

NERIS Platform

Strategic Research Agenda (Version 1.0 + update from September 2013)

Wolfgang Raskob on behalf of the MB of NERIS

Wolfgang.raskob@kit.edu

- Introduction into NERIS Platform
- The Strategic Research Agenda (SRA)
 - Key topics of interest
 - Link to on-going research projects
- September meeting of the RTD Committee

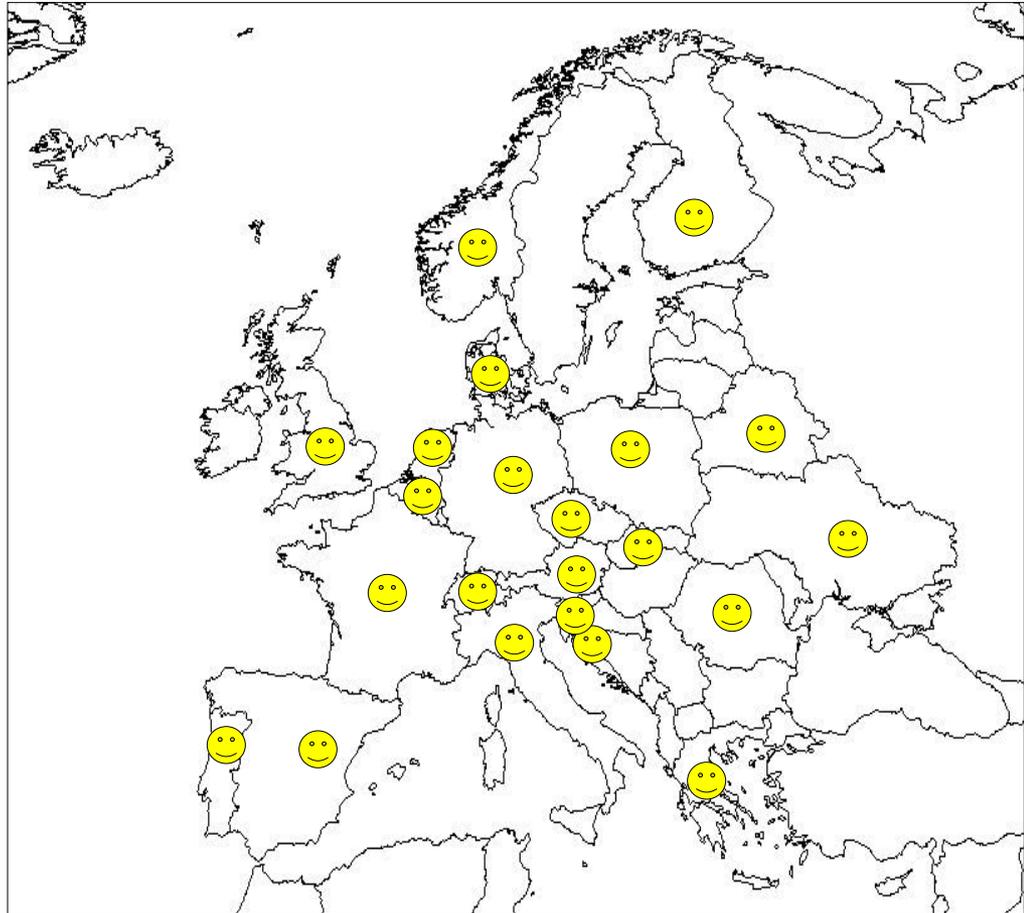
Why NERIS ?

- Real need and desire to maintain the collaboration momentum gained during the EURANOS project in 2004-2009
- Tendency of the EC to aggregate R&D activities in Europe under larger platforms (Technology Platforms)
- Mission orientation of the platforms:
 - “European *need, challenge or problem, rather than simply seek to implement a technology.* That is to say, the focus must be on the overall innovation challenge, including its social- economic- legislative- political- implementational aspects, rather than only the technological issues” (EURAB 04.010, European Research Advice Board)

- Emergency management includes all these aspects (social, economical, legislative, political and implementational, and also technological)
- Europe: an array of countries with various cultural backgrounds and differences in administrative culture and legislation
- Europe needs more coherent response to nuclear emergencies and continuously updated to reflect the changing challenges to society
- Examples: Fukushima, I-131 release in Budapest, (Chernobyl)

- by 2015, the self-sustaining association for development of the joint European approach in responding to and recovering from nuclear and radiological emergencies exists, and
- by 2020, all European organisations being members of NERIS are sharing common views and common approaches and developing and using compatible technology and methods for consequence management of the emergencies

- To date (10/2013), **49 organisations** from **23 countries** have joined the Platform which comprises national and local authorities, technical support organisations, professional organisations, research institutes, universities and non-governmental organisations.

