

Annual Report 2006 - 2007
Board of Radiation and Isotope Technology

Executive Summary

CH 4 Radiation Technologies & Applications

During 2006-2007, more than 52000 consignments of various isotope products and round the clock radiation processing services were provided to customers across the length and breadth of the country as well as some located abroad bringing in a sales turnover of Rs.4000 lakhs.

Healthcare

About 12290 consignments of ready to use radiopharmaceuticals of Iodine-131, Phosphorous-32, Chromium-51 and Samarium-153 were supplied to various Nuclear Medicine centers. Majority of these contained Iodine-131 radiopharmaceuticals, which amounted to about 542 Ci; and about 12000 consignments. 620 Ci of Mo-99 (TCM-2) was supplied for extraction of Tc-99m at hospitals. In addition to this various accessories of Tc-99m-Solvent extraction generator system and other products were supplied. 45230 Cold Kits for formulation of Tc-99m radiopharmaceuticals (Code-TCK; 12 products) were supplied to various Nuclear Medicine centers worth Rs. 2.5 crore.

Eight batches of Iodine-131 labeled monoclonal antibody, a GMP product, for clinical use under contract manufacturing for M/S. Peregrine Pharmaceuticals, USA were successfully carried out during the year 2006.

An agreement for technology transfer has been signed between BRIT and INMAS and DRDO for a new product " Kit for the preparation of 99m Tc- Ciprofloxacin injection also called 'DIAGNOBACT' . 99m Tc- Ciprofloxacin is an infection imaging agent and this kit is a single vial and in single dose formulation.

The Medical Cyclotron Facility at RMC supplied 18FDG to hospitals within Mumbai worth Rs. 4.50 Crores during the year.

Nuclear & Biotechnological Tools

Tritiated water injection has been undertaken for ONGC off shore oil wells (Neelam and Heera) for the first time and the job has been executed successfully in three oil wells. A total of 450 Ci of tritiated water was injected.

The commercial production and supply of ¹⁴C urea capsule has begun.

As part of the contract manufacturing job with M/S. Peregrine, USA, the quality control assay of the 131I-labeled antibody was carried out with respect to its protein and ion content. Totally eight batches were successfully analysed during the period. In addition to this, the presence of different ions in the cold antibody samples also was carried out.

BRIT has taken over the radioactive element detection services work in food products from the Environmental Assessment Division, BARC.

4.7.1. Radioisotope Sources.

During April-December 2006, sealed radiation sources of total activity of about 600 kCi were fabricated, processed and supplied for use in various types of industrial applications. 100 kCi cobalt 60 activity was loaded in SHRI, Vadodara. 670 kilo curies of cobalt 60 activity was transported from RAPPCOF, Kota to BRIT facilities at BARC between April 2006 and December 2006. Another 500 kCi is expected to be transported between January 2007 and March 2007.

Gamma Radiation Processing Services

ISOMED processed about 12200 cubic meters of different types of products were sterilized during the year. Expert services for plant commissioning dosimetry were extended by BRIT to M/s A V Processors, Ambarnath, M/S. Universal Medicap, Vadodara, M/S. Vardan, Sonapat, M/S. OGFL, Kolkata and M/S. Microtrol, Bangalore.

The radiation processing plant at Vashi processed more than 1500 MT of spices and allied products were processed during April to December 2006 earning a revenue of Rs. 77 lakhs. It is expected to earn a total revenue of Rs, 1.0 crore during revenue year 2006-2007.

Radiation Processing Plants in Private Sector

A new Gamma Irradiation Plant fully in private sector was commissioned in the year 2006 at Bangalore. Apart from supplying the ⁶⁰Co sources for the new plant, BRIT provided requisite technical guidance and facilitation services (from conception to commissioning stage) which enabled them to commission the plant in a time bound manner. During this year seven more private agencies have signed MoU with BRIT for setting up gamma irradiation plants in different parts of the country.

Customer Support Services Cell

During the year 2006-07, Customer Relationship Cell (CRC) continued serving customers and made it more convenient to customers to interact with the officials of BRIT and regulatory authorities in matters relating to procurement and use of radioisotope products and equipment. The retail outlet for supply of cold kits set up for the benefit of nuclear medicine user institutions in and around Mumbai continued serving customers bringing in a revenue of approximately Rs. 6 lakhs. The second retail outlet was inaugurated at JONAKI, Hyderabad in November 2006.

