

DEPARTMENT OF ATOMIC ENERGY**DEMAND NO. 5****Atomic Energy**

A. The Budget allocations, net of recoveries, are given below:

		<i>(In crores of Rupees)</i>								
Major Head	Budget 2003-2004			Revised 2003-2004			Budget 2004-2005			
	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	
Revenue	180.50	660.42	840.92	180.07	792.01	972.08	231.10	960.79	1191.89	
Capital	619.50	409.09	1028.59	544.93	300.46	845.39	1023.28	289.21	1312.49	
Total	800.00	1069.51	1869.51	725.00	1092.47	1817.47	1254.38	1250.00	2504.38	
1. Secretariat-Economic Services	3451	...	11.59	11.59	...	11.50	11.50	...	12.20	12.20
	5401	2.00	...	2.00	2.11	...	2.11	0.85	...	0.85
<i>Total</i>		<i>2.00</i>	<i>11.59</i>	<i>13.59</i>	<i>2.11</i>	<i>11.50</i>	<i>13.61</i>	<i>0.85</i>	<i>12.20</i>	<i>13.05</i>
Atomic Energy Research and Industries										
2. Bhabha Atomic Research Centre										
2.01 Research & Development	3401	...	354.04	354.04	...	350.62	350.62	...	368.00	368.00
<i>Total</i>			<i>354.04</i>	<i>354.04</i>		<i>350.62</i>	<i>350.62</i>		<i>368.00</i>	<i>368.00</i>
2.02 Industrial Projects	2852	...	144.96	144.96	...	138.38	138.38	...	145.80	145.80
2.03 Capital Projects	4861	140.00	...	140.00	131.00	...	131.00	190.00	...	190.00
	5401	140.00	...	140.00	100.00	...	100.00	250.00	...	250.00
<i>Total</i>		<i>280.00</i>	<i>...</i>	<i>280.00</i>	<i>231.00</i>	<i>...</i>	<i>231.00</i>	<i>440.00</i>	<i>...</i>	<i>440.00</i>
Total - BARC		280.00	499.00	779.00	231.00	489.00	720.00	440.00	513.80	953.80
3. Indira Gandhi Centre for Atomic Research, Kalpakkam										
3.01 Operation of Fast Breeder Test Reactor & Other Facilities	3401	...	82.50	82.50	...	83.90	83.90	...	89.60	89.60
3.02 Capital Projects (I&M)	4861	20.00	...	20.00	8.00	...	8.00	20.00	...	20.00
3.03 Capital Projects (R&D)	5401	35.00	...	35.00	33.00	...	33.00	54.00	...	54.00
Total - IGCAR		55.00	82.50	137.50	41.00	83.90	124.90	74.00	89.60	163.60
4. Centre for Advanced Technology, Indore	3401	...	30.40	30.40	...	32.65	32.65	...	34.60	34.60
	4861	0.24	...	0.24	0.24	...	0.24	...	...	...
	5401	50.00	...	50.00	55.09	...	55.09	66.00	...	66.00
Total - CAT		50.24	30.40	80.64	55.33	32.65	87.98	66.00	34.60	100.60
5. Variable Energy Cyclotron Centre, Kolkata.	3401	...	18.30	18.30	...	20.02	20.02	...	21.10	21.10
	5401	23.00	...	23.00	25.00	...	25.00	54.48	...	54.48
<i>Total</i>		<i>23.00</i>	<i>18.30</i>	<i>41.30</i>	<i>25.00</i>	<i>20.02</i>	<i>45.02</i>	<i>54.48</i>	<i>21.10</i>	<i>75.58</i>
6. Directorate of Purchase & Stores, Mumbai	3401	...	10.00	10.00	...	12.52	12.52	...	12.71	12.71
7. Directorate of Construction, Services and Estate Management, Mumbai	3401	3.00	51.98	54.98	3.00	45.70	48.70	8.30	49.90	58.20
8. General Services Organisation, Kalpakkam	3401	...	18.95	18.95	...	24.00	24.00	...	25.85	25.85
9. Tata Institute of Fundamental Research, Mumbai	3401	35.00	71.75	106.75	40.00	75.80	115.80	51.00	79.50	130.50
10. Tata Memorial Centre, Mumbai	3401	35.40	63.70	99.10	25.85	60.50	86.35	37.00	65.75	102.75
11. Saha Institute of Nuclear Physics, Kolkata	3401	18.00	17.25	35.25	23.00	18.30	41.30	27.50	19.25	46.75
12. Grant to other Institutions.										
12.01 Institute of Physics, Bhubneswar	3401	3.10	7.00	10.10	3.10	7.30	10.40	4.00	8.15	12.15
12.02 Harish-Chandra Research Institute Allahabad	3401	2.50	6.80	9.30	1.75	6.70	8.45	2.90	7.35	10.25
12.03 Institute of Mathematical Sciences, Chennai	3401	2.50	7.33	9.83	3.10	7.70	10.80	1.10	8.40	9.50
12.04 Institute for Plasma Research, Gandhinagar	3401	28.00	26.00	54.00	28.00	17.00	45.00	42.00	27.00	69.00
12.05 Grants to Other Institutions	3401	47.00	...	47.00	47.27	...	47.27	51.30	...	51.30
<i>Total</i>		<i>83.10</i>	<i>47.13</i>	<i>130.23</i>	<i>83.22</i>	<i>38.70</i>	<i>121.92</i>	<i>101.30</i>	<i>50.90</i>	<i>152.20</i>

