

NERIS: European Platform on Preparedness for Nuclear and Radiological Emergency Response and Recovery

Strategic Research Agenda

T. Schneider^{1,2}, F. Hardeman^{3,4}, J. Camps⁴, K. Andersson⁵, A. Bexon⁶, J. Bohunova⁷, S. Charroñ⁸, P. Croüail², C. Landman⁹, M. Montero¹⁰, E. Holo¹¹, W. Raskob⁹

¹*Chair of NERIS Platform*

²*CEPN, Fontenay-aux-Roses, France*

³*Chair of NERIS R&D Committee*

⁴*SCK-CEN, Mol, Belgium*

⁵*DTU, Lyngby, Denmark*

⁶*PHE, Chilton, UK*

⁷*VUJE, Trnava, Slovakia*

⁸*IRSN, Fontenay-aux-Roses, France*

⁹*KIT, Karlsruhe, Germany*

¹⁰*CIEMAT, Madrid, Spain*

¹¹*NRPA, Oslo, Norway*

Introduction

Created in 2010, the aim of the NERIS Platform is to establish a forum for dialogue and methodological development between all organisations and associations taking part in decision making of protective actions in nuclear and radiological emergencies and recovery in Europe. The objectives of the Platform are to contribute to improving the effectiveness of current approaches for preparedness, promoting more coherent approaches, identifying gaps and needs for further developments, addressing new and emerging challenges and maintaining and improving know-how and technical expertise in this field.

The NERIS Platform has been registered on the 28th of August 2012 as a legal European Association under the French Law to reinforce its structure and to ensure its sustainability. Currently, 54 organisations from 24 different countries are members of the NERIS Platform, with 26 organisations (called "NERIS supporting organisations") being legally members of the NERIS Association and supporting it financially.

The NERIS R&D Committee (composed of 12 members) elaborates the strategic orientation of the Platform based on the new areas of interest identified by the Working Groups and the expectations and demands of the NERIS partners. This paper presents the current version of the NERIS Strategic Research Agenda, as updated on April 2014.

1. KEY TOPICS OF THE NERIS STRATEGIC RESEARCH AGENDA

The Strategic Research Agenda (SRA) has been structured in three main research areas covering new challenges in atmospheric & aquatic modelling, new challenges for better dose assessments and decision support based on improved knowledge and new challenges in stakeholder involvement and local preparedness and communication strategies.

1.1. Area 1: New challenges in atmospheric & aquatic modelling – Needs for improvement.

Area 1 deals with dispersion of radioactive materials (in solid or gaseous form) in the atmosphere or in water systems. Most of the challenges in atmospheric dispersion are related, on one hand, to dispersion in urban and confined environments, and on the other hand to very short- or very long-duration releases (explosions and Fukushima type releases). New programming techniques and more efficient algorithms enable today modelling of different

urban environments and very short-duration releases. Development of rapid data assimilation techniques and inverse modelling are associated with all kind of dispersion modelling and should be further improved to obtain better situation awareness in the very early phase of an emergency. The same applies to source term estimation.

The Fukushima accident proved the importance of dispersion of radionuclides in coastal environment, pointed out a real need to develop site-specific models. Furthermore, any coastal dispersion model should be linked with an ocean model as driving force. Contamination of drinking water with radionuclides in intentional or accidental releases is also an area which requires further research. In general, the linkage between transport and dispersion modelling and dose assessment models has to be intensified and interfaces harmonised.

1.2. Area 2: New challenges for better dose assessments and decision support based on improved knowledge: source term, scenarios, etc.

Area 2 deals with Decision Support Systems (DSS) and the decision-making processes in case of nuclear or radiological emergencies including the longer term rehabilitation issues. On one hand, the DSS include several simulation models such as dispersion and dose assessment models, and in this respect they are closely related to topics in Area 1. Source term estimations are of primary importance, particularly the knowledge of the composition to develop appropriate countermeasure strategies. In this respect, estimation of the source term based on in plant data, dose rate monitoring and in general applying optimised monitoring strategies is of high priority. Developing computational models to simulate the recommendations for the countermeasures on the operational/tactical level can better link the crisis centre to the commander in chief locally (Command and Control (C2) systems).

The Fukushima accident demonstrated the need for a European platform where data and information of governmental and non-governmental organizations can be collected on one hand and on the other hand made available to all interested parties. This kind of access/exchange platform might be an important tool in order to achieve more coherent decisions. On the other hand, the analyses of the management of the consequences of the Fukushima accident point out the importance to understand and possibly improve/foster the decision-making processes at the local, regional and national levels. Various issues have been identified to better structure the decision processes and to provide further guidance for their implementation. This comprises providing accurate information, favouring efficient use of existing DSS and tools and allowing a better allocation of resources for reaching efficient protective strategies responding to the expectations of the various stakeholders in emergency and recovery phases.

1.3. Area 3: New challenges in stakeholder involvement, local preparedness and communication strategies.

Area 3 deals with stakeholder involvement, local preparedness and communication strategies in an emergency and recovery situation. In this area, communication and information issues are of great importance due to requirements for huge amount of information and measurements, use of modern social media through Internet, and possible contradictory information being available. The Fukushima accident demonstrated on one hand that new European stakeholders were engaged in decision making to protect European citizens in Japan. Foreign governments advised different protective actions to their citizens, which created confusion within the public. Iodine tablets were sold out in Europe without proper justification; some countries introduced restrictions on food import, many embassies relocated from Tokyo, etc. On the other hand, the follow-up of the management of the consequences of the Fukushima accident in Japan leads to revisit the existing framework for public participation notably in the perspective of the Aarhus Convention and ways for improving the implementation of protection strategies. In this context, the objective in this area is to further improve the strategies for ensuring appropriate stakeholder engagement, information exchange and dialogue between different actors (stakeholders, public, authorities) in emergency and recovery response and preparedness,

2. Perspectives

For the future, one of the key challenges is the organisation of the common road map on radiation research in Europe with the other research Platforms (MELODI, ALLIANCE and EURADOS) in the perspective of European research programme Horizon 2020. This road map will have to be elaborated taking into account the first lessons drawn from the management of the consequences of the Fukushima accident, as well as the evolution of international and national organisations' emergency and recovery strategies. In this perspective, the work performed in the NERIS Platform will have to be deepened and shared with all interested stakeholders.

References

NERIS: Strategic Research Agenda of the NERIS Platform. Version 2 (Draft04), April 8, 2014

NERIS Web site: www.eu-neris.net

NERIS TP final report. NERIS-TP(WP6)-(14)-03