The transportation of about 52,000 consignments of radioisotope and allied products, majority of them by air, was carried out in a safe manner. Major transportation activities carried out during the year includes movement of kilocurie amounts of radioactive sources from RAPPCOF, Kota to Mumbai, Mumbai to Vadodara and Mumbai to Ambarnath, teletherapy sources from Mumbai to various cancer hospitals in the country and Gamma Chamber and Blood Irradiator units to various research centres and hospitals.

Radioisotopes and allied products supplied by BRIT

Sr.No	Item	Actual between April-December, 2006	Expected to be achieved April,2006 – March, 2007
1	Consignments	47640	≈ 52000
2	Activity	1075 kilo curies	≈ 1700 kilo curies
3	Sale Value	Rs. 2671lakhs	Rs. 4000 lakhs

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Descriptive Part

CH 4 Radiation Technologies & Applications

Board of Radiation & Isotope Technology (BRIT) continued its mandate towards progress by regular production and supply of a vast array of high quality radioisotope products which include sealed radiation sources of activity ranging from few microcuries to millions of curies mainly for medical and industrial use; radiation technology equipment such as Gamma Radiography Camera, Gamma Chamber units, Blood irradiators; Radiopharmaceuticals, Immunoassay kits, Radiochemicals, Labeled compounds, Labeled Biomolecules, ^{99m}Tc generators, 'cold' kits, oligo nucleotides, self-luminous compounds, etc. As a service provider, BRIT also operates plants for radiation sterilization of medical products (ISOMED) at South Site, BARC ; Radiation Processing Plant at BRIT Vashi Complex for radiation processing of spices and allied products and runs Co-60 handling facility (RAPPCOF) at RAPS, Kota, JONAKI Laboratory at Hyderabad and Regional Centres (RC) located at Bangalore, Delhi, Kolkata and Dibrugarh.

The various activities carried out by BRIT related to the production and supply of radioisotope and allied products and radiation technology equipment for use in Healthcare, Industry, Agriculture and Research during the period of this report are as follows:

4.5 Healthcare

4.5.1. Radiopharmaceuticals

About 13000 consignments of ready to use radiopharmaceuticals of Iodine-131, Phosphorous-32, Chromium-51 and Samarium-153 were supplied to various Nuclear Medicine centers. Majority of these contained Iodine-131 radiopharmaceuticals, which amounted to about 542 Ci; in about 12000 consignments. 620 Ci of Mo-99 (TCM-2) was supplied for extraction of Tc-99m at hospitals. In addition to this various accessories of Tc-99m-Solvent extraction generator system and other products were supplied. 45230 Cold Kits for formulation of Tc-99m radiopharmaceuticals (Code-TCK; 12 products) were supplied to various Nuclear Medicine centers worth Rs. 2.5 crore.

Clinical trials of the new therapeutic product [P-32] injection for the treatment of joint disorders is near completion and around 150 joint studies were carried out satisfactorily in seven Nuclear Medicine Centers. After obtaining the clearance of the Radiopharmaceuticals committee (RPC), the product can be launched in the first quarter of 2007.

Eight batches of iodine 131 labeled monoclonal antibody, a GMP product, for clinical use under contract manufacturing for M/S. Peregrine Pharmaceuticals, USA were successfully carried out during the year 2006.

An agreement for technology transfer has been signed between BRIT and INMAS for a new product “ Kit for the preparation of ^{99m}Tc - Ciprofloxacin injection also called 'DIAGNOBACT' . ^{99m}Tc - Ciprofloxacin is an infection imaging agent and this kit is a single vial and in single dose formulation.



^{99m}Tc Column Generator Production Facility (TcGPF)

The cold commissioning of TCGP Facility has been successfully achieved. Hot commissioning and trial runs commenced in February 06 with clearance from AERB to handle upto 74 GBq of ^{99}Mo . Five batches of 74 Gbq capacity each was processed and number of radiological data was generated and submitted to AERB. AERB has accorded permission to handle 370 GBq of ^{99}Mo activity. Production logistics was established and ten batches upto 370 GBq capacity was processed and supplied to local hospitals, regional centers of BRIT for evaluation. About 370 patient studies were successfully carried out till September 2006. Based on the feedback, initial product standardization has been completed.



Since November 18, 1006, trial production has started and 4 batches of Gel generator have already been successfully supplied as per schedule to RMC, Regional Centers of BRIT and also a few private hospitals on fortnightly basis.