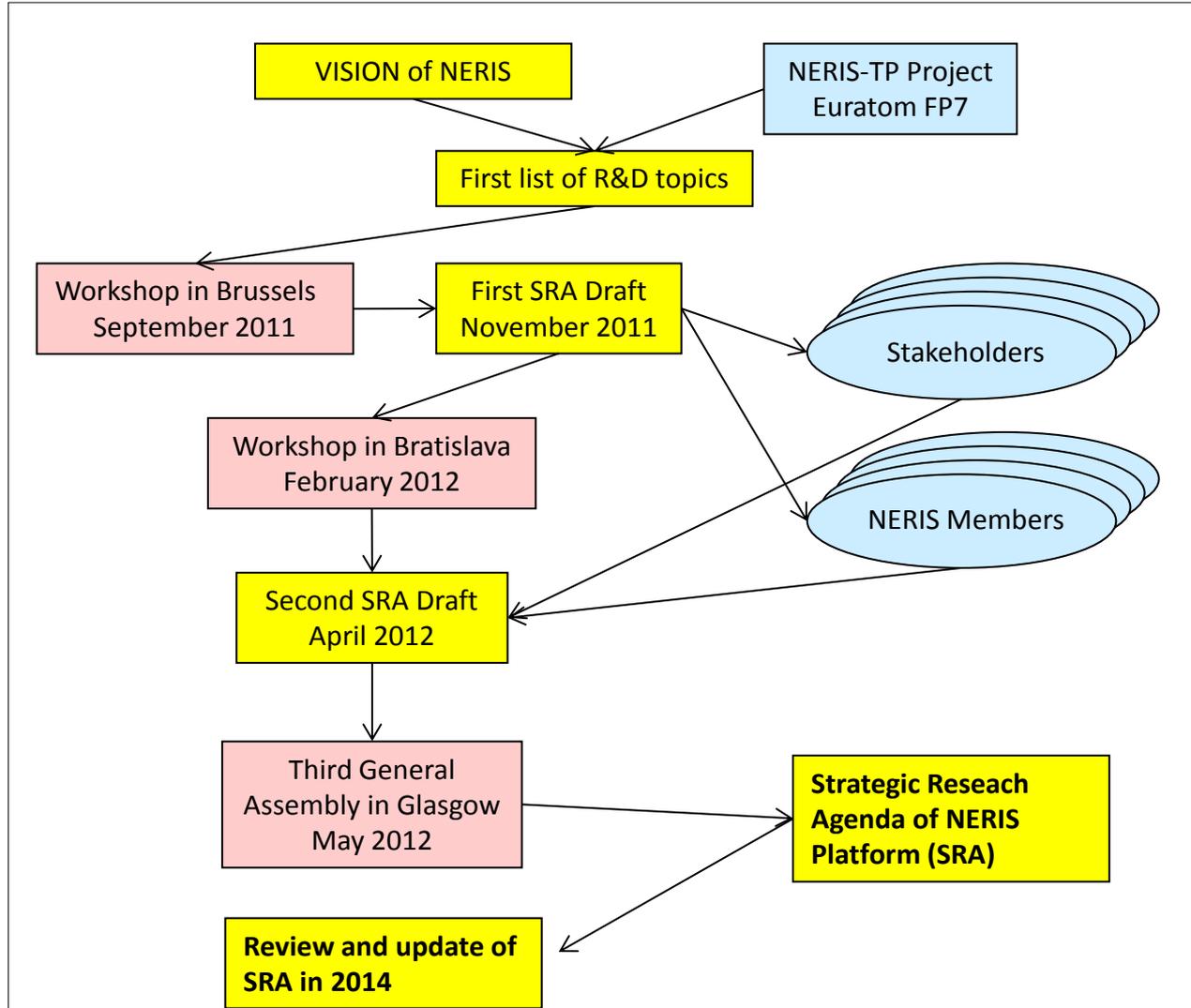


30 Members of the NERIS Platform :

- [AgroParisTech](#) - Paris Institute of Technology for Life, Food and Environmental Sciences (France)
- [AIT](#) - Austrian Institute of Technology (Austria)
- [ANCCLI](#) - National Association of Liaison Committee (France)
- [APA](#) - Agencia Portuguesa do Ambiente (Portugal)
- [ASN](#) - French Safety Authority (France)
- [CIEMAT](#) - Research Centre for Energy, Environment and Technology (Spain)
- [DEMA](#) - Danish Emergency Management Agency (Denmark)
- [DZZZ](#) - Office for Radiological and Nuclear Safety (Croatia)
- [EVIRA](#) - Finnish Food Safety Authority (Finland)
- [GRS](#) - Gesellschaft für Anlagen und Reaktorsicherheit (Germany)
- [IAE POLATOM](#) - Institute of Atomic Energy (Poland)
- [IFIN HH](#) - National Institute of Physics and Nuclear Engineering (Romania)
- [ISS](#) - Istituto Superiore di Sanità (Italy)
- [ITN](#) - Instituto Tecnológico e Nuclear (Portugal)
- [MBS](#) - University of Manchester (United Kingdom)
- [NAEA](#) - National Atomic Energy Agency (Poland)
- [NRG](#) - Nuclear Research and Consultancy Group (Netherlands)
- [PHE](#) - Public Health England (United Kingdom)
- [PMA](#) - Pays de Montbéliard Agglomération (France)
- [RIKILT](#) - Institute of Food Safety (Netherlands)
- [RIR](#) - Research Institute of Radiology (Belarus)
- [RIVM](#) - National Institute for Public Health and the Environment (Netherlands)
- [RPII](#) - Radiological Protection Institute of Ireland (Ireland)
- [SCN](#) - Institute for Nuclear Research (Romania)
- [SNSA](#) - Slovenian Nuclear Safety Administration (Slovenia)
- TRPA - Taiwan Radiation Protection Association (Taiwan)
- [UCEWP](#) - Ukrainian Center of Environmental and Water Projects (Ukraine)
- [UOI](#) - University of Ioannina (Greece)
- [University of Warwick](#) (United Kingdom)
- [UVM.BWL](#) - Ministerium für Umwelt, Naturschutz und Verkehr Baden-Württemberg (Germany)

19 Supporting organisations:

- [BfS](#) - Federal Office for Radiation Protection (Germany)
- [CEPN](#) - Nuclear Evaluation Protection Centre (France)
- [DTU](#) - Technical University of Denmark (Denmark)
- [FOPH](#) - Federal Office of Public Health, Radiological Protection (Switzerland)
