

IFIN-HH proposals related to *FP7-Fission-2011*

(www.nipne.ro/community/announcements/euratom2011/Proposal_IFINHH_2_FP7-Fission-2011.pdf)

1. **Performance assessment support studies for geological disposal systems of radioactive wastes and spent fuel**, Alexandru Pavelescu (apavelescu@ifin.nipne.ro), DDR/IFIN-HH, *Fission-2011-1.1.1*
2. **Emission of prompt neutrons and gamma-rays during low-energy nuclear fission: advanced modeling**, Dr. Nicolae Carjan (carjan@theory.nipne.ro), DFT/IFIN-HH, *Fission-2011-2.3.1*
3. **Cross sections and fragment distributions in neutron-induced fission relevant to Th cycle**, Dr. Mihail Mirea (mirea@nipne.ro), DFT/IFIN-HH, *Fission-2011-2.3.1*
4. **Nuclear structure measurements of importance for the decay heat calculation for the Th/U fuel**, Dr. Nicolae Marginean (nmarg@nipne.ro), DFN/IFIN-HH, *Fission-2011-2.3.1*
5. **Characterization of low-activation materials (LAM) based on nuclear model analysis**, Assoc. Prof. Vlad Avrigeanu (vavrig@nipne.ro), DFN/IFIN-HH, *Fission-2011-2.3.1*
6. **Development of a robust model for risk of exposure after an accidental emission of tritium**, Dr. Dan Galeriu (galdan@ifin.nipne.ro), DFVM/IFIN-HH, *Fission-2011-2.3.1*
7. **Characterization of liquid wastes containing beta emitters using a compact LSC-TDCR**, Assoc. Prof. Maria Sahagia (msahagia@nipne.ro), DRMR/IFIN-HH, *Fission-2011-2.3.1*
8. **Nuclear decay data evaluations for the fission products of Th/U fuel cycle**, Dr. Aurelian Luca (aluca@nipne.ro), DRMR/IFIN-HH, *Fission-2011-2.3.1*
9. **Endurance tests of materials in presence of high tritium activities**, Dr. Cristian Postolache (cristi@nipne.ro), DRMR/IFIN-HH, *Fission-2011-2.3.1*
10. **Incinerator for low and medium activities tritium wastes, resulted from CANDU NPP**, Dr. Cristian Postolache (cristi@nipne.ro), DRMR/IFIN-HH, *Fission-2011-2.3.1*
11. **Positron Annihilation Spectroscopy in material studies**, Dr. Florin Constantin (fconst@ifin.nipne.ro), DFNA/IFIN-HH, *Fission-2011-2.3.1*
12. **Hypersensitive study by AMS of Tritium and Deuterium trapping materials used at Detritiation facilities of Heavy Water**, Dr. Mihaela Enachescu (menache@nipne.ro), DFNA/IFIN-HH, *Fission-2011-2.3.1*
13. **Non-targeted effects induced by low dose rate irradiation in endothelial cells**, Dr. Diana Savu (dsavu@nipne.ro), Dr. Mihai Radu (mradu@nipne.ro), DFVM/IFIN-HH, *Fission-2011-3.1.1*
14. **The assessment of the radiological impact on the environment during the nuclear reactor decommissioning; set up of a database concerning the radioactivity levels in IFIN-HH area as well as in the surrounding areas**, Dr. Ana Stochioiu (stoc@nipne.ro), DFVM/IFIN-HH, *Fission-2011-3.1.1*
15. **Epidemiological studies on non cancer effect of radiation**, Dr. Cristian Postolache (cristi@nipne.ro), DRMR/IFIN-HH, *Fission-2011-3.1.1*
16. **Three-dimensional Tomograph for Positron Emission Tomography (PET)**, Dr. Florin Constantin (fconst@ifin.nipne.ro), DFNA/IFIN-HH, *Fission-2011-3.1.1*
17. **Interdisciplinary Accelerator Mass Spectrometry Applications**, Dr. Catalin Stan Sion (stansion@nipne.ro), DFNA/IFIN-HH, *Fission-2011-3.1.1*
18. **Open access at U-120 Cyclotron facility for Ion Beam Applications**, Dr. Dorin Dudu (ddudu@nipne.ro), DFNA/IFIN-HH, *Fission-2011-4.2.1*
19. **Applied Workshop on Decommissioning of a VVR-S Type Research Reactor**, Dr. Mitica Dragusin (dragusin@nipne.ro), DDR/IFIN-HH, *Fission-2011-5.1.1*
20. **Networking dismantling and decontamination technologies for VVR-type research reactors decommissioning**, Dr. Mitica Dragusin (dragusin@nipne.ro), DDR/IFIN-HH, *Fission-2011-6.0.2*
21. **Customization of RODOS (Real-time On line Decision Support System) expert system to support decision makers in a case of accidental release at CANDU NPP-Cernavoda, Romania**, Dr. Dorina Gheorghiu (dorina@nipne.ro) Dr. Stelian Dan Slavnicu (dansla@nipne.ro), DFVM/IFIN-HH, *Fission-2011-6.0.2*
22. **Nuclear-Analytical-Mat"- the first Analytical Euro-Network focused on a complex characterisation of (nuclear) materials including micro-nano-structures**, Dr. Emanuela Cincu (cincue@nipne.ro), DFNA/IFIN-HH, *Fission-2011-6.0.2*

WORK PROGRAMME 2011

EURATOM for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August 2010
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- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: Management of Radioactive Waste: Fission-1

Area: Geological disposal

Topic: Fission-2011-1.1.1: Research activities in support of implementation of geological disposal

In line with the requirements of the SET-Plan, the Strategic Research Agenda (SRA) of Implementing Geological Disposal – Transfer Platform (IGD-TP) (www.igdtp.eu), support will be provided for activities addressing topics on the critical path for the implementation of geological disposal in Europe. The most advanced national programmes are not the only to be targeted, and proposals are equally welcome that address the needs of less advanced programmes in view of developing their knowledge base in preparation for implementation.

Proposals will not be welcome in areas already considered adequately covered by past or on-going research. It is viewed that the active participation of relevant partners from third countries should add to the scientific and/or technological excellence of some projects and/or lead to an increased impact of the research to be undertaken.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro>)

Proposal: Performance assessment support studies for geological disposal systems of radioactive wastes and spent fuel (Comments on the IGD-TP SRA Key Topics)

Contact Person: Dr. Alexandru Pavelescu (apavelescu@ifin.nipne.ro)

Abstract. Regarding the IGD-TP SRA Deployment Plan (DP), IFIN-HH contribution may consist mostly of modelling studies with emphasis on CANDU spent fuel disposed in crystalline and salt rock. The reason for Romania interest in these Topics and the proposed contributions is due to the fact that in the vicinity of the NPP “Cernavoda” (which uses CANDU fuel) there is a potential geological disposal location for spent fuel inside green schist, which is a crystalline rock. This location, as well as “Varful Pietrii” granite massif in Carpathians Mountains and some other salt locations in Transylvania Depression, are comprised in the Romanian national strategy regarding final disposal of spent fuel as candidate sites.

Given its specialists expertise in the following fields, IFIN-HH could participate in Key Topic 3, Topics 9, 10 & 14, as follows:

- Topic 9: Improved understanding of the impact of hydrogeochemical evolution on the long term performance of bentonite buffer in specific disposal concepts developed for crystalline host rocks. This includes laboratory and modelling studies to improved understanding the impacts on the bentonite buffer long-term safety functions;
- Topic 10: Description of seals and plugs systems and modelling of their long-term behaviour, with assessment of the consequences on long-term safety;
- Topic 14: Laboratory and modelling work on salt backfill should also be performed to study its long-term behaviour (consolidation, healing, and interaction with the surrounding rock, influence of fluids, permeability and porosity).