4.5.2 Nuclear Medicine : Diagnostic & Treatment Service

More than 6200 kits of RIA and IRMA were supplied during the year to more than **300** immunoassay laboratories throughout the country.

Free T_4 kits (based on coated tubes) and HCG IRMA kits (based on magnetizable particles) were launched during the year.

The Regional centres located at Bangalore and Delhi processed ready-to-use ^{99m}Tc radiopharmaceuticals for use in the host medical centres apart from supplying the products to other hospitals in the region. RCR, Bangalore carried out 3750 investigations and supplied 4800 mCi of ready to use formulations. 3135 blood bags were irradiated for the prevention of T-GVHD in blood transfusion.

RC, Delhi produced 72500 mCi of ready-to-use ^{99m}Tc radiopharmaceuticals. Detailed QC protocols for ^{99m}Tc DMSA for tumor imaging were also carried out.

Apart from carrying out R & D work related to PET radiopharmaceuticals, the Radiopharmaceutical Lab of BRIT at VECC, Kolkata is actively involved in the setting up of the radiopharmaceutical production facility of the DAE Medical Cyclotron Project.

BRIT provided RIA and IRMA services for the benefit of more than 9000 patients of the North-Eastern states through its Regional Centre at Dibrugarh. The samples originated from patients admitted to civil hospitals, institutional hospitals like those of ONGC, OIL, Defense, Tea Garden, Air Force and also the District Jail hospital. For the first time, PSA kit by IRMA method and Testosterone was introduced as a routine test in the North Eastern region. The regional centre is actively involved in the setting up of a RIA unit at Shillong, Meghalaya.

The Medical Cyclotron facility at Radiation Medicine Centre, Parel Mumbai supplied ^{18}F FDG worth Rs. 4.50 crores to five major hospitals in Mumbai.

4.3.2 Nuclear & Biotechnological Tools

4.3.2.1 Labeled Compounds

Labeled Compounds Laboratory (LCL) group continued the synthesis and supply of a variety of ^{14}C , ^3H and ^{35}S labeled products, oligonucleotides, tritium filled self luminous sources, tritium-titanium suspension and nucleic acid labeling kits. R & D activities were carried out as before for standardizing and adapting new methods, increasing yield and also for enhancing quality.

The major achievements during the year are as follows:

Tritiated water injection has been undertaken for ONGC off shore oil wells (Neelam and Heera) for the first time and the job has been executed successfully in three oil wells. A total of 450 Ci of tritiated water worth Rs. 81 lakhs was injected.

The commercial production and supply of ^{14}C urea capsule has begun.

As part of the contract manufacturing job with M/S. Peregrine, USA, the quality control assay of the ^{131}I -labeled antibody was carried out with respect to its protein and ion content. Totally seven batches were successfully analysed during the period. In addition to this, the presence of different ions in the cold antibody samples also was carried out.

The custom synthesis of two ^{35}S labeled compounds (^{35}S thiourea and ^{35}S thioglycolic acid) was carried out successfully and the supply of these products against a standing order was initiated.

A variety of standard sequencing primers were introduced in the product list. HPLC purified oligonucleotides supply started after the successful standardization of the procedure for purification.

Procedures were standardized for the preparation of labeled compounds like ^{14}C -labeled phenylglycine, microwave induced synthesis of [carboxyl- ^{14}C] labeled nicotinic acid (Vitamin B3) and [carboxyl ^{14}C] nicotinamide using K^{14}CN etc.,

4.3.2.2 JONAKI Laboratory at CCMB Campus, Hyderabad

Jonaki laboratory at Hyderabad supplied more than 1950 consignments of 1200mCi of P-32 and 20 mCi of P-33 labelled nucleotides to 35 research institutes. Enzyme Taq DNA polymerase required for PCR amplification was introduced during this year along with allied kits.

A new product, PCR amplification based diagnostic kit for mycobacterium tuberculosis has been developed, standardized and is currently on trial.

A retail outlet for supply of cold kits used by Nuclear medicine practitioner was opened at the Jonaki Regional Centre in November 2006.

Food Analysis Laboratory

BRIT has taken over radioactive element detection services work in food products from the Environmental Assessment Division, BARC. This will initially be undertaken from the existing laboratory at the BARC Hospital and later extended to Navi Mumbai also.

Quality Control Programme

Quality control testing and analysis was carried out on all ready to use radiopharmaceuticals, generator based products, RIA/IRMA kits, inactive raw materials and active raw materials. Up-gradation of the facilities was constantly done by installation of the latest state-of-the-art equipment wherever possible and also by preparing up-to-date monographs for all products being tested.

