

PRODUCTION OF IODINE 123 VIA XENON TARGET (BRA/4/043) G5 a/ New

YEAR	Experts		Equipment		Fellowships				Training	Sub-contracts		Total		Grand total
	Months	CC \$	CC \$	NCC \$	Months	CC \$	Months	NCC \$	CC \$	CC \$	NCC \$	CC \$	NCC \$	
1993	1	11,400	80,000	-	-	-	-	-	-	-	-	71,400	-	71,400
1984	1	12,000	70,000	-	7	22,050	-	-	-	-	-	104,050	-	104,050

OBJECTIVES: To establish laboratory facilities for cyclotron production of iodine-123 utilizing a xenon target.

BACKGROUND: Since 1986, iodine-123 has been produced at the cyclotron laboratory in Rio de Janeiro of the Institute of Nuclear Engineering (IEN), of the National Nuclear Energy Commission (CNEN) using enriched tellurium-124 targets, a technology developed by the Nuclear Research Centre at Karlsruhe (KFK), Germany, and adapted to the local conditions. The iodine-123 produced with this technique has up to 3% iodine-124 impurity which precludes its use about 10 hours after irradiation or even 5 hours in the case of children, making it difficult to deliver to other cities or countries. Moreover, this type of production is limited to about 50 mCi per batch or 250 mCi weekly. KFK has continued to provide assistance to IEN and has now agreed to provide technical assistance in connection with the xenon target to construct the targets and components, assemble the target in Karlsruhe and install it in IEN. IEN has requested assistance from the Agency to finance the necessary arrangements with KFK to install and put into operation the xenon target.

NATIONAL INPUT: IEN/CNEN will provide the necessary counterpart staff, which will involve the employment of a mechanics technician, one electronic technician and two chemistry technicians. The equipment made available will include a hot cell, a leak detector, a radioisotope calibrator and an automatic teleburette. Funds will be provided to cover all local expenses. Appropriate radiological protection procedures will be maintained in accordance with support and advice received from IRD/CNEN.

AGENCY INPUT: The Agency has been requested to provide equipment to manufacture the components of the xenon target, experts to provide advice on the site and associated facilities, installation, testing and operation of the target, and iodine-123 production. Fellowships were requested for the participation and training involved in the assembly of the target and in radioisotope production.

LONG-TERM IMPACT: Iodine-123 will be produced with a high level of purity and in larger amounts than with the present system. This will result in significant benefits for patients, as the radiological doses will be significantly lower, a larger number of people will be treated throughout Brazil, and, eventually there will be a reduction in costs.