References

1. A. O. Pavelescu, D.G. Cefruga, R. Tinti, K.Voukelatou. *Estimation of clearance potential index and hazard factors of CANDU fuel bundle and its validation based on the measurements of radioisotopes inventories from Pickering reactor fuel*, [International Conference on Environmental Remediation and Radioactive Waste Management, ICEM 2007, Bruges, Belgium September 2-6, \(2007\)](#);
2. A.O. Pavelescu, D.G. Cefruga, *CANDU radiotoxicity inventories estimation: a calculated experiment cross-check for data verification and validation*, [Romanian Journal of Physics, Publishing House of The Romanian Academy, Volume 52, No. 1-2, \(2007\)](#);
3. A. Pavelescu, *Analysis of the Final Disposal Systems of the Radioactive Wastes in Granite Rock*, [Publishing House of the Academy of Romanian Scientists, \(2009\)](#).
4. M. Dulama, M. Pavelescu, N. Deneanu, C. N. Dulama „*Application of Indigenous Inorganic Sorbents in Combination with Membrane Technology for Treatment of Radioactive Liquid Waste from Decontamination Processes*”, [Radiochimica Acta, Vol. 98, No. 7, pp. 413-420, \(2010\)](#)

IFIN-HH FP7 RCNs: 49105, 84341, 83614 (http://cordis.europa.eu/fp7/partners_en.html)

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Activity: **Reactor Systems: Fission-2**

Area: *Cross-cutting aspects for nuclear systems*

Topic: *Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP*

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP (www.snetp.eu). All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan).

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Emission of prompt neutrons and gamma-rays during low-energy nuclear fission: advanced modeling*

Contact Person: Dr. Nicolae Carjan (carjan@theory.nipne.ro)

Abstract. A new microscopic dynamical modeling of the fast transition that a fissioning nucleus undergoes at scission [1,2] has shown potential in predicting the excitation energy of each primary fission fragment as function of its mass. This quantity is an essential ingredient in the simulation of neutrons and gamma-rays emitted from fully accelerated fragments. Since this quantity is not available from other sources, arbitrary hypotheses have been employed in the past. At the same time the model can estimate the number of scission neutrons (i.e., those emitted at the beginning of the acceleration phase) as function of mass asymmetry. What we so far called 'prompt neutrons' have two distinct components (well separated in time) with different characteristics that have to be treated in chronological order. The emission of neutrons during fission is therefore related to the last stage of the fission process (i.e., the neck rupture) and contains information about the structure and the configuration of the fissioning nucleus at scission.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=492>)

1. N. Carjan, P. Talou, and O. Serot, Nucl. Phys. **A792** (2007) 102-121.
2. N. Carjan and M. Rizea, Phys. Rev. C **82** (2010) 014617.
3. R. A. Gherghescu and N. Carjan, *Two and three fragment decay from Z=120 isotopes*, J. Phys. G: Nucl. Part. Phys. **36** (2009) 025106.
4. N. Carjan and M. Rizea, *Dependence of scission-neutron multiplicities and primary fragments excitation energies on mass asymmetry in low energy fission*, Nucl. Phys. A **805** (2008) 437-439.

IFIN-HH FP7 RCNs: 84270, 83614 (http://cordis.europa.eu/fp7/partners_en.html)

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Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Cross sections and fragment distributions in neutron-induced fission relevant to Th cycle*

Contact Person: Dr. Mihail Mirea (mirea@nipne.ro)

Abstract. An improved accuracy in the evaluation of nuclear fission data with predictive power can be obtained by improving the actual macroscopic-microscopic models by taking into account dynamical effects. Quantities of interest in modeling the fission cross section and the fragments distributions can be obtained by investigating the dynamical evolution of the nuclear system from the compound state up to scission. Such treatments recently developed succeeded to explain the fine structure in the 0.7 MeV resonance of the ^{231}Th fission and the rich threshold resonant structure for ^{233}Th . These phenomena were known as the Th anomaly and were related to the possible existence of a third potential well at hyperdeformation. Our new approach took into consideration the rearrangements of nuclear orbitals along the fission path and deserved a better understanding better of the resonant structure of the neutron induced fission cross section, the odd-even effect in the fission fragment distributions and the dissipated energy. In this context, theoretical evaluation for quantities of interest can be obtained for the fission of actinides.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=376>)

1. M. Mirea, *New Dynamical Pair Breaking Effect*, Physics Letters B **680**, 316-320 (2009).
2. M. Mirea, L. Tassan-Got, C. Stephan, C.O. Bacri and R.C. Bobulescu, *Fine Structure of the 0.7 MeV Resonance in the ^{230}Th Neutron-Induced Fission Cross Section*, Europhys. Lett. **73**(2006)705.
3. M. Mirea, L. Tassan-Got, C. Stephan, C.O. Bacri and R.C. Bobulescu, *Landau-Zener Effect in fission*, Phys. Rev. C **76**, 064608 (2007).
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5. M. Mirea and R.C. Bobulescu, *Cranking mass parameters for fission*, J.Phys. G **37** (2010) 055106.

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IFIN-HH (<http://www.nipne.ro>)

Proposal: *Nuclear structure measurements of importance for the decay heat calculation for the Th/U fuel*

Contact Person: Dr. Nicolae Marginean (nmarg@nipne.ro)

Abstract. A recent report issued by IAEA [1] makes an assessment of fission product decay data requirements for Th/U fuel. The report lists a few key nuclei of importance in the calculation of the heat produced during the cooling of the fission products of the Thorium cycle. Among these nuclei some can be produced by nuclear reactions performed at our Tandem facility [2] like ^{98}Nb or ^{102}Tc . These isotopes have a low-spin short-lived ground state and a high-spin long-lived isomer state and the beta decay from each of these states is of importance. The latest nuclear structure compilations [3,4] show that the beta decay from the long-lived isomer state is generally better known and the experimental information was acquired more than 30 years ago. By performing transfer reactions using the ^7Li projectile we will predominantly populate states with small angular momentum. Further, using the existing pulsed beam, timing and coincidence measurements [5] we will be able to disentangle the states populated via the beta decay from each of the two initial states of the father nucleus. A better knowledge of the decay scheme of the nuclei mentioned in the report [1] will improve the quality of the decay heat calculations for the Th/U fuel.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=194>)

- [1] M. Gupta, M.A. Kellet, A.L. Nichols and O. Bersillon, IAEA report INDC(NDS)-0577 (2010).
- [2] D. Bucurescu, Gh. Cata-Danil, N.V. Zamfir, Nucl. Phys. News **17**, No. 1, 5 (2007).
- [3] B. Singh, Z. Hu, Nuclear Data Sheets **98**, 335 (2003).
- [4] D. De Frenne, Nuclear Data Sheets **110**, 1745 (2009).
- [5] C. Mihai et al, Phys. Rev. C **81**, 034314 (2010).

IFIN-HH FP7 RCNs: 84341, 83614 (http://cordis.europa.eu/fp7/partners_en.html)

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Area: *Cross-cutting aspects for nuclear systems*

Topic: *Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP*

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP (www.snetp.eu). All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan).

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Characterization of low-activation materials (LAM) based on nuclear model analysis*

Contact Person: Assoc. Prof. Vlad Avrigeanu (vavrig@nipne.ro,
http://tandem.nipne.ro/~vavrig/CV-VA_en_GB.pdf)

Abstract. The present proposal concerns the analysis of nucleon-, deuteron- and alpha-induced reactions at low and intermediate energies, required by programmes for e.g. low-activation materials (LAM) by means of (a) semi-classical pre equilibrium and Hauser-Feshbach statistical models, (b) quantum-mechanical Feshbach-Kerman-Koonin multistep reaction theory, (c) alpha-particle double folding (DF) microscopical optical potentials, and (d) improved versions of the corresponding computer codes previously contributed to NEA-DB (Paris), RSICC (Oak Ridge), and CPC-PL (Belfast) [IAEA0971/03 (1988), NESC9872/09 (1993), PSR-325 (1996), ADIK (1998)]. Alpha-particle displacement cross sections are of key importance in this respect.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=16>)

1. M. Avrigeanu and V. Avrigeanu, *α -particle nuclear surface absorption below the Coulomb barrier in heavy nuclei*, *Phys. Rev. C* **82**, 014606 (2010).
2. M. Avrigeanu and V. Avrigeanu, *Additional α -particle optical potential tests below the Coulomb barrier*, *Phys. Rev. C* **81**, 038801 (2010).
3. M. Avrigeanu and V. Avrigeanu, *Alpha-particle optical potential tests below the Coulomb barrier*, *Phys. Rev. C* **79**, 027601 (2009).
4. M. Avrigeanu, A.C. Obreja, F.L. Roman, V. Avrigeanu, and W. von Oertzen, *Complementary optical-potential analysis of alpha-particle elastic scattering and induced reactions at low energies*, *Atomic Data Nucl. Data Tables* **95** (2009) 501.
5. M. Avrigeanu, W. von Oertzen, R.A. Forrest, A. Obreja, F.L. Roman, and V. Avrigeanu, *Analysis of deuteron elastic scattering and induced activation on light and medium nuclei for IFMIF EVEDA*, *Fusion Eng. Des.* **84** (2009) 418.