- [GAEC](#) - Greek Atomic Energy Commission (Greece)
- [IKE](#) - Institute of Nuclear Technology and Energy Systems (Germany)
- [IRSN](#) - French Institute for Radiological Protection and Nuclear Safety (France)
- [KIT](#) - Karlsruhe Institute of Technology (Germany)
- [KWR](#) - Watercycle Research Institute (Netherlands)
- [MUTADIS](#) (France)
- [NRPA](#) - Norwegian Radiation Protection Authority (Norway)
- [PDC](#) - Prolog Development Center (Denmark)
- [SCK.CEN](#) - Belgian Nuclear Research Centre (Belgium)
- [STUK](#) - Finnish Radiation and Nuclear Safety Authority (Finland)
- [SURO](#) - National Radiation Protection Institute (Czech Republic)
- [UMB](#) - Norwegian University of Life Sciences (Norway)
- [UNIMI](#) - University of Milan (Italy)
- [UPM](#) - Universidad Politécnica de Madrid (Spain)
- [VUJE](#) - Nuclear Power Plants Research Institute (Slovakia)



Strategic Research Agenda of NERIS

- **Atmospheric & aquatic modelling – Needs for improvement**
 - Key Topic 1: Atmospheric dispersion modelling
 - Key Topic 2: Aquatic dispersion modelling
- **Better dose assessments and decision support based on improved knowledge: source term, scenarios, etc.**
 - Key Topic 3: Improvement of existing Decision Support Systems
 - Key Topic 4: Data mining, information gathering and exchange including providing information to stakeholders and mass media
 - Key Topic 5: Usage of the existing tools in the best possible way
- **Stakeholder involvement and local preparedness and communication strategies.**
 - Key Topic 6: Stakeholder engagement and dialogue
 - Key Topic 7: Social media/networking technology

Activities: atmospheric dispersion modelling

Development of modelling approaches that allow existing DSSs to handle – intentional or accidental – atmospheric releases of radiological or nuclear material in complex settings (urban or confined spaces); combination of complex (CFD – Computational Fluid Dynamics) with simpler modelling and other appropriate methodologies. **There should also be guidance developed to provide guidelines for users on how to perform urban modelling and how simple approaches compare with more complex models**

security issue?

