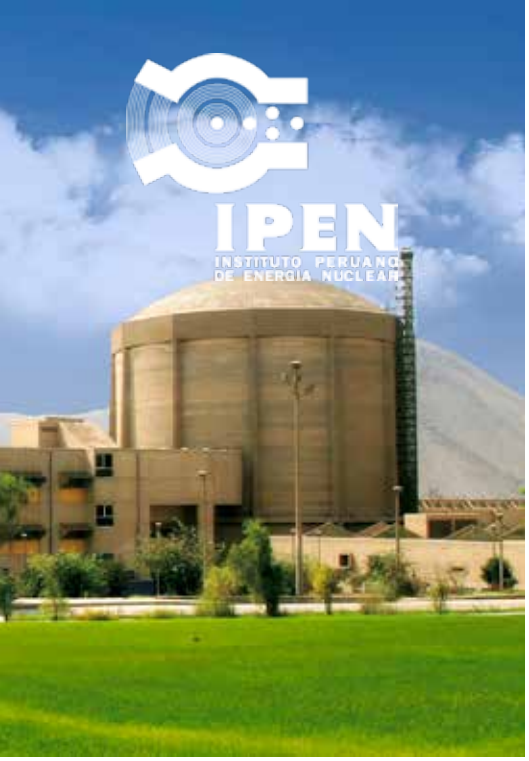

Strategic alliances with a future vision to take care of health needs of the population IPEN - UNI - IAEA

Ever since Wilhelm Roentgen discovered X-rays and later Henri Becquerel and Marie Curie discovered the existence of radioactive substances that emitted ionizing radiation, scientists have been studying their properties and possible applications. The discovery was fabulous, as it was the first time that X-rays made it possible to see what was inside the human body. Similarly, the use of radium-226, in multiple applications, increased. However, the medical applications were those that made the most use of this type of radiation for either diagnostic or therapeutic purposes. Many beneficial aspects were identified, but also the professionals who used these radiations more intensively began to show health effects.

Further research showed that just as ionizing radiation could have benefits, it could also have negative effects, requiring that practitioners using it should have a sound knowledge of its applications and risks. Medical applications led to the specialities of X-ray radiodiagnosis, nuclear medicine, and radiotherapy, which require the participation of highly qualified and competent multidisciplinary teams. One of the specialties required is Medical Physics, which is the branch of Physics that encompasses the study and development of its applications in the field of medical sciences, for the diagnosis and treatment of diseases. Considering the needs of the population and the proper and safe use of ionizing radiation, and in order to make up for the large deficit, or non-existence, of qualified medical physicists in the main hospitals in Peru, the Peruvian Institute of Nuclear Energy (IPEN) requested assistance from the International Atomic Energy Agency (IAEA), through the planning and implementation of a national project within the framework of the technical cooperation program.

The national project, entitled “Training in Medical Physics”, was approved under code PER0020 and started to be implemented in 1995, with the objective of establishing a Master of Science (MSc)’s program in Medical Physics in Peru. The technical counterpart of IPEN was Mr. Modesto Montoya Zavaleta, with counterparts at the IAEA in the Technical Officer, Mr. Heikki Tapani Toelli, and the Managing Program Officer, Mr. Bernd Radischat. Three national institutions collaborated in the establishment of this postgraduate program: the

Peruvian Institute of Nuclear Energy, the National University of Engineering and the National Institute of Neoplastic Diseases. The IAEA's important contribution consisted of experts and equipment. Seven expert missions advised on the didactic programming of the courses, gave lectures on medical physics, prepared teaching materials and carried out laboratory experiments on medical ultrasound, image processing and biosignal processing. The expert missions also provided advice on computer methods for dose calculation and quality procedures. In addition, the IAEA provided materials and equipment for the laboratory sessions.

The implementation of the project was very successful as it has made a substantial contribution to improving the number of adequately trained medical physicists in the country. For the public, the direct result has been the improvement of health care through improved imaging and dosimetry techniques in radiation oncology. It can be asserted that the implementation of this project marks a historic milestone in Peru, since over the years it has succeeded in training professionals, in many cases female medical physicists, who have managed to substantially improve the conditions of safety and quality assurance in the provision of medical diagnostic and therapeutic services.

Therefore, it can be seen that the institutions that joined forces, seeking synergies, having identified national needs in the area of health, really had a future vision, and it marks a milestone in the process of continuous improvement of health care for the population. It also provides qualified personnel in the speciality of Medical Physics, and its participation in programs such as the "National Comprehensive Cancer Care Plan (2020 - 2024)" in Peru, which seeks to contribute to reducing morbidity and mortality from cancer in Peru, through strategic actions with equity, and focused on health promotion, prevention, early diagnosis, treatment and palliative care of cancer, and likewise to be integrated into IAEA initiatives, called "Rays of Hope", which contributes to the fulfillment of the 2030 Agenda and Sustainable Development Goal 3 (health and well-being).