EURATOM-FUSION projects: TW0(1,2,3,4,5,6,7)-TTMN-001-5, F4E-2008-GRT-014-5, -2010-GRT-056-5x

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IFIN-HH (<http://www.nipne.ro>)

Proposal: *Development of a robust model for risk of exposure after an accidental emission of tritium*

Contact Person: Dr Dan Galeriu (galdan@ifin.nipne.ro, dangaler@yahoo.com)

<http://emras.nipne.ro>, <http://meteo.nipne.ro/logger>

Abstract. The present proposal concerns the development of an updated robust model-code for assessing the public risk after an accidental emission of tritium and must superseded previous codes as ETMOD (AECL) and FDMH (IFIN for RODOS), using recent results obtained by both partners but also under international cooperation with other institution or organisation. It must considers uptake and reemission of tritium by agricultural crops , transformation from tritiated water to organically bound tritium under day and night conditions, transfer in food chain and influence of local habits. The code must be easily adapted for operational use.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=64>)

1. Dan Galeriu, Anca Melintescu, *TRITIUM*, in *RADIONUCLIDES IN THE ENVIRONMENT*, edited by David A. Atwood, John Wiley & Sons, West Sussex, England, 2010, pp. 47-65, ISBN 978-0-47071434-8.
2. P.A. Davis, E. Leclerc, D.C. Galeriu, A. Melintescu, S-R. Peterson, F. Siclet, and P.M. Ravi, *Specific activity models and parameter values for Tritium, 14C and 36Cl*, in *Handbook of parameter values for the prediction of radionuclide transfer to humans in terrestrial and freshwater environments*, IAEA - TRS – 472, International Atomic Energy Agency, Vienna, 2009, ISBN 978-92-0-113009.
3. D Galeriu and A Melintescu, *Retention of tritium in reference persons: a metabolic model. Derivation of parameters and application of the model to the general public and to workers*, [Journal of Radiological Protection](http://dx.doi.org/10.1088/0952-4746/30/3/003) **30** (2010) 445–468 (doi:10.1088/0952-4746/30/3/003).
4. D. Galeriu, P. Davis, W. Raskob, and A. Melintescu, *Recent Progresses in Tritium Radioecology and Dosimetry*, *Fusion Science and Technology* **54** (2008) 237-242.

IFIN-HH FP7 RCNs: 84369, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

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Topic: Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP. The Sustainable Nuclear Energy Technology Platform (SNE-TP) aims to support fully, through R&D activities, the role of nuclear energy in Europe's energy mix, contributing to the security and competitiveness of energy supply, according to its Strategic Research Agenda (SRA) and Deployment Strategy (DS). As mentioned in the SRA, the standardization and monitoring of beta emitters, like tritium, are important for power upgrades of current and future Light Water Reactors, and for materials qualification (HTR/VHTR design). The European Energy Research Alliance (EERA), set up under the Community Strategic Energy Technology Plan (SET-Plan) intends to launch a Joint Programming Action on (nuclear) materials. Support will be provided to coordinate this activity in order to optimize its effectiveness and efficiency. Participation of involved EERA institutions is essential, together with any other key stakeholders in the development/qualification of materials for nuclear energy applications.

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: Characterization of liquid wastes containing beta emitters using a compact LSC-TDCR.

Contact Person: Assoc. Prof. Maria Sahagia (msahagia@nipne.ro)

Abstract. The present proposal concerns the possibility to develop a compact LSC-TDCR (Triple to double coincidence ratio) counter, based on Channel Photomultipliers (CPMs), to be used on site for the measurement of various types of liquid effluents containing low energy beta emitters. Such a model of counter was already set up at IFIN-HH, the Radionuclide Metrology Laboratory, working in parallel with the reference LSC-TDCR counter based on the use of normal photomultipliers. It was characterized for the radionuclides: ^3H , ^{63}Ni , ^{90}Sr , pure beta emitters.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=101>)

1. C. Ivan, A. C. Wätjen, P. Cassette, M. Sahagia, A. Antohe, E. L. Grigorescu. *Participation in the CCRI(II)-K2.H-3 comparison and study of the new TDCR-LS counter with 6 CPMs*, Appl.Radiat.Isot. 68 (2010) 1543.
2. C. Ivan, P.Cassette, and M. Sahagia, *A new TDCR-LS Counter using Channel photomultiplier tubes*, Appl. Radiat. Isot. **66** (2008) 1006-1011.
3. A.C.Razdolescu, Ph. Cassette, and M.Sahagia, *Measurement of Fe-55 solution activity by LSC-TDCR method*, Appl. Radiat. Isot. **66** (2008) 750-755.
4. M.Sahagia, AC Razdolescu, E.L Grigorescu, A.Luca, and C. Ivan, *The collaboration of the Radionuclide Metrology Laboratory from IFIN-HH, owner of the primary activity standard, with units involved in nuclear energy field*, Rom. Rep. Phys. **59** (2007) 787-793.
5. A.C.Razdolescu and P.Cassette, *Standardization of tritiated water and Tl-204 by TDCR liquid scintillation counting*, Appl. Radiat. Isot. **60** (2004) 493 – 498.

IFIN-HH FP7 RCNs: 84429, 84286, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August, 2010
- **Deadline:** 7 April 2011, at 17.00.00, Brussels local time
- **Indicative Budget:** EUR 41 000 000 from 2011 budget

Activity: Reactor Systems: Fission-2

Area: Cross-cutting aspects for nuclear systems

Topic: Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP

Topic: Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP. The Sustainable Nuclear Energy Technology Platform (SNE-TP) aims to support fully, through R&D activities, the role of nuclear energy in Europe's energy mix, contributing to the security and competitiveness of energy supply, according to its Strategic Research Agenda (SRA) and Deployment Strategy (DS). As mentioned in the SRA, availability of accurate nuclear data (cross sections, decay constants, branching ratios etc.) is the basis for precise reactor calculations both for current and new generation reactors. Also, additional experimental measurements and their detailed analysis and interpretation are required, especially for fuels containing minor actinides. The European Energy Research Alliance (EERA), set up under the Community Strategic Energy Technology Plan (SET-Plan) intends to launch a Joint Programming Action on (nuclear) materials. Support will be provided to coordinate this activity in order to optimize its effectiveness and efficiency. Participation of involved EERA institutions is essential, together with any other key stakeholders in the development/qualification of materials for nuclear energy applications.

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: Nuclear decay data evaluations for the fission products of Th/U fuel cycle

Contact Person: Dr. Aurelian Luca (aluca@nipne.ro)

Abstract. The experience of IFIN-HH in the field of nuclear decay data evaluations (member of the DDEP international collaboration - <http://www.nucleide.org/DDEP.htm> and participation to the IAEA CRP F4.20.06) will be used to perform new decay data evaluations for the fission products of Th/U fuel cycle. These new data are essential for accurate calculations of the decay heat of irradiated fuel. All the experimental results available in the scientific publications, including those obtained by total absorption gamma-ray spectroscopy (TAGS/TAS) measurements will be analysed and processed, in order to provide a better characterisation of the nuclear decay schemes of these fission products.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=132>)

1. A. Luca, *Evaluation of ^{234}Th nuclear decay data*, Applied Radiation and Isotopes 68 (2010) 1591.
2. M.A. Kellett, M.-M. Bé, V. Chechev, Huang Xiaolong, F.G. Kondev, A. Luca, G. Mukherjee, A.L. Nichols and A. Pearce, *New IAEA Actinide Decay Data Library*, International Conference ND2010, Jeju Island, Korea, April 26-30, 2010.
3. M. Gupta, M.A. Kellett, A.L. Nichols and O. Bersillon, *Decay heat calculations: Assessment of fission product decay data requirements for Th/U fuel*, Report INDC(NDS)-0577, IAEA, Vienna, Austria, May 2010.
4. R.C. Greenwood, R.G. Helmer, M.A. Lee, M.H. Putnam, M.A. Oates, D.A. Struttmann and K.D. Watts, *Total absorption gamma-ray spectrometer for measurement of beta-decay intensity distributions for fission product radionuclides*, Nucl. Instrum. Meth. in Phys. Res. A314 (1992) 514.

