PRODUCTION OF TC-99m GEL GENERATORS FOR NUCLEAR MEDICINE (EGY/2/008)

G5 New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US $	US $	US $	m/d	US $	m/d	US $	US $	US $	US $	US $
1997	1/12	18,480	0	50 000	3/0	9,450	0/7	2,240	0	0	0	90,170
1998	1/0	13,950	0	75 950	0/0	0	0/0	0	0	0	0	89,900
1999	1/7	18,130	0	80 000	0/0	0	0/0	0	0	0	0	98,130

First Year Approved 1997

OBJECTIVES: To prepare locally low-cost, high quality technetium generators based on the gel technology for nationwide supply to the nuclear medicine services.

BACKGROUND: The Agency has been assisting the Nuclear Research Centre (NCR), Inshas, since 1985 to develop capabilities for the production and quality control of radiopharmaceuticals. Important progress has been achieved in producing technetium-99m generators. Under previous projects, the production of Tc-99m generators using imported fission-molybdenum was initiated and today NRC is supplying several hospitals with this type of generator. Basic kits for labelling with Tc-99m for use as radiopharmaceuticals are being produced and tested clinically. However, to sustain this activity and to meet the ever increasing local demand, the Atomic Energy Authority would have to rely on imports of fission-molybdenum. The high cost of this product makes it difficult to ensure regular and reliable imports, which limits its use by the nuclear medicine services. Egypt imports about 500 fission-produced Tc-99m generators per year and it is anticipated that by the year 2000 the demand will increase by 35%. As an alternative, the NRC intends to use its two research reactors to prepare generators, using the gel technology, as is done in China. The project aims at strengthening indigenous efforts to meet the demands of nuclear medicine diagnostic services in Egypt by enabling NRC to produce pharmaceutical-quality Tc-99m generators based on inexpensive locally produced Mo-99. Towards this objective, the project activities will concentrate on setting up appropriate hot cell facilities and processing equipment to remotely produce Tc-99m column generators based on gel technology to cater initially for about 30% of the local market and gradually increase the percentage of coverage depending on market acceptance. Support from China will be sought, within the spirit of TCDC, with a view to accelerating transfer of the technology to Egypt.

PROJECT PLAN: The overall objective is to set up laboratory facilities for the routine production of gel Tc-99m generators for use nationwide in the nuclear medicine services. To this end, the first stage of the project will include activities towards upgrading the existing hot cells as well as installation, testing and commissioning of the in-cell processing equipment, with the co-operation of the Nuclear Power Institute of China. In parallel, local scientists and engineers will receive training in all aspects related to the gel generator technology. The second stage of the project will consist of laboratory trials, in co-operation with external experts, to optimize the quality of the gel generator, license its use by the relevant national authorities and start up routine production to meet at least 30% of the national demand.

NATIONAL COMMITMENT: The NRC has a 2 MW research reactor and will make available a second 22 MW(th) research reactor for neutron irradiation by the end of 1997. Three production hot cells are available and the facilities will be reconditioned to accommodate requirements. The necessary in-cell equipment for the gel technology, materials and facilities for radiation protection, and instruments for chemical and nuclear analysis will be provided. Eleven scientists and technicians will be assigned full time to the project.

AGENCY INPUT: Expert services to assist in the development of process and quality control of generators; hot cell components and equipment for in-cell technology and quality control; training.

PROJECT IMPACT: Development of a local capability for sustained production of gel generators will contribute in the long term to eliminating imports of expensive fission generators, thus making nuclear medicine services more reliable and accessible to a large segment of the population.