

NATIONAL PROGRAMME OF TRAINING IN MEDICAL PHYSICS (MEX/6/005) E3 a/ New

FOOTNOTE a/ FINANCING

YEAR	Experts		Equipment	Fellowships		Scientific Visits		Training	Sub-contracts	Misc. Comp.	Total
	m/d	US \$	US \$	m/d	US \$	m/d	US \$	US \$	US \$	US \$	US \$
1995	3/ 0	37,800	110,000	-	-	4/ 0	50,400	-	-	-	198,200
1996	3/ 0	39,600	174,000	-	-	2/ 0	26,400	-	-	-	240,000

First Year Approved: 95

OBJECTIVES: To complete the training of physicists already working at the radiology, radiotherapy and nuclear medicine services and to establish a training programme and facilities that will meet current and future needs through a curriculum leading to a Master's degree in medical physics.

BACKGROUND: The use of ionizing radiation in the medical field has increased significantly in Latin America. Accordingly, the need has arisen to increase the number of specialized physicists in areas such as radiotherapy, diagnostic radiology (imaging) and nuclear medicine. In Mexico there are 80 Co-60 radiotherapy units and 13 linear accelerators for the treatment of cancerous tumours. In addition there are 100 nuclear medicine centres and more than 20,000 diagnostic X-ray units. Personnel occupationally exposed in hospitals and patients treated with ionizing radiation require the services of specialist personnel who can ensure the correct application of therapeutic and diagnostic techniques under the strictest possible quality control, so as to reduce the dose to the population to the lowest practicable level. This is specially important since the greatest contribution to population dose comes from the use of ionizing radiation in medicine, particularly in diagnostic radiology, which frequently lacks proper control. In Mexico there are about ten professionals in medical physics who had a formal academic education in the field. In addition, approximately 20 professionals carry out their work on the basis of experience acquired in hospitals. The need for medical physicists is clear: there are only about 30 professional medical physicists for a population of about 90 million. The corresponding figure in developing countries would be 900, i.e. about one per 100,000 people. The requirement for 100-125 medical physicists in the next 10 years can be considered a very conservative estimate. New national regulations have been prepared, for enactment in 1994, that make compulsory the participation of trained medical physicists in the radiotherapy services. The National Institute for Nuclear Research (ININ) and the National Ministry of Health have agreed that ININ and the National Cancer Institute (INCAN), which is part of the Ministry of Health, intend to develop a suitable training programme to overcome the shortage of specialist personnel. With Agency assistance, a national programme has been prepared which takes into account the recommendations of the IAEA, the Master of Science course in medical physics of the American Association of Medical Physics, and other curriculae at various universities in the USA and Europe. Formal agreements have been reached between ININ and INCAN to jointly organize the courses and for the common use of the infrastructure of both institutions. On this basis, a four-module course was organized; the first module started in August 1994, given by Mexican lecturers with the assistance of Agency experts. The course is open to Mexican nationals and to foreigners from the region. Future instructors will be selected from the participants in the first course. The national programme will go forward as a

professional certification (diploma) programme, with Mexican and Latin American participants, until a formal Master's degree programme, in which ININ and INCAN will continue to collaborate, is fully operational.

PROJECT PLAN: The programme of the course has been organized in four modules: I. Principles of Medical Physics; II. Radiological Safety and Quality Assurance; III. Radiotherapy Treatment Planning; IV. Diagnostic Radiology and Nuclear Medicine. Each module will cover 9-10 weeks (360-400 teaching hours, including laboratory and clinical practice). Modules I and II will be given at ININ, Modules III and IV at INCAN. The schedule of courses for the next three years has been prepared in separate periods of 10 weeks taking into account that the first persons to be trained are precisely those who are currently working in the different areas of medical physics. Owing to the nature of their work, these people cannot be released full time from their duties for the whole instruction period, so that training will have to be carried out in a way that will not affect their work in the hospitals for long periods. The first course started in August 1994 with Agency assistance under project MEX/O/009, funded by the USA. In this course, special care will be taken to train and select the national specialists who will be future instructors. In 1995 and 1996 the teaching material and practical instruction will be revised (in 1995 for Modules I and II and in 1996 for Modules III and IV). At the same time, procedural measures will be developed for formal approval of the future Master's degree programme.

NATIONAL COMMITMENT: Staff, laboratories, teaching and hospital facilities and equipment at ININ and INCAN; operating costs.

AGENCY INPUT: Expert services in radiobiology, nuclear medicine, dosimetry for external beams and brachytherapy. Training in physics on the physiological functions, biological effects of radiation, imaging and internal dosimetry in nuclear medicine; X-ray diagnostic imaging, dosimetry treatment planning for external beams and brachytherapy; automatic and computerized phantom, Alderson phantom, software, quality control system for nuclear medicine, dose calibrator, ancillary laboratory equipment.

IMPACT: Training in nuclear medical technology will be instrumental in meeting standards, improving quality and satisfying safety requirements of the radiotherapy, radiology and nuclear medicine services in Mexico and in other countries of the region. The programme will allow 10-12 medical physicists per year to be trained. The first graduate class of 10 medical physicists is expected to be ready by mid-1996. Medical physicists from other Latin American countries will be trained in Mexico and the project is an excellent model for similar national programmes in Latin America.