IFIN-HH FP7 RCNs: 84429, 84286, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

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- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: **Reactor Systems: Fission-2**

Area: *Cross-cutting aspects for nuclear systems*

Topic: *Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP*

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP. All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan). Significant participation of national and/or industrial stakeholders is expected.

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Endurance tests of materials in presence of high tritium activities*

Contact Person: Dr. Cristian Postolache (cristi@nipne.ro)

Abstract. Behavior of different materials in presence of high tritium activities is required in selection of materials for used in CANDU NPP tritium facilities. The materials will be exposed to tritium compounds (ex T₂, HTO) for request physical-chemical conditions. After exposure the samples are characterized by spectrometric and chromatographic methods, electronic microscopy, mechanical properties, etc.

Proposal network: IFIN HH Magurele, ICIT Rm Valcea, SCK CEN Belgium, FZK, Germany and AECL Canada.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=172>)

1. C. Postolache, Lidia Matei, Rodica Georgescu, *Self-radiolytical Processes in Ethyl-Phenyl Siloxanes Labelled with Tritium*, J Radioanalytical and Nuclear Chemistry, **280**, 2 (2009) 251–258
2. Lidia Matei, C Postolache, I Cristescu, S Brad, *Behavior of Nafion Perfluorosulfonate Ionomer Membranes in Presence of Tritiated Water*, Fusion Science and Technology, **54**, (2008), 474-478
3. S Brad, I Stefanescu, L Stefan, M Vijulie, N Soflica,, A Bornea, F Vasut, M Zamfirache, N Bidica, C Postolache, L Matei, *Experimental stand for studies of hydrogen isotopes permeation*, Fusion Science and Technology, **54**, (2008), 530-532
4. Lidia Matei, C Postolache, *Radiolysis of polytetrafluoroethylene and polystyrene catalytic supports in presence of tritiated water*, Radiation Physics and Chemistry **76** (2007), 1257-1262
5. C Postolache, Lidia Matei, Rodica Georgescu, Gh Ionita, *Optimal parameter determination for tritiated water storage in polyacrylic networks*, Fusion Science and Technology, **48**, (2005), 220-223

EURATOM PROJECTS: W4-FT-2.20/2004: *Endurance Test for the Catalyst-Packing Mixture proposed for Water Detritiation System at JET using SCK-CEN Mixture*

TW6-TTFD-TR64/2008: *Endurance tests of WDS Components*

IFIN-HH FP7 RCNs: 84429, 84430, 84286, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

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Activity: **Reactor Systems: Fission-2**

Area: Cross-cutting aspects for nuclear systems

Topic: Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP. All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan). Significant participation of national and/or industrial stakeholders is expected. It is viewed that the active participation of relevant partners from third countries should add to the scientific and/or technological excellence of some projects and/or lead to an increased impact of the research to be undertaken.

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Incinerator for low and medium activities tritium wastes, resulted from CANDU NPP*

Contact Person: Dr. Cristian Postolache (cristi@nipne.ro)

Abstract. The aim of proposal is to create an experimental data base and facilities concerning identification of optimal condition to processing of liquid and solid tritium wastes resulted from CANDU NPP.

Proposal network: IFIN HH Magurele, ICIT Rm Valcea, SCK CEN Belgium, FZK, Germany and AECL Canada.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=172>)

1. C. Postolache, Lidia Matei, Rodica Georgescu, *Self-radiolytical Processes in Ethyl-Phenyl Siloxanes Labelled with Tritium*, J Radioanalytical and Nuclear Chemistry, **280**, 2 (2009) 251–258
2. Lidia Matei, C Postolache, I Cristescu, S Brad, *Behavior of Nafion Perfluorosulfonate Ionomer Membranes in Presence of Tritiated Water*, Fusion Science and Technology, **54**, (2008), 474-478
3. S Brad, I Stefanescu, L Stefan, M Vijulie, N Soflica,, A Bornea, F Vasut, M Zamfirache, N Bidica, C Postolache, L Matei, *Experimental stand for studies of hydrogen isotopes permeation*, Fusion Science and Technology, **54**, (2008), 530-532
4. Lidia Matei, C Postolache, *Radiolysis of polytetrafluoroethylene and polystyrene catalytic supports in presence of tritiated water*, Radiation Physics and Chemistry **76** (2007), 1257-1262
5. C Postolache, Lidia Matei, Rodica Georgescu, Gh Ionita, *Optimal parameter determination for tritiated water storage in polyacrylic networks*, Fusion Science and Technology, **48**, (2005), 220-223

EURATOM PROJECTS: W4-FT-2.20/2004: *Endurance Test for the Catalyst-Packing Mixture proposed for Water Detritiation System at JET using SCK-CEN Mixture*

TW6-TTFD-TR64/2008: *Endurance tests of WDS Components*

IFIN-HH FP7 RCNs: 84429, 84430, 84286, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities

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Activity: **Reactor Systems: Fission-2**

Area: *Cross-cutting aspects for nuclear systems*

Topic: *Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP*

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP (www.snetp.eu). All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan).

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *Positron Annihilation Spectroscopy in material studies*

Contact Person(s): Dr. Florin Constantin (fconst@ifin.nipne.ro)

Abstract The development of a positron annihilation spectroscopy laboratory at the IFIN-HH Bucharest, to be used for material studies and applications, was started. Experiments (CDBS) were conducted on neutron irradiated Aluminum (structural aluminum from our research nuclear reactor) with our CAEN multiparametric acquisition system. The work is in progress and we plan to extend the research on polymers.

References: (<http://www.nipne.ro/research/publications/publications.php?user=46>)

1. Angela Vasilescu, L. Craciun, Ionica A. Ghita, O. Constantinescu, F. Constantin, Catalina Chiojdeanu, C. N. Zoita, A. Kiss, D. Bojin and P.M. Racolta, *Status of an R&D project of a Positron Gun at IFIN-HH Bucharest*, Applied Surface Science **255** (2008) 46–49.
2. Florin Constantin, Liviu Stefan Craciun, Olimpiu Constantinescu, Ionica Alina Ghita, Cristina Ionescu, Petru Mihai Racolta, Mihai Straticiu, Angela Vasilescu, Viorel Braic, Catalin Zoita, Adrian Kiss, Dionezie Bojin, *Status and perspectives for a slow positron beam facility at IFIN-HH Bucharest*, AIP Conference Proceedings vol. 1099, March 10, 2009, 960-964.

IFIN-HH FP7 RCNs: 84276 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

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- **Date of publication:** 20 August 2010
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Activity: **Reactor Systems: Fission-2**

Area: *Cross-cutting aspects for nuclear systems*

Topic: *Fission-2011-2.3.1: R&D activities in support of the implementation of the Strategic Research Agenda of SNE-TP*

R&D activities to initiate, design and develop ideas, projects or programmes, or to perform supporting research, in line with the Strategic Research Agenda (SRA) and according to the priorities in the Deployment Strategy (DS) of SNE-TP (www.snetp.eu). All subjects within scope of both the SRA/DS and the Specific Programme can be proposed, except those for which a specific topic exists in the current work programme or considered adequately covered in past or on-going Euratom research. In this context, crosscutting refers either to the nature of the research (i.e. applicable to more than one nuclear system) or to the interest from a broad range of stakeholders and national programmes; in any case, priority will be given to those areas most amenable to a genuine collaborative effort within Europe. Good awareness of and synergies with other relevant initiatives are crucial, e.g. nuclear-related research programmes by EERA (the European Energy Research Alliance under the SET-Plan).

Funding Scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting) and a maximum one large-scale Collaborative Project

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *Hypersensitive study by AMS of Tritium and Deuterium trapping materials used at Detritiation facilities of Heavy Water*

Contact Person(s): Dr. Mihaela Enachescu (menache@nipne.ro)

Abstract: The aim of our project is the investigation by Accelerator Mass Spectrometry (AMS) of Tritium and Deuterium mobility and absorption in different metallic materials like: Ti, Zn, V, Pd (Cu, Al), and glassy carbon. AMS has an extremely high sensitivity in detection of small quantities of Hydrogen isotopes in solid samples. It is able to measure down to 10^6 in sample material. An other advantage of AMS is its capability to perform the concentration depth profiling. In this way it can provide very useful information for the process of migration, infiltration, absorption etc. Such materials will be used in detritiation plants of heavy water from nuclear power plants, with the final aim of environment and life protection.

