



# Strengthening radiation processing capabilities for industry and healthcare in Europe

## The challenge

Radiation technology plays a very important role in Europe's national economies. In countries where gamma irradiators or electron accelerators are widely used, for example in the sterilization of healthcare products and in polymer and tyre crosslinking, the application of the technology is well established. However, new standards and regulations regarding the radiation treatment of healthcare products, pharmaceuticals and food, and further developments in radiation processing are continuously being introduced. Even well-established applications therefore need new strategies and further development.

Radiation technology has matured over the years, and today, the industry is expected to be based on green, economical and advanced solutions, regulated by factors related to safety, quality and energy saving. Quality assurance/quality control (QA/QC) programmes implemented at radiation facilities have to be updated regularly and standardized throughout the region. The same is true for radiation sources, where the use of electron

accelerators needs expansion in the region. In addition, emerging opportunities for agro-products, environmental protection technologies and material engineering needed to be demonstrated to all Member States.

## The project

A regional IAEA technical cooperation project has focused on promoting and enhancing the application of advanced radiation technologies for radiation processing of human healthcare products, environmental remediation and the production of advanced materials in European Member States, using appropriate standardized quality control methods and procedures. Assistance was provided mainly in the form of knowledge sharing through training courses, meetings and workshops; in the elaboration of new guidelines, materials and protocols for QA/QC; and in the development and adoption of methodologies and standardized quality control methods and procedures. Guidance was provided for developing feasibility studies for the establishment of new facilities and radiation processing applications and procedures. The



The regional project on strengthening radiation processing capabilities for industry and healthcare in Europe focused on knowledge sharing, quality assurance and safety. (Photo: O.Ryabukhin/Ural Federal University)

project also garnered an overview of the current situation in the European region as regards operational gamma and electron irradiation facilities, the application of radiation processing technology, and QA/QC/ quality management system procedures.

### The impact

The project helped 21 European and Central Asian countries to improve their radiation processing capacity for the treatment of medical supplies, polymer modification and food safety. The project helped to promote radiation technology in individual countries and confirmed compliance with relevant standards. Training courses and site visits were used to enhance the participants' knowledge of laboratory-specific methods and procedures, and improved safety procedures and culture.

The project also facilitated the transfer of knowledge from countries with well-developed radiation processing capabilities to those with newly started programmes. Training courses and exchange of experience supported the implementation of more robust quality control standards, and included the safe operation of gamma and electron beam facilities, as well as the process validation and control of technologies according to IAEA standards. In addition, a dosimetry intercomparison exercise was performed to enhance quality control procedures in the participating countries. The project reinforced the importance of safety within radiation processing facilities, and emphasized the importance of harmonizing processes and of enhancing the scope of applications.

## PROJECT INFORMATION

**Project No:** RER1017

**Project title:** Using Advanced Radiation Technologies for Materials Processing

**Duration:** 2016-2017 (2 years)

**Budget:** €352 000

**Contributing to:**



### Partnerships and counterparts

Counterpart institutions from Croatia, Hungary, Poland, Portugal, Romania, Russian Federation, Serbia and Slovakia provided coordination support in the management and implementation of the project.

### The science

Radiation technologies have a wide variety of industrial applications, including the sterilization of medical products, production of advanced polymer materials, irradiation of food to eliminate insect pests and prevent spoilage, and the irradiation of industrial wastewater to protect the environment and to decrease water shortages.



The lead project coordinator from the Centre for Energy Research of the Hungarian Academy of Sciences provides instruction on gamma and electron beam irradiation and dosimetry during one of the project's training courses. (Photo: O.Ryabukhin/Ural Federal University)