4.5.3. Nuclear Medicine: Cancer diagnostic & treatment services

14 teletherapy sources had already been supplied upto December 2006 and 2 more sources are ready to be supplied to Cancer Hospitals in India fetching Rs. 3.8 Crore by March 2007. 14 units of ¹⁹²Ir-Pt wire is expected to be prepared and supplied to various hospitals and medical research centres for the treatment of cancer.

Industrial Applications:

4.7.1. Radioisotope Sources.

During April-December 2006, sealed radiation sources of total activity of about 600 kCi were fabricated, processed and supplied for use in various types of industrial applications. Following is the list of customers to whom cobalt-60 sources are supplied during 2006-07

300 kCi for SHRI, Vadodara
200 kCi for Universal Medicap Ltd., Vadodara
100 kCi for Rashmi, Bangalore
100 kCi for OGFL, Kolkata

200 kCi for AV Processors Ltd., Ambarnath
200 kCi for Microtrol, Bangalore
260 kCi for KRUSAK, Lasalgaon

Cobalt-60 sources were made for 4 Blood Irradiators, 1 Gamma Chamber 5000 and 1 Gamma Chamber 1200.

670 kilo curies of raw cobalt 60 activity was transported from RAPPCOF, Kota to BRIT facilities at BARC between April 2006 and December 2006. Another 500 kCi is expected to be transported between January 2007 and March 2007.

4.7.2. Gamma Radiation Processing Services (GRPS)

4.7.2.1. Radiation Sterilization Plant for Medical Products (ISOMED)

ISOMED continued to offer prompt and efficient gamma sterilization services to large numbers of customers spread all over the country. About 12200 cubic meters of different types of products were sterilized during the year. The plant availability factor and plant utilization factors were maintained well above 85% and 80% percent respectively through meticulous planning of operation and regular servicing/maintenance schedule of the facility by a team of experienced and dedicated staff members. The revenue generated in the calendar year is over Rs. 5.5 crores.

Radiation stability testing of materials and equipments was carried out at ISOMED for various DAE units such as NPCIL, BARC, ECIL etc. to assess their suitability for use in various nuclear installations.

Ceric-cerous sulphate dosimeters for routine dosimetry and dose mapping studies and biological indicators using *Bacillus pumilus* spores for microbiological monitoring were produced at ISOMED. These products were also supplied to other irradiation facilities in the country. ISOMED provided the manpower training to those organizations who are in the process of setting up new radiation processing facilities in the country.

Local Safety Committee meetings were held periodically to discuss, review and improve the radiation and operational safety status of the plant.

Expert services for plant commissioning dosimetry were extended by BRIT to M/s A V Processors, Ambarnath, M/S. Universal Medicap, Vadodara, M/S. Vardan, Sonapat, M/S. OGFL, Kolkata and M/S. Microtrol, Bangalore.

4.7.2.2. Radiation Processing Plant, Vashi (RPP, Vashi)

The plant continued offering its radiation processing services to all its customers from all over the country. More than 1500 MT of spices and allied products were processed during April to December 2006 earning a revenue of Rs. 77 lakhs. It is expected to earn a total revenue of more than Rs. 1.0 crore during revenue year 2006-2007.

Operation and Maintenance of KRUSHAK Irradiator has been taken over by BRIT in January 2007. This will be deployed for the quarantine treatment of mangoes meant for exports to the US.

4.7.2.3. Radiation Processing Plants in Private Sector



Chairman AEC Dr. Anil Kakodkar after inaugurating the Microtrol Radiation Processing Plant

Considerable progress has been achieved in the setting up of Radiation Processing Plants in Private Sector. A new Gamma Irradiation Plant was commissioned in the period at Bangalore. Apart from supplying the ⁶⁰Co sources for the new plant, BRIT provided requisite technical guidance and facilitation services (from conception to commissioning stage) which enabled them to commission the plant in a time bound manner.

During this year seven more private agencies listed below have signed MOU with BRIT for setting up gamma irradiation plants in different parts of the country.

