

## **FOREWORD**

*Institute of Atomic Energy was established in 1983 on the basis of dissolved Institute for Nuclear Research. The IAE main topic is 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. The second topic of research is material science studies performed mainly with non-destructive nuclear techniques like X-rays and neutron scattering or Mössbauer spectroscopy.*

*Institute of Atomic Energy is the operator of the multifunctional nuclear research reactor MARIA. In 2005 the reactor was successfully operated for 3850 hours with a new type of fuel elements of 36% enrichment in U-235. No radiological accidents, failures or breakdowns due to the new fuel were recorded in 2005, confirming the good quality of the new fuel. The new radiation monitoring system was completed at the reactor.*

*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.*

*45 papers describing the results of our research were published in 2005. Some of the results were accounted for in 60 IAE Reports as the preliminary step before publication. Several new results obtained in 2005 such as temperature spikes occurring during soil imbibition, and determination of stress distribution in implanted GaAs layers should be mentioned. The recombination methods for assessment of mixed radiation doses were mastered. The numerical methods developed by Prof. Z. Woźnicki found recognition with the award for the best paper at the IPSI-2005 conference.*

*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 experience of the Material Research Laboratory in radioactive materials analysis was employed in Materials Testing Centre formed within the consortium of the IAE and the Radioactive Waste Management Plant for quick identification and categorisation of the unidentified or of unknown origin radioactive or nuclear items. The Materials Test Centre has been one link of Polish system for the response to illicit trafficking and inadvertent movement of radioactive materials.*

*After Polish Government decision 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.*

*Our institute is open for the community. We are proud that about 4,000 visitors took part during 2005 in our presentations and lectures on nuclear techniques developed on the basis of nuclear research reactor MARIA.*

*The 50th anniversary of the establishing the National Nuclear Centre at Świerk as the Institute of Nuclear Research was celebrated officially on May 2005 and acknowledged by Polish President and State Ministry of Science and Polish Academy of Sciences. The Institute of Atomic Energy celebrated the event with special medal issued on this occasion and meetings, including the emeritus employees meeting.*

*Krzysztof Wieteska*