

FOREWORD

The Institute's of Atomic Energy main topic is a safe energy generation with particular emphasis on nuclear energy as the most environment friendly technology. This has been expanded into the realm of hazards analysis and its applications to conventional plants. The ionising radiation protection issues furnish the basis of our health physics research. Material science studies performed mainly with non-destructive nuclear techniques like X-rays and neutron scattering or Mössbauer spectroscopy form an important part of our research.

The Institute of Atomic Energy is the operator of the multifunctional nuclear research reactor MARIA. In 2006 the reactor was successfully operated for 4004 hours with a new type of fuel elements of 36% enrichment in U-235. No radiological accidents, failures or breakdowns due to the fuel were recorded in 2006, confirming the good quality of the new fuel. The new fuel elements' integrity monitoring system was completed and the reactor heat exchangers as well as secondary cleaning system were upgraded.

One of our main goals is to provide the scientific community of Poland an easy access to source of neutrons. This involves widest possible applications of MARIA reactor in research and technology. The thermal neutrons are used in research for neutron scattering and radiography. The main applications of the MARIA in technology are: radioactive isotopes production, neutron doping of silicon and minerals properties modification. The Reactor Facility for Neutron Transmutation Doping of Silicon Single Crystals was awarded by the Polish Agency for Enterprise Development.

43 papers describing the results of our research were published in 2006. Some of the results were accounted for in 61 IAE Reports as the preliminary step before publication. Several new results obtained in 2005 on water self-diffusion in porous media, properties of modified with ion beams materials as well as extensive use of synchrotron topography in crystal defects studies should be mentioned. The recombination methods for assessment of mixed radiation doses at accelerator facilities were mastered.

The studies on models and software tools for emergency management were carried out within the EU Framework projects by the Centre of Excellence Management of Health and Environmental Hazards MANHAZ. The seven volumes monograph “Models and Techniques for Health and Environmental Hazard Assessment and Management” was published in 2006.

The Materials Testing Centre formed within a consortium of the IAE and the Radioactive Waste Management Plant for quick identification and categorisation of unidentified or of unknown origin radioactive or nuclear items forms an important link to the Polish response system to illicit trafficking and inadvertent movement of radioactive materials.

After Polish Government decision of 2005 on the use of nuclear power for electricity generation, the Institute in cooperation with few universities began preparation for training students in the nuclear safety and radiation protection. In this endeavour we found the European Union assistance in the form of Transition Facility. The Institute took part in elaboration of expertise reports as well as research and education programmes crucial for the preparation of implementation of nuclear power plants in Poland.

Our institute is open for the community. We are proud that about 4,500 visitors came to enjoy our presentations and lectures on nuclear techniques developed on the basis of nuclear research reactor MARIA in 2006.

At the end of 2006, after the decision of the Ministry of Economy to join the Institute of Atomic Energy and Centre of Isotope Production POLATOM, the Institute has been prepared for enlargement.



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