

# PREPARE

## **PREPARE: INNOVATIVE INTEGRATED TOOLS AND PLATFORMS FOR RADIOLOGICAL EMERGENCY PREPAREDNESS AND POST-ACCIDENT RESPONSE IN EUROPE**

**Research project under the European Commission's 7th Framework Programme, EURATOM for Nuclear Research and Training Activities (work programme 2012), Fission-2012-3.3.1, Grand Agreement Number 323287**

### **1. Nature and scope of the project**

This project 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 operational 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 45 partners) will be actively involved in the development of the new tools.

### **2. Activities**

This project intends to carry out activities to meet the research challenges defined above. This comprises the evaluation of operational procedures, food safety criteria, atmospheric dispersion and deposition, aquatic modelling, source term estimation, communication with the public and information collection and the scientific evaluation of an on-going nuclear or radiological disaster. The tools developed within the project will be partly integrated into the two decision support systems ARGOS and RODOS. Further methods and tools will be made available for scientific or operational institutions to complement decision support systems. The Analytic Platform may have the potential to become a European centre for collecting and evaluating information and therefore has to be self-sustaining. It is important to note, that improvements can only be made by fostering the interaction between science and operational centres and also by improving communication to the public. This can be achieved in following-up the successful activities started in the European project NERIS-TP and with the NERIS Platform (NERIS – European Platform on Preparedness for Nuclear and Radiological Emergency Response and Recovery), which comprise the key players in Europe. As the engagement with potential end users is also a key for success, the NERIS Platform members and the members of the ARGOS and RODOS user groups will be integrated in this project as associated partners. The chair of the NERIS platform will become a member of the proposed Management Committee. With the ARGOS and RODOS users groups running under the umbrella of the proposed platform, all European Member States, Associated States and even countries outside Europe are part of the dissemination and communication network of the project.

### **3. CONSORTIUM**

- Karlsruhe Institute of Technology, Germany (Coordinator)
- Centre d'étude sur l'Évaluation de la Protection dans le domaine Nucléaire, France
- Norwegian Radiation Protection Authority, Norway
- VUJE Inc., Slovak Republic
- Radiation and Nuclear Safety Authority of Finland, Finland
- Universidad Politécnica de Madrid, Spain
- MUTADIS, France
- National Centre for Scientific Research "Demokritos", Greece
- Technical University of Denmark, Denmark

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- Danish Emergency Management Agency, Denmark
- Prolog Development Centre, Denmark
- Health Protection Agency, United Kingdom
- Norwegian University of Life Sciences, Norway
- Ukrainian Center of Environmental and Water Projects, Ukraine
- Bundesamt für Strahlenschutz, Germany
- Slovenian Nuclear Safety Administration, Slovenia
- Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, Spain
- Belgian Nuclear Research Centre, Belgium
- Institute de Radioprotection et de Sureté Nucléaire, France
- Association of Instituto Superior Técnico for Research and Development, Portugal
- Jožef Stefan Institute, Slovenia
- Greek Atomic Energy Commission, Greece
- Agencia Portuguesa do Ambiente, Portugal
- National Institute for Public Health and the Environment, The Netherlands
- Radiological Protection Institute of Ireland, Ireland
- University of Natural Resources and Life Sciences Vienna, Austria
- University of Western Macedonia, Greece
- University of Milan, Italy
- Nuclear Research & consultancy Group, The Netherlands
- Liana Papush, Sweden
- EnerWebWatch/Coopaname, France
- Association pour le Contrôle de la Radioactivité dans l'Ouest, France
- University of Ljubljana, Slovenia
- "Horia Hulubei" National Institute of R&D for Physics and Nuclear Engineering, Romania
- University of Seville, Spain
- Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile, Italy
- Nuclear Safety Authority (ASN), France
- RIKILT – Institute of Food Safety, Wageningen University and Research, The Netherlands
- Royal Netherlands Meteorological Institute, The Netherlands
- KWR Water B.V., The Netherlands
- Federal Agency for Nuclear Control, Belgium
- Office for Nuclear Regulation, United Kingdom
- TN International, France
- State Scientific and Technical Centre for Nuclear and Radiation Safety, Ukraine
- Eidgenössisches Departement des Inneren (EDI), Switzerland

## 4. RESEARCH ACTIVITIES (RTD)

Following the Fukushima accident needs for research have been identified on a European level. This comprises operational aspects of emergency management procedures, methods and tools as well as purely scientific investigations that may become operational beyond the framework of the three year project.

The following tasks have been identified and will be performed in six research work packages:

- **Operational procedures for long lasting releases:** Following the Fukushima Daiichi accident a review of existing procedures for long lasting releases and identification of possible needs for improvements by performing scenario calculations will be performed on a European level. (WP1)

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- **Platform for information collection and exchange:** The objective of this activity is to develop scientific methods and tools that could be used by a European Platform (i.e. focal point) for the collection of and analysis of information from any nuclear or radiological event, particularly regarding the consequences and any further developments. The intention is to set up such a Platform on a scientific level and discuss within the three years of the project whether such a platform should be formalised either as part of the NERIS Platform or as a tool of the European Commission. (WP2)
- **Contaminated goods:** Following the Fukushima accident it became obvious, that the recommendations or requirements to deal with contaminated goods already existing worldwide (IAEA, Codex Alimentarius) and in Europe (Euratom regulations) were apparently too simple (based only on criteria in activity concentration) and not so easy to implement. Improvements should be proposed at least on a European level (WP3)
- **Improvement to terrestrial aspects of decision support systems:** Fukushima clearly demonstrated the importance of a source term estimation that is not only based on information from the plant operators. Lessons from Chernobyl showed deficits in the representation of the physico-chemical properties of radionuclides emitted in the atmospheric dispersion models of ARGOS and RODOS (WP4)
- **Improvement to aquatic aspects of decision support systems:** The aquatic models in decision support systems are far less developed than those for terrestrial ecosystems. This was apparent for the Fukushima accident as during the first month, there was no simulation of the activity released into the ocean. In this respect we intend to integrate state of the art aquatic models into the RODOS DSS and couple them with countermeasure simulation models. Further to this the new capabilities will be tested for several important European aquatic systems. (WP5)
- **Communication with the public:** The overall objective of the work package is to 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. Information needs in this context refer to the understanding (by the members of the public) of the evolution of the accident, its management (and the related potential risks) and the capacity of the population and communities to prevent or mitigate individually and collectively harm arising from the threat. (WP6)

## 5. TRAINING AND DISSEMINATION

The main objectives here are the further dissemination of the products that will be developed in the other work package. This includes tests by and training of end users of these products. Particular activities include:

Basic training of key players in the field of nuclear and radiological emergency and post-accident management by the organization of two basic courses:

- Training Course on Preparedness and Response for Nuclear and Radiological Emergencies;
- Training Course on Late Phase Nuclear Accident Preparedness and Management.

Dissemination of knowledge acquired in this project. This includes training related to the use of specific tools developed or updated in this project, as well as main theoretical and practical insights gained within the project.

Development and organisation of comprehensive nuclear/radiological emergency exercises. Two exercises will be organised:

- Emergency exercise to evaluate the response during an accident involving an international transport of radioactive material;
- Table-top exercise to evaluate the preparedness for monitoring the extent of a large scale cross-border radioactive contamination in the aftermath of a nuclear accident.

Final dissemination workshop to demonstrate the new methods and tools to all potential end users.