Consider particle/gaseous infiltration in urban areas especially with releases with durations of several hours or greater.

Development and / or integration of computational tools in existing DSSs for assimilation of atmospheric measurements (e.g., gamma radiation dose rates, concentration) and/or inverse modelling to estimate unknown source term (location, emission rate) in urban areas and in open spaces.

PREPARE

Extension of capability of dispersion models in existing DSSs to treat detailed information for particular types of sources (e.g., explosions, two-phase, aerosol sprays, fires, general short-term releases), and to simulate dispersion of particular substances (aerosol, phase-changing, particles with spectrum of different sizes, chemical transformations).

Partly PREPARE

Extension of capability of dispersion models in DSSs to treat phenomena that currently are not considered, such as deposition due to snow. **A general review of deposition modelling techniques would be helpful.**

no

Activities: atmospheric dispersion modelling

Assessment of models uncertainties. **E.g., quality of NWP data versus measured data for dispersion calculations. Methods for validating NWP data for specific sites.**

no

Use and guidance on new meteorological instruments for local dispersion calc., optimal use and optimization

Research on short-duration (e.g. explosions) releases: assessment of doses, estimation of source-term.

security issue?

Extension of existing DSSs to simulate very long-duration releases (e.g. one month to one year) both to air and to sea by automatic update of meteorological data, restart of dispersion models and user update of source term information.

no

- September 2013, the RTD Committee met in Brussels to review the current SRA and discuss research priorities
 - The NERIS Platform is special as it comprises research and operational community in nearly equal numbers
 - How to balance between applied research and implementation?
 - Are operational tasks of interest for EC funded research?
 - How to separate radiation protection from security research?
 - How to integrate social sciences better into the technical research projects?
 - Relation to other organisations such as HERCA, WENRA, Platforms etc.
 - What can we learn from Fukushima?
 - Need to clarify which topics in our SRA are part of on-going research projects such as NERIS-TP and PREPARE
 - So far monitoring was not a high priority
 - Validating of codes/tools and uncertainty handling should be come priorities

- The SRA 1.0 contains 38 individual research activities out of seven Key Topics and three Research Areas
- One Research Area was added (4): **Improving the Decision making processes**
- Priorities
 - Extend the capabilities of the atmospheric dispersion models by considering the “wet” deposition by snow; to be started by a review of the current approaches and if necessary
 - Development of models for the urban areas focusing on waste water from decontamination actions and contamination of water in urban areas in general
 - Develop local radioecological models and integrate them into a general Decision Support Systems (DSS) to interlink with monitoring information and the more global foodchain and dose models
 - Applicable at farm level, simple to use, but integrated in the overall picture

- Priorities cont.
 - Investigate model uncertainties and how this can be communicated in the model results and in the DSS to help decisions maker in understanding the usefulness of a map result
 - This may have many subtopics which require further prioritisation
 - Improving the decision making processes and their interactions in an emergency event and the recovery
 - Decision making for all involved stakeholders taking into account the complexity and the large uncertainty of the situation
 - Robust decision making
 - Develop the best possible way how to use the results of a DSS
 - Usage of formal decision aiding tools for the various concerned stakeholders (e.g. Multi Criteria Decision Analysis)
 - This may have many subtopics which require further prioritisation
 - Monitoring strategies – how to learn from past events
 - How to integrate results from professionals and lay people into one common operational picture at the various stages of an emergency and recovery situation

- Urban hydrology (Alliance?)
- Local radiological models (Alliance?)
- Monitoring strategies (EURADOS?)

- Open questions
 - We still have to define research links to MELODI
 - How to deal with the holistic approach of a crisis situation
 - The NERIS SRA is still more a shopping list and needs revision in the next SRA
 - Enlarge our community to attract further social scientists?



- **Outcome of the OPERRA project**
 - Whatever is the outcome, NERIS association is needed as platform for emergency management and recovery
- **SRA on emergency management and recovery at the European level is a necessity to secure a joint European approach**
- **R&D Committee of NERIS has to keep SRA updated**

Questions?