- 1 M/s Meridian Shipping Pvt. Ltd. - Mundra port in Gujarat for food and medical products
2. M/s ILA Agro & Surgitech Pvt. Ltd.: Delhi - Khatawali, Dist. Rewari in Haryana for food products, medical/health care products, gems, etc,
- 3 M/s Meridian Shipping Pvt Ltd - Jawaharlal Nehru Port Trust (JNPT), Nhava Sheva in Navi Mumbai for agro & agro based products including fruits (mangoes), vegetables, spices & other items
4. M/s Impartial Testing, U.P. - Unnao in UP for medical/food products,
5. M/s Innova Agri Bio Park Ltd - Malur Taluk, Kolar Dist., near Bangalore, Karnataka for irradiation of Agri food products, spices, "etc.
6. M/s Syndicate Bio Irradiators India Pvt. Ltd. - Mahaboob Nagar Dist in Andhra Pradesh for medical & agri food products, spices.
7. The Khammam Dist., Co-op, Mktg Soc. Ltd. - Khammam Dist, Andhra Pradesh for setting up a radiation processing facility for large scale irradiation of food & agro products-

4.7.2.4. Accelerators

All the components like chains, tracks, carts etc., of Towline conveyor meant for the 10 MeV Electron Beam Accelerator facility at Khargar, Navi Mumbai have been installed In August 2006. The ILU-6 EB accelerator at BRIT continued to provide R & D services to academic and scientific institutions.

4.7.3. Radiation Technology Equipment

4.7.3.1. Gamma Chamber GC 5000:

During the current year, 1 GC 5000 was supplied to the Central Glass and Ceramic Research Institute, Kolkata. 1 GC-1200 was supplied to Tamilnadu Agriculture University, Coimbatore. 3 Low dose Irradiator LDI-2000 was supplied to Radiation Biology and Health Science, BARC, Low level Radiation Research Lab, Quilon and Jain centre for Advance Scientific Research, Bangalore. Purchase orders have already been received for supply of GC-5000 from IAEA for supply to Costarica and NEAD centre, Hanoi, Veitnam.

4.7.3.3. Radiography Camera ROLI-1

BRIT supplied 53 nos. of ROLI-1 radiography exposure devices in 2006 as against 23 nos. supplied in 2005. This is the highest ever number supplied by BRIT in its history. BRIT also supplied 789 replacement sources during the year.

BRIT has developed a portable radiography exposure device with maximum capacity of holding 20 Ci iridium 192 source. A prototype of this was exhibited at the NDE-2006 exhibition and elicited good interest from the radiographers.

4.7.3.4. Blood Irradiator

The programme of production & supply of Blood Irradiator BI 2000 has been pursued further. During the year, 2 nos. of new Blood Irradiator units were fabricated, source loaded and tested for installation and commissioning in hospitals and research institutions. 1 BI-2000 was supplied to ACTREC, Khargar, Navi Mumbai.

4.7.3.5. Install & Operate Irradiator

The civil work including the construction of the building is to begin shortly. Work on the electro-mechanical as well as control systems are in progress.

4.7.3. 6 QA of Sealed Sources, Radiometry Scanning and Irradiation Services

Interpretation of large numbers of radiographs of welds of GC 5000, BI 2000 and BLC flasks were carried out.

Approximately 200 numbers of ROLI 1 cameras were tested at the REPF workshop and the Radiological lab of BARC. Density measurements were carried out on cobalt-59 pellets and slugs and also chemical analysis and XRF analysis were carried out for the acceptance of the material for irradiation.

4.14. Supporting Services

4.14.1. Customer Support Services Cell (CSSC)

As the nodal agency for sales and supply, marketing and customer relations, Co-ordination & logistics support were continued to be provided for the regular and uninterrupted supply of radioisotopes & allied products and radiation technology equipment to about 2000 user institutions in the healthcare, industrial, research and agricultural sector.

During the year 2006-07, Customer Relationship Cell (CRC) continued serving customers and made it more convenient to customers to interact with the officials of BRIT and regulatory authorities in matters relating to procurement and use of radioisotope products and equipment. The retail outlet for supply of cold kits set up for the benefit of nuclear medicine user institutions in and around Mumbai continued serving customers bringing in a revenue of approximately Rs. 6 lakhs.



Project House at Anushaktinagar where CSSC is located

The second retail outlet was inaugurated at JONAKI, Hyderabad in November 2006.

The transportation of about 52,000 consignments of radioisotope and allied products, majority of them by air, was carried out in a safe manner. Major transportation activities carried out during the year includes movement of kilocurie amounts of radioactive sources from RAPPCOF, Kota to Mumbai, Mumbai to Vadodara and Mumbai to Ambarnath, teletherapy sources from Mumbai to various cancer hospitals in the country and Gamma Chamber and Blood Irradiator units to various research centres and hospitals.