References: (<http://www.nipne.ro/research/publications/publications.php?user=331>)

1. Mihaela Enachescu, V. Lazarev, and C. Stan-Sion, *Unfolding Procedure for AMS depth profiling*, J. Phys. D: Appl. Phys. **39** (2006) 2876-2880.
2. Stan-Sion, Mihaela Enachescu, and Marius Stefan Dogarandu, *Environmental Radionuclides Measured by AMS Catalin*, in *NATO Advanced Training Course: New Techniques for the Detection of Nuclear and Radioactive Agents*, Mugla, Turkey, May 26-30, 2008.

IFIN-HH FP7 RCNs: 84276 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011
Euratom for Nuclear Research and Training Activities
(European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August 2010
- **Deadline:** 07 April 2011, at 17.00.00, Brussels local time
- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: **Radiation Protection:Fission-3**

Area: *Quantification of risks for low and protracted exposures*

Topic: *Fission-2011-3.1.1: Contribution to low-dose risk research in Europe*

In line with the HLEG vision report (www.hleg.de) and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionising radiation, for example the shape of dose-response relationships and tissue sensitivity for cancer, individual variability in radiation sensitivity, health effects of different radiation quality types, risks from internal exposure to radiation, and non-cancer effects of radiation. Research should focus on those areas/directions identified and prioritised by MELODI as the most promising in terms of addressing/resolving key issues in the vision / SRA. A multi-disciplinary approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modelling assumptions. It is essential to include interfaces with the broader (i.e. non-radiation) biological and epidemiological communities that can bring new ideas or methodologies to radiation protection research.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *Non-targeted effects induced by low dose rate irradiation in endothelial cells. .*

Contact Person(s): Dr. Diana Savu (dsavu@nipne.ro), Dr. Mihai Radu (mradu@nipne.ro)

Abstract. *Aim:* Contributing with experimental data and enlarging the knowledge of possible mechanisms underlying the potential risks of low dose rate irradiation especially in the field of non-cancer effects and cardiovascular diseases.

Objectives: Chronic low dose rate irradiation induced effects in endothelial cells

Experimental approach: Cs 137 gamma irradiation (max 30 mGy/h); In vitro endothelial cell cultures; End-points: DNA fragmentation (comet assay – alkaline and alkaline with repair endonucleases); VEGF binding affinity; Apoptotic aspects; Measurements of oxidative stress biomarkers; Cytokines.

Modified radiosensitivity and bystander effects in lymphocytes-endothelial cells co-cultures.

Experimental approach: Cs 137 gamma irradiation (max 30 mGy/h); In vitro endothelial and lymphocytes cell cultures.

End-points: MN induction, DNA fragmentation (comet assay – alkaline and alkaline with repair endonucleases); VEGF binding affinity; apoptosis, antioxidant activity, protein oxidation (Carbonil content), cytokines.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=263>)

1. M. Florescu *et al.*, “Supranormal” cardiac function in athletes related to better arterial and endothelial function- Ventriculo-arterial interaction in athletes, accepted in Echocardiography, DOI: 10.1111/j.1540-8175.2009.01121.x).
2. N. Mocanu *et al.*, A fluorescence approach of the gamma radiations effects on gramicidin A inserted in liposomes. Journal Peptide Science **14** (2008) 1003-1009.
3. Petcu *et al.*, In vitro radiosensitivity of peripheral blood lymphocytes in multiple sclerosis patients, International Journal of Radiation Biology **82** (2006) 793-800.

IFIN-HH FP7 RCNs: 84369, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011
Euratom for Nuclear Research and Training Activities
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- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20th August, 2010
- **Deadline:** 07 April 2011, at 17.00.00, Brussels local time
- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: **Radiation Protection:Fission-3**

Area: *Quantification of risks for low and protracted exposures*

Topic: *Fission-2011-3.1.1: Contribution to low-dose risk research in Europe*

In line with the HLEG vision report (www.hleg.de) and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionising radiation, for example the shape of dose-response relationships and tissue sensitivity for cancer, individual variability in radiation sensitivity, health effects of different radiation quality types, risks from internal exposure to radiation, and non-cancer effects of radiation. Research should focus on those areas/directions identified and prioritised by MELODI as the most promising in terms of addressing/resolving key issues in the vision / SRA. A multi-disciplinary approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modelling assumptions. It is essential to include interfaces with the broader (i.e. non-radiation) biological and epidemiological communities that can bring new ideas or methodologies to radiation protection research. Any successful proposal will strictly avoid duplication of past and on-going research. It is viewed that the active participation of relevant partners from third countries should add to the scientific and/or technological excellence of some projects and/or lead to an increased impact of the research to be undertaken.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *The assessment of the radiological impact on the environment during the nuclear reactor decommissioning; set up of a database concerning the radioactivity levels in IFIN-HH area as well as in the surrounding areas*

Contact Person: Dr. Ana Stochioiu (stoc@nipne.ro),

Abstract. *Aim:* The determination of the radiological impact of these new occurred levels of activity and ambient equivalent dose rate.

Objectives: We propose to study the impact of the nuclear reactor decommissioning by:

-The measurement of the activity of usual and new alpha, beta, gamma emitters which occur in the immediate area of operation and in the surrounding zone after the decommissioning start, and continuous dosimetric (TLD) monitoring, during the whole decommissioning period.

-The comparison of these measurement results with the reference activity and ambient equivalent dose rate levels existent in our data bases, before decommissioning start.

References see also <http://www.nipne.ro/research/publications/publications.php?user=425>)

1. A. Stochioiu, M. Sahagia, S. Bercea, F. Mihai, I. Tudor, *Use of the passive dosimeters for the mapping of the radiation level in areas involved in work with radioactive sources*, Romanian Journal Physics **53**, 1 (2008).
2. A. I. Stochioiu, M. C. Sahagia, F. Mihai, I. Tudor, H. Lupescu, *Application of the thermoluminescent dosimeters for the measurement of low level background*, American Institute of Physics 978-0-7354-0404-5/07.
3. A. Stochioiu, M. Sahagia, S. Bercea, C. Ivan, I. Tudor *Monitoring of the radioactivity concentration of air in the area of the IFIN-HH, Romania* ; Romanian Reports in Physics **61**, 581-586 (2009)
4. Stochioiu Ana, Bercea Sorin, Sahagia Maria, Ivan Constantin, Tudor Ion, Celarel Aura *The Measurements of the Natural Background in a Salt Mine*, Third European IRPA congress, 14-18 June, 2010, Helsinki, Finland
5. A. Stochioiu, I. Tudor, A. Gheorghiu, *Research and Applications in the Laboratory for Environmental and Personnel Dosimetry*, Third European IRPA congress, 14-18 June, 2010, Helsinki, Finland.

IFIN-HH FP7 RCNs: 84423, 84369, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities

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Activity: **Radiation Protection: Fission-3**

Area: *Quantification of risks for low and protracted exposures*

Topic: **Fission-2011-3.1.1: Contribution to low-dose risk research in Europe.**

In line with the HLEG vision report and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionising radiation, for example the shape of dose-response relationships and tissue sensitivity for cancer, individual variability in radiation sensitivity, health effects of different radiation quality types, risks from internal exposure to radiation, and non-cancer effects of radiation. Research should focus on those areas/directions identified and prioritised by MELODI as the most promising in terms of addressing/resolving key issues in the vision /SRA. A multi-disciplinary approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modelling assumptions.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting)

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Epidemiological studies on non cancer effect of radiation*

Contact Person: Dr. Cristian Postolache (cristi@nipne.ro)

Abstract. We aim to develop multidisciplinary research in the field of **low dose radiation risk assessment**, addressing health issues specific for nuclear activities in **CANDU power plant**.

Personnel from **nuclear and fuel power plant**, concurrently exposed to internal and external ionizing radiation, will be enrolled. We will focus on protein **biomarkers discovery**, using state-of-the-art technologies (mass spectrometry based technologies, like SELDI-TOF, ICP-MS; multicolour flow cytometry etc). Taking advantage of the progress in immunology we intend to perform an in-depth **immunological screening** of the workers, in order to investigate the potential correlation between low-dose radiation and **non-cancer disturbances**.

