed to collect and verify, analyse and evaluate the available archival materials, and carry out the necessary additional research that will enable selection of the optimal location of the shallow repository for low and intermediate level waste. To carry out preliminary studies, the approval of the public is necessary. Therefore, the information campaign and plan of communication with local communities of the potential localizations were elaborated. Some educational activities about ionizing radiation and its consequences are included as well, to dispel the concerns about the actual hazard related to radioactive waste disposal. Many information actions were foreseen to start dialogue with the public to obtain the social consent of site selection.

To sum, communication, education and information on ionizing radiation are tools for informed decision-making and achieving social consensus around the construction of new repositories for radioactive waste in Poland. The society should learn that appropriate social communication is a subject of care of the state, and transparency of the decision-making processes.

PP 1.6. RENEB – Biodosimetry Network – Solution to Enhance Positive Radiation Perception in the European Society

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Abstract

The RENEB sustainable biological dosimetry network consisting of 22 top organizations from 15 European countries is coming to existence. RENEB offers a reliable chance for a fast and trustworthy dose assessment with high throughput that is urgently needed in an emergency situation in the European territory. The work performed by RENEB members, the high capacity, level of experience and top quality should enhance the confidence of both societies and authorities in benefiting from nuclear industry, as well as ionising radiation applications in science and medicine.
A vast variety of methods is at the RENEB network's disposal. The dicentric, micronucleus, gamma-H2AX, translocation and PCC assays, as well as OSL and EPR guarantee fast and reliable radiation dose estimation, necessary in emergency, as well as for medical and legal purposes.

PP 1.7. Influence of Mass Media Channels on Health-Related Risk Perception: the Case of Fukushima

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Abstract

This research provides nuclear emergency communicators with information regarding which media to use in the case of a nuclear emergency and which information to provide to the public, even beyond the directly affected zone. It investigated the influence of twelve media channels (traditional media, new media and social media) on the perceived risk posed by radiation released from the damaged Fukushima nuclear power plant, on respondents' own health and that of the population in general. The analysis controlled for attitude towards nuclear energy, gender, education, satisfaction with the media coverage and duration of attention paid to the coverage. The study uses empirical data from computer-assisted personal interviews (N>1000). The data are representative for the Belgian population with respect to six socio-demographic variables: gender, age, language, education, region and level of urbanisation. Results show that some media channels do influence risk perception. Television, interpersonal communication and the category of miscellaneous online sources are significant predictors of the perceived health-related risk of the nuclear accident. More favorable attitudes towards nuclear power, longer attention to the coverage, and higher satisfaction with the provided information predict lower risk perception. Interpersonal communication is significantly related to satisfaction with the coverage: those unsatisfied with the information were more likely to engage in interpersonal communication. Combined with the significant predictive power of satisfaction with the media coverage, it is evident that the media indeed play a role in shaping the risk perception of a nuclear accident. Future research could look into the quantitative and qualitative differences in content between different media channels and an additional longitudinal study would provide more definitive clues on causality.

PP 1.8. Effectiveness of Nuclear Preparedness Communicators: Nuclear Industry, Authorities, Scientists

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Abstract

An experiment with a TV clip shows that nuclear preparedness communication could be equally successful communicated by low or high credible communicators. A big scale survey experiment was conducted using a representative Belgian sample (N= 1031). All participants watched a TV clip in which nuclear emergency mitigation actions are communicated (e.g. do not use telephone in case of an emergency or leave your kids at school). In one condition all communicators in the TV clip were labeled as nuclear industry, in a second as authorities and in a third as scientists. Immediately after exposures to a TV clip the influence of communicator credibility on information reception (attentiveness, remembering and recall of communicated mitigation actions) and on information acceptance (level of agreement with communicated mitigation actions) was measured. The results show that- although not considered equally credible - all communicators were equally effective in communicating mitigation actions. No significant differences were observed in reception or acceptance of mitigation actions among respondents observing and listening communicators from nuclear industry, authority or scientist. On the other hand a statistically significant difference was observed with a control group of respondents. The respondents being exposed to communication were more knowledgeable about the nuclear mitigation actions and they accepted these actions to a greater extent than respondents not being exposed to communication. This experiment shows that preparedness communication for nuclear and radiological accidents should be intensively communicated by all involved nuclear emergency actors regardless to their level of credibility.

PP 1.9. Influence of Public Opinion, Political Elites and Mass Media on Nuclear Energy Policy: From Literature Review to Conceptual Framework

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Abstract

Countries reacted differently to the Fukushima accident. Germany decided to exit nuclear energy production, while the United Kingdom maintained its decision to increase the production of nuclear energy (Wittneben, 2012). How can we explain these different policy reactions? Which factors determine policy change and stability after Fukushima? These questions are tackled theoretically, by conducting a literature review. In this review we look at the role of public opinion, political elites and mass media in nuclear energy policy, both in general and with a particular focus on the period after the Fukushima nuclear accident. First an overview of all relevant journals is made. This list contains journals from different research domains, giving us a broad understanding of nuclear energy policy. The fields included are: i) science and technology studies (e.g. Risks, Hazards and Crisis in Public Policy); ii) risk research (e.g. Risk Analysis); iii) policy studies (e.g. Energy Policy) and iv) political science (e.g. West European Politics). In the second step the articles for the literature review were identified and selected. Third, a systematic overview of the findings, methods and theories is made. The results show that authors have tried to understand nuclear energy policy change and stability using a diverse set of theoretical and methodological approaches. Multiple studies indicate that the Punctuated Equilibrium Theory of Baumgartner and Jones (1993) and the Advocacy Coalition Theory of Sabatier (1988) are useful frameworks for studying nuclear energy policy. The following limitations in the existing literature are identified; first, the studies are dominantly descriptive. Finally, research on nuclear energy policy often focuses on just one or two variables for instance public opinion or mass media. Based on this review I conclude that i) there is a need for further empirical analysis and the integration of different variables in a general framework of nuclear energy policy, and ii) that nuclear energy policy can only be fully understood when studied as a political phenomenon. The conceptual framework will guide my future empirical research.

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Notes


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