Radioisotopes and allied products supplied by BRIT

Sr.No	Item	Actual between April-December, 2006	Expected to be achieved April,2006 – March, 2007
1	Consignments	47640	≈ 52000
2	Activity	1075 kilo curies	≈ 1700 kilo curies
3	Sale Value	Rs. 2671lakhs	Rs. 4000 lakhs

Awareness Programme at Mangalore and SNM 2006, Jamshedpur



School children of Mangalore avidly participating in the BRIT exhibition

An awareness programme was held at Town hall, Mangalore jointly with the Mangalore university and the National Association for Applications of Radioisotopes and Radiation in Industry (NAARRI) on the applications of radiation and radioisotopes during 29-30 November 2006. An exhibition was also organized by BRIT, NPCIL & DAE on this occasion. A large number of participants benefited from this program.

BRIT also participated in the Society for Nuclear Medicine Conference held at Tata Main Hospital, Jamshedpur and had put up a stall in the exhibition too.

This event gave a huge opportunity for BRIT participants to interact with the customers and to give a preview of the new products BRIT is about to launch.

4.14.2.Engineering Support Services

Services group provided the vital infrastructural and utility services to BRIT and BARC facilities at Vashi Complex. Provision of uninterrupted electrical power, air conditioning and ventilation services on continuous basis to the radioactive laboratories, civil and public health services and communication services in Vashi complex are the major challenges faced. Quality service provided by the Services group have enabled the production units to meet the production and supply schedules as planned.

IX Plan Projects of BRIT

1. Augmentation of Cobalt handling Facility at RAPP COF (ACHF), Kota

The project is complete and financially closed. Initial safety review by PSRC, AERB has been completed.

2. Design, Development of Radiation Equipment and Test Facility (DDRE&TF)

The project is completed. The ten ton capacity for Type B(U) packages at ARAI, Pune is being regularly used by different units of DAE.

X Plan Projects of BRIT

1. Integrated Facility for Radiation Technology (IFRT)

The progress of the project is as follows :

- Scope of the Project has been enhanced to include the fabrication of Sealed sources also.
- Design basis reports for civil, electrical, ventilation and crane have been submitted to different working groups of preliminary safety review committee of AERB.
- Preliminary Safety Review Committee of AERB after reviewing the comments of different working groups has recommended for the starting of civil construction.
- Modifications as per the recommendations of PSRC, AERB experts and users have been incorporated in various sub-systems, civil designs etc., and final drawings and specifications are prepared.
- Revised estimate have been prepared by DCSEM for civil. Electrical, ventilation and crane. Additional amount of Rs. 509 lakhs would be required towards the major works. Concurrence from the IFA has been obtained.
- Tendering process for civil construction is in final stage.

2. Revamping & Augmentation of Infrastructural Facilities (RAIF)

- Construction of QA/QC laboratory in REPF building is completed.
- Civil construction work of accounts and administration building is in the final stages of completion.
- Fabrication of transport flask, for 5 Curie cobalt-60 is completed and supplied.
- Purchase order for multichannel analyzer is placed.
- Liquid handling system for RIA coated tube worth Rs. 100 lakhs has been supplied and installation is in progress.
- Automatic system for dispensing of iodine-131 is installed.

3. DAE Medical Cyclotron at Kolkata – Processing Facility for Cyclotron produced Radioisotopes and Radiopharmaceuticals

Order is placed for medical cyclotron along with radioisotope production and processing facility and L/C is opened for advance payment.

Architectural design of the building is in the final stages of completion.

The pre-bid meeting with contractors and finalization of vendor for civil works is expected to be completed before March 2007.

The following 11 plan projects have been proposed:

1. Facility for the DAE Medical Cyclotron project for enabling production of radiopharmaceutical from SPECT & PET isotopes.
2. Integrated Irradiator development project to upgrade safety and security features in RPP, Vashi and ISOMED, Trombay and to establish a irradiator facility.
3. Project for setting up a new automated facility for production of ^{99m}Tc column generator using a high specific activity ^{99}Mo .
4. Construction of State-of-art Immunoassay facility for the development of coated-tube
5. Construction of State-of-art GLP & GMP compliant Laboratory for synthesis of Labeled Compounds.
6. Project for establishing complete process and facility for fabrication of HDR Brachytherapy equipment.