It is worth mentioning that the study answers key issues defined for the European area by the MELODI platform and by the DoReMi network of excellence, whose efforts in the field of low-dose risk assessment we intend to join (contact: Prof. Laure Sabatier, Radiobiology and oncology laboratory, CEA, France, laure.sabatier@cea.fr).

References (see also <http://www.nipne.ro/research/publications/publications.php?user=172>)

1. V. Lungu, D. C. Postolache, L. Matei, C. Barna, G. Bubueanu, *In vivo studies with [methyl-3H]-thymidine regarding the effect of methyl donors cocktail in cancer therapy*, J of Radioanalytical and Nuclear Chemistry **280** (2009) 385–387.
2. L. Matei, C. Postolache, C. Podina, *Preparation of ³H-labelled Testosterone Metabolites*, J of Labelled Compounds and Radiopharmaceuticals **50** (2007) 442-443.
3. C. Postolache, C. Tanase, L. Matei, V. Serban, *Synthesis of [5-3H]Uracil Nucleoside Analogue*, Journal of Labelled Compounds and Radiopharmaceuticals **50** (2007) 609-610.

IFIN-HH FP7 RCNs: 84429, 84430, 84286, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011
Euratom for Nuclear Research and
Training Activities
(European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August 2010
- **Deadline:** 7 April 2011, at 17.00.00, Brussels local time
- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: Radiation Protection

Area: *Quantification of risks for low and protracted exposures*

Topic: *Fission-2011-3.1.1: Contribution to low-dose risk research in Europe*

In line with the HLEG vision report (www.hleg.de) and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionizing radiation, for example the shape of dose-response relationships and tissue sensitivity for cancer, individual variability irradiation sensitivity, health effects of different radiation quality types, risks from internal exposure to radiation, and non-cancer effects of radiation. Research should focus on those areas/directions identified and prioritized by MELODI as the most promising in terms of addressing/resolving key issues in the vision / SRA. A multi-disciplinary approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modeling assumptions. It is essential to include interfaces with the broader (i.e. non-radiation) biological and epidemiological communities that can bring new ideas or methodologies to radiation protection research.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *Three-dimensional Tomography for Positron Emission Tomography (PET)*

Contact person: Dr. Florin Constantin (fconst@ifin.nipne.ro)

Abstract. The aim of this project is to realize a 3D tomography demonstrator for Positron Emission Tomography (PET). The fundament of the project consists in a new approach for the detection of coincidence gamma-rays by using:

- planar gamma-ray detectors;
- bi-dimensional images acquisition for detectors and gamma-ray impact identification;
- reconstruction of the coincidence gamma-rays trajectories and their validation;
- 3D image reconstruction for rectangular detection geometry.

References (see also: <http://www.nipne.ro/research/publications/publications.php?user=46>)

1. F. Constantin and F. Turcu, *Whole body PET based on an RPC system*, in IEEE Nuclear Science Symposium Conference Record, Book Series: vols. 1-7, 2004, pp. 3826-3830.
2. I. Cruceru, I. Manea, C. Nicorescu, and F. Constantin, *Perspectives for Positron Emission Tomography with RPCs*, in *Int. Conf. on Imaging Techniques in Subatomic Physics, Astrophysics, Medicine, Biology and Industry* (IMAGING 2003), 24 – 27 June 2003, Stockholm, Sweden.

IFIN-HH FP7 RCNs: 84276 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011
Euratom for Nuclear Research and Training Activities
(European Commission C(2010) 5704 of 20 August 2010)

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- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: Radiation Protection
Area: *Quantification of risks for low and protracted exposures*
Topic: *Fission-2011-3.1.1: Contribution to low-dose risk research in Europe*

In line with the HLEG vision report (www.hleg.de) and/or Strategic Research Agenda (SRA) of MELODI (www.melodi-online.eu), support will be provided for projects addressing identified key issues relating to risk from low and protracted exposure to ionizing radiation, for example the shape of dose-response relationships and tissue sensitivity for cancer, individual variability irradiation sensitivity, health effects of different radiation quality types, risks from internal exposure to radiation, and non-cancer effects of radiation. Research should focus on those areas/directions identified and prioritized by MELODI as the most promising in terms of addressing/resolving key issues in the vision / SRA. A multi-disciplinary approach will be required aiming to assess health effects through integration of radiobiological research and epidemiological studies of groups exposed to low doses in order to better substantiate conceptual/computational modeling assumptions. It is essential to include interfaces with the broader (i.e. non-radiation) biological and epidemiological communities that can bring new ideas or methodologies to radiation protection research.

Funding scheme: Small or medium-scale Collaborative Projects and/or Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro/>)

Proposal: *Interdisciplinary Accelerator Mass Spectrometry Applications*

Contact Person(s): Dr. Catalin Stan Sion (stansion@nipne.ro)

Abstract We emphasize three main fields of interest already in our focus:

- (a) The ^{129}I , the monitoring possibilities of the AMS
- (b) Health and environment protection. Due to their high sensitivity, the AMS measurements can determine the Tritium leaks from the unsealed parts of the nuclear installations, of the tritium separation facilities and also the respective spread in the neighboring clean spaces. In this way, the identification of any unsealed or defective parts/procedures becomes possible.
- (c) AMS measurements enable study of metabolic risks caused by high Al concentrations (Alzheimer disease), the precise determination by AMS of absorption, retention and general of the biokinetics of some oligoelements in the human and animal metabolic system.

The research will be focused on the investigation of the topics presented before using the AMS assembly within the IFIN-HH Bucharest.

References: (<http://www.nipne.ro/research/publications/publications.php?user=127>)

1. C. Stan-Sion, J. Roth, K. Krieger, M. Enăchescu, K. Ertl, V. Lazarev, H. Reithmeier and E. Nolte, AMS – Sensitive tool used as nuclear safeguard and to diagnose fusion experiments, Nucl. Instr. Meth. in Phys. Research B **259** (2007) 694-701.
2. Investigation of the human aluminium biokinetics with ^{26}Al and AMS, G. Kislinger, C. Steinhausen, M. Alvarez-Buckmann, C. Stan-Sion, Nuclear Instruments and Method in Physics Research B **123** (1997) 259-265.

IFIN-HH FP7 RCNs: 84276 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

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Activity: **Infrastructures: Fission-4**

Area: **Supporting infrastructures**

Topic: **Fission-2011-4.2.1: Transnational access to large infrastructures.**

Community support will be provided to cover costs of Transnational Access to Large Infrastructures (TALI) for researchers from Member States and Associated States, other than the state where the infrastructure is established, in order to promote access for researchers to infrastructures that provide essential and unique services to the European research community. Access to researchers from 3rd countries could also be envisaged, where such access is part of the promotion of broader international cooperation with the countries concerned. The active participation of major infrastructure operators and potential users will be required to achieve the objectives. **Funding Scheme:** Coordination and Support Actions (supporting).

IFIN-HH (<http://www.nipne.ro>)

Proposal: Open access at U-120 Cyclotron facility for Ion Beam Applications

Contact Person: Dr. Dorin Dudu (ddudu@nipne.ro)

Abstract The present proposal concerns the optimized use of existing accelerating infrastructure U-120 Cyclotron at IFIN-HH in the field of Ion Beam Applications as are high flux fast neutron generation and on/off-line radiation hardness tests of materials and equipment, elemental and structural analysis via RBS, NRA, PIXE and on/off-line studies of producing defects by irradiation with accelerated particle and the corresponding changes of some properties of irradiated material. Also, radioisotopes production and surface activation for wear and corrosion studies are possible. Actually, the parameters of delivered beams and corresponding uses are listed in the table.

Particle beams and available applications

Particle/Energy [MeV]	Intensity on target [μ A]	Transversal section	Application
P,d/13,5	1-20	0,25-2cm ²	Radioisotopes production, surface activation, fast neutron production
α /27	1-10	0,25-2 cm ²	Radioisotopes production
α /2,7-5	0.01-1	1-30mm ²	RBS, PIXE, analysis and controlled changes and defects induced by particles irradiation
d/1,3-2,5	0.01-1	1-30mm ²	RBS, NRA analysis
¹⁴ N ⁺⁽²⁺⁾ /4-10	0.01-0,1	1-30mm ²	RBS, ERDA analysis

There are possibilities also for experiments involving alpha micro beams for analysis of surface micro structured samples. Former, present and possible user of U-120 Cyclotron infrastructure involved in national and EU research projects are INFLPR, IFTM, Tech. Univ. Cluj Napoca, University "Politehnica Bucharest, University Limerick (Ireland), Technical University Muenchen (Germany), INFN-Catania, Universita degli Studi di Milano, Istituto del Fisica del Plasma-Piero Caldiola (Italy). The access of researchers will be accompanied by active participation of major infrastructure operators and scientist to achieve the objectives.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=59>)

1. Sporea, D; Vata, I; Dudu, D; and Danis, J. Nucl. Mat. B 329 (2004) 1062-1065.
2. Dan Sporea, Adelina Sporea, Ion Vata, *Proceedings of Photonics North, 2007, Ottawa, Canada.*
3. H. Schubert, D. Dudu, I. Vata, *Int. Workshop Low current, low energy beam diagnostics, Heidelberg 2009*
4. C.P.Lungu, I.Mustata, A.Anghel, C.C.Surdu-Bob, P.Chiru, A.M.Lungu, V.Zaroschi, M.Ganciu, A. Surmeian, C.Diplasu, C.Oproiu, R.Minea, M.N.Nemtanu, G.Burcea, V.Turcanu, O.Dutulescu, I. Vata, E.Ivanov, D.Dudu et al., *34th EPS Conf. on Plasma Phys., Warsaw, 2-6 July 2007, ECA 31F, 2070 (2007).*

IFIN-HH FP7 RCNs: 84417 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

EURATOM for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August 2010
- **Deadline:** 7 April 2011, at 17.00.00, Brussels local time
- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: Human Resources, Mobility and Training: Fission-5

Area: Training & mobility of research workers

Topic: Fission-2011-5.1.1: Euratom Fission Training Schemes (EFTS) in nuclear energy and radiation protection

An EFTS should encourage the involvement of young researchers, address life-long learning and career development of experienced researchers, maximise transfer of higher-level knowledge and technology with emphasis on multi-disciplinarily, trans-national and inter-sectoral mobility of trainees as well as trainers (e.g. industry-academia partnerships across the EU), use a systematic approach to higher-level training (e.g. analysis, design, development, implementation and evaluation) and develop best practice guidelines on the basis of the lessons learned. Proposals for EFTS should be submitted by networks of (host) organisations, consisting of academia and 'future employers'. 'Think tank' activities should be organised (for instance in line with the strategy of SNE-TP, IGD-TP or MELODI) with the aim to anticipate future training needs and to support policies for the creation of an 'internal market' of nuclear research workers. An EFTS should consist of a mix of collective and/or individual courses and internships addressing a variety of profiles as appropriate (from young recruits to top managers). The drafting and co-funding of co-authored textbooks at higher education level should take place under the control of an international review committee. It is viewed that the active participation of relevant partners from third countries or international organisations should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators. Any applied or basic science theme within scope of Euratom FP7 (fission and radiation protection) can be proposed provided it is not already the subject of an EFTS from previous calls. Euratom funding will principally be for the coordination and networking aspects, i.e. scientific secretariat, implementation of joint training programmes, organisation of training events (for example, on the occasion of international conferences), mobility of Page 23 of 41 trainers and trainees, access to research and training facilities, etc.

Funding scheme: Maximum of 3 Coordination and Support Actions (coordinating)

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Applied Workshop on Decommissioning of a VVR-S Type Research Reactor*

Contact Person: Dr. Mitica Dragusin (dragusin@nipne.ro; <http://www.nipne.ro/management/cv/nsd.pdf>)

Abstract. The present proposal is concerning the organisation of an applied workshop on practical matters regarding the decommissioning a IFIN-HH Research Reactor of VVR-S Type. The duration of the decommissioning project is 11 years from 2010 and it will be implemented in three main phases. Each phase will comprise working packages in the form of activities, actions and tasks. Every component from this Work Breakdown Structure will be optimised and ALARA principle will be applied. This will imply preparatory activities (including training for workers) for dismantling the internal components from reactor core, decontamination of the hot cells, dismantling the primary circuit dismantling of the secondary circuit, dismantling the internal components from reactor block, demolition of reactor block, de-aerator, hot cells, dismantling the active drainage up to 30 m³ of the underground pond and the final radiological survey. On each of the working package, a training workshop will be organized in order to observe and document the activities being performed as they unfold in real-time. Thus a very useful and innovative insight on the decommissioning activities will be provided to all the interested parties such as representatives of system suppliers, energy providers, safety authorities, users of ionising radiation in medicine and industry, waste management agencies, etc.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=326>)

1. M. Dragusin, A. Pavelescu, I. Iorga *Elaboration of the cost calculation methodology for the radwaste generated by the decommissioning of the VVR-S Magurele research reactor*, Proceedings of the European Nuclear Conference, ENC 2010, Barcelona, May, 2010, ISBN 978-92-95064-09-6.
2. M. Dragusin, *Good Practices in the Nuclear Research Reactor VVR-S Magurele-Bucharest Romania Decommissioning Planning and Starting the Project*, DDR 2010, Proceedings of 2010 American Nuclear Society Topical Meeting on Decommissioning & Decontamination & Reutilization, USA, 30 August- 3 September, Idaho Falls, IL, 2010.
3. A.O. Pavelescu, V. Popa, M. Dragusin, *Modelling of the Dose Rates and Risks Coming from Hot-cells Clean-up Activities in the VVR-S Research Reactor Decommissioning*, Rom. J. Physics (in press).

IFIN-HH FP7 RCNs: 84341, 83614 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

EURATOM for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

- **Call Identifier:** FP7-Fission-2011
- **Date of publication:** 20 August 2010
- **Deadline:** 7 April 2011, at 17.00.00, Brussels local time
- **Indicative budget:** c. EUR 41 000 000 from 2011 budget

Activity: **Cross-cutting Actions:**

Area: *Cross-cutting actions*

Topic: *Fission-2011-6.0.2: Enhancing involvement of New Member States*

Support will be provided for projects that can demonstrably lead to improved participation of New Member States' partners in Euratom Framework Programme actions. Several New Member States have civil nuclear power programmes, and in the Central and East European region in general there is broad and high-level technical expertise in a wide range of nuclear fission-related subjects. In any event, the actions under this topic are intended to facilitate any process that can lead to increased involvement of these countries in any of the Euratom FP activities. The topic is not to support actual R&D per se, rather to support, for example, (i) networking activities, either of universities and/or research institutes within the region and with similar organisations in the "Old MS"; (ii) pilot studies to investigate how specific organisations or institutes can better exploit their competences and can integrate more effectively in Community activities, perhaps through a process of internal reorganisation; (iii) outreach activities enabling such organisations to become more closely involved in Community fission-related initiatives or to better exploit their competences; or combinations of these and/or other duly justified actions. Proposals will not be welcome that focus on cooperation in very specific R&D areas, the aim is rather to launch generic projects that can produce results across the board. Nonetheless, synergies may be needed with current projects, or projects specifically dealing with research infrastructure and/or education & training (e.g. EFTS under II.2.5.1 of this Work Programme). A strong involvement of appropriate organisations from New MS is of course essential, though projects will often need to include partners from the 'Old MS' as well.

Funding Scheme: Coordination and Support Actions (coordinating or supporting)

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Networking dismantling and decontamination technologies for VVR-type research reactors decommissioning*

Contact Person: Dr. Mitica Dragusin (dragusin@nipne.ro; <http://www.nipne.ro/management/cv/nsd.pdf>)

Abstract. On the basis of IFIN-HH decommissioning project for the VVR-S research reactor started in 2010, a model for similar actions within New Member States could be established by using the experience and support of the IAEA-Vienna R²D² project (<http://www-ns.iaea.org/projects/r2d2project/>) as well as the basic European knowledge on decommissioning of nuclear installations (<http://www.eu-decom.be/>). Since the immediate dismantling strategy of the VVR-S reactor at IFIN-HH will be implemented in 2010-2020, utilization of good practices, sharing the experience, information and knowledge on the dismantling and decontamination scheduled activities, as well as the resulted material management could be quite useful for assistance of New Member States on implementing the safe decommissioning of research reactors. The IFIN-HH decommissioning project will comprise working packages in the form of activities, actions and tasks. Every component from this Work Breakdown Structure will be optimised and ALARA principle will be applied. Preparatory activities, including workers training, for decontamination, dismantling and demolition structures, systems, equipment and components (hot cells, reactor core, primary and secondary circuits, de-aerator, reactor block, active drainage, other utilities), final radiological survey and release criteria for buildings as well as environmental area foreseen in the decommissioning plan will be thus concerned. Consequently a useful and innovative insight on the decommissioning activities could be shared in activities of the types (i) and (iii) mentioned within the Euratom Work Programme 2011 between the interested parties such as representatives of system suppliers, energy providers, safety authorities, users of ionising radiation in medicine and industry, and waste management agencies.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=326>)

1. M. Dragusin, A. Pavelescu, I. Iorga *Elaboration of the cost calculation methodology for the radwaste generated by the decommissioning of the VVR-S Magurele research reactor*, Proc. European Nuclear Conf., ENC 2010, Barcelona, May 2010.
2. M. Dragusin, *Good Practices in the Nuclear Research Reactor VVR-S Magurele-Bucharest Romania Decommissioning Planning and Starting the Project*, Proc. 2010 ANS Topical Meeting on Decommissioning & Decontamination & Reutilization, USA, 30 August- 3 September, Idaho Falls, IL, 2010.
3. A.O. Pavelescu, V. Popa, M. Dragusin, *Modelling of the Dose Rates and Risks Coming from Hot-cells Clean-up Activities in the VVR-S Research Reactor Decommissioning*, Rom. J. Physics (in press).

IFIN-HH FP7 RCNs: 84341, 83614 (http://cordis.europa.eu/fp7/partners_en.html)

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Activity: **Cross-cutting Actions: Fission-6**

Area: Cross-cutting aspects for nuclear systems

Topic: Fission-2011-6.0.1/6.0.2: Actions supporting programme implementation and other activities/ Enhancing involvement of New Member States

The topic covers the promoting (e.g. innovation and uptake of results) and facilitating of communication and dissemination, contributing to achievement of strategic objectives (e.g. pilot initiatives on benchmarking, mapping, networking, etc.) and preparation of possible future Community actions (e.g. prospective studies, exploratory measures, pilot actions, etc.).

Support will be provided for projects that can demonstrably lead to improved participation of New Member States' partners in Euratom Framework Programme actions. Several New Member States have civil nuclear power programmes, and in the Central and East European region in general there is broad and high-level technical expertise in a wide range of nuclear fission-related subjects. Nonetheless, the participation of partners from these countries is often under par in the Euratom fission and radiation protection indirect actions programme. The reasons for this are numerous, complex and often deep rooted, and to be resolved fully may require fundamental action at national level. The precise reasons also vary from country to country. Nonetheless, the greater involvement of these countries in the FP actions will bring benefits for the Community as a whole and not only for the New Member States concerned.

Funding Scheme: Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro>)

Proposal: *Customization of RODOS (Real-time On line Decision Support System) expert system to support decision makers in a case of accidental release at CANDU NPP-Cernavoda Romania*

Contact Person(s): Dr. Dorina Gheorghiu (dorina@nipne.ro),
Dr. Stelian Dan Slavnicu (dansla@nipne.ro)

Abstract. The The RODOS project was launched in 1989 and developed through the European Commission's 3rd to 7th Framework Programmes (FP7-Fission-2011 project NERIS-TP). Up to 40 institutes from some 20 countries in the European Union, Central and Eastern Europe and the Former Soviet Union were actively involved in the project. It can be used in national or regional nuclear emergency centers, providing coherent support at all stages of an accident (i. e., before, during and after a release), including the long term management and restoration of contaminated areas. The system was customized for Romanian conditions and installed in the Nuclear Accident and Radiological Emergency Centre of General Inspectorate for Emergency Situation. One of the important RODOS input data is accident source term data base for nuclear power plants, such as CANDU – 6 reactor, and a comprehensive and updated study of severe accidents could be very useful for RODOS system.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=122>)

1. D.Vamanu, D.Slavnicu, D.Gheorghiu, V.Acasandrei, E.Slavnicu, *The Hydrological Impact Assessment in the Decision Support of Nuclear Emergency Response*, Radiation Protection Dosimetry **140** (2010) 191-201.
2. D.Galeriu, A.Melintescu, D.Slavnicu, D.Gheorghiu, V.Simionov, *Accidental release of tritiated water - toward a better radiological assessment*, Radioprotection **44** (2009) 177-184.
3. D.Slavnicu, D.Vamanu, D.Gheorghiu, V.Acasandrei, B.Vamanu, *Decision support systems and emergency response exercises - lessons and issues*, Radioprotection **44** (2009) 97-102

IFIN-HH FP7 RCNs: 83614, 83647, 83653, 83761 (http://cordis.europa.eu/fp7/partners_en.html)

WORK PROGRAMME 2011

Euratom for Nuclear Research and Training Activities (European Commission C(2010) 5704 of 20 August 2010)

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Activity: **Cross-cutting Actions: Fission-6**

Area: Cross-cutting aspects for nuclear systems

Topic: Fission-2011-6.0.2: Actions supporting programme implementation and other activities/
Enhancing involvement of New Member States

The topic covers the promoting (e.g. innovation and uptake of results) and facilitating of communication and dissemination, contributing to achievement of strategic objectives (e.g. pilot initiatives on benchmarking, mapping, networking, etc.) and preparation of possible future Community actions (e.g. **prospective studies, exploratory measures, pilot actions**, etc.).

Support will be provided for projects that can demonstrably lead to improved participation of New Member States' partners in **Euratom Framework Programme actions**. Several New Member States have civil nuclear power programmes, and in the Central and East European region in general there is broad and high-level technical expertise in a wide range of nuclear **fission-related subjects**. Nonetheless, the participation of partners from these countries is often under par in the Euratom fission and radiation protection indirect actions programme. The reasons for this are numerous, complex and often deep rooted, and to be resolved fully may require fundamental action at national level. The precise reasons also vary from country to country. Nonetheless, the greater involvement of these countries in the FP actions will bring benefits for the Community as a whole and not only for the New Member States concerned.

Funding Scheme: Coordination and Support Actions (coordinating or supporting).

IFIN-HH (<http://www.nipne.ro>)

Proposal: „Nuclear-Analytical-Mat” – *the first Analytical Euro-Network focused on a complex characterisation of (nuclear) materials including micro-nano-structures*

Contact Person: Dr. Emanuela Cincu (cincue@nipne.ro)

Abstract. „Nuclear Analytical-Mat” is an European network composed of 10 analytical laboratories from Research Institutes & Universities from 5 EU countries, of which 3 are new MS; it includes young people, and specialists highly experienced in: establishing the materials elemental composition by the sensitive NAA technique and their nano-structures using microscopy scanning techniques, in analysing their behavior under temperature variation and water influence using physical and chemical methods. The project aims at performing a complex study on the correlation between the materials properties and their effectiveness in/or after use in a neutron field. The final experimental results rely on the most advanced evaluation schemes based on Inter - Laboratory Comparison experiments and use of statistical criteria and tools according to the ISO Standards in force. The team experts can disseminate their knowledge and experience to the young colleagues who prepare their doctoral studies, as well as to other interested people, by collaboration with ENEN and the Romanian Nuclear Training Center.

References (see also <http://www.nipne.ro/research/publications/publications.php?user=42>)

1. Em. Cincu, I. Manea, V. Manu, D. Barbos, O. Sima, I. Gustavsson, P. Vermaercke, N. Vajda, Z. Molnar, and H.P. Motrenko, *Comparative Performance of Nuclear INAA and other Spectroscopy Techniques in the Elemental Analysis of Stainless Steel Materials*, J. Radioanal. & Nucl. Chem. **274** (2007) 199-205.
2. Em. Cincu, I. Manea, D. Bărbos, I.L. Cazan, and V. Manu, *A possible tool for checking errors in the NAA results based on Neutron data and Method Validation*, AIP Conf. Proceedings **1036** (2008) 67-81.
3. Em. Cincu, L. Crăciun, I. Manea-Grigore, I. L. Cazan, V. Manu, D. Barbos, and A. Cociș, *Application of the INAA Technique for Elemental Analysis of Metallic Biomaterials*, Appl. Rad. Isot. **67** (2009) 2133–2136.

IFIN-HH FP7 RCNs: 84421, 83614, 83647, 83653 (http://cordis.europa.eu/fp7/partners_en.html)