		(In crores of Rupees)								
Major Head	Budget , 2003-2004			Revised, 2003-2004			Budget, 2004-2005			
	Plan	Non-Plan	Total	Plan	Non-Plan	Total	Plan	Non-Plan	Total	
13. Housing Projects	5401	22.00	...	22.00	24.55	...	24.55	35.54	...	35.54
14. Atomic Minerals Directorate for Exploration and Research, Hyderabad	3401	...	48.25	48.25	...	49.08	49.08	...	50.85	50.85
	4861	9.42	...	9.42	9.42	...	9.42	11.40	...	11.40
	5401	15.00	...	15.00	10.00	...	10.00	15.00	...	15.00
	<i>Total</i>	<i>24.42</i>	<i>48.25</i>	<i>72.67</i>	<i>19.42</i>	<i>49.08</i>	<i>68.50</i>	<i>26.40</i>	<i>50.85</i>	<i>77.25</i>
Nuclear Fuel										
15. Nuclear Fuel Complex, Hyderabad										
15.01 Fuel Fabrication Facilities:										
Gross	2852	...	381.75	381.75	...	428.96	428.96	...	456.61	456.61
Less-Receipts	0852	...	-766.00	-766.00	...	-671.24	-671.24	...	-601.05	-601.05
<i>Net</i>		...	<i>-384.25</i>	<i>-384.25</i>	...	<i>-242.28</i>	<i>-242.28</i>	...	<i>-144.44</i>	<i>-144.44</i>
15.02 Common Services	2852	...	4.16	4.16	...	12.66	12.66	...	13.90	13.90
15.03 Steel Tubes Plant	2852	...	15.95	15.95	...	12.69	12.69	...	13.49	13.49
15.04 Capital Projects of NFC	4861	22.00	...	22.00	20.00	...	20.00	64.00	...	64.00
Total-Nuclear Fuel Complex										
Heavy Water		22.00	-364.14	-342.14	20.00	-216.93	-196.93	64.00	-117.05	-53.05
16. Heavy Water Projects										
16.01 Maintenance of Housing Colonies for Heavy Water Plants	2852	...	5.58	5.58	...	5.58	5.58	...	8.00	8.00
16.02 Other HeavyWater Plants.	4861	15.34	5.58	20.92	15.34	6.34	21.68	23.00	6.68	29.68
Total-Heavy Water Projects		15.34	11.16	26.50	15.34	11.92	27.26	23.00	14.68	37.68
17. Heavy Water Production										
17.01 Heavy Water Plant, Baroda	4861	...	50.84	50.84	...	27.76	27.76	...	43.87	43.87
17.02 Heavy Water Plant, Kota	4861	...	92.97	92.97	...	87.12	87.12	...	93.35	93.35
17.03 Heavy Water Plant, Tuticorin	4861	...	53.98	53.98	...	53.37	53.37	...	55.50	55.50
17.04 Heavy Water Plant, Talcher	4861	...	7.58	7.58	...	6.40	6.40	...	7.59	7.59
17.05 Heavy Water Plant, Thal	4861	...	76.98	76.98	...	67.43	67.43	...	70.38	70.38
17.06 Heavy Water Plant, Hazira	4861	...	94.13	94.13	...	94.29	94.29	...	96.18	96.18
17.07 Heavy Water Plant, Manuguru	4861	...	138.47	138.47	...	124.48	124.48	...	133.49	133.49
	<i>Total</i>	...	<i>514.95</i>	<i>514.95</i>	...	<i>460.85</i>	<i>460.85</i>	...	<i>500.36</i>	<i>500.36</i>
Less- Loss of Heavy Water	4861	...	-111.69	-111.69	...	-166.98	-166.98	...	-217.83	-217.83
<i>Net</i>		...	<i>403.26</i>	<i>403.26</i>	...	<i>293.87</i>	<i>293.87</i>	...	<i>282.53</i>	<i>282.53</i>
Total - Heavy Water		15.34	414.42	429.76	15.34	305.79	321.13	23.00	297.21	320.21
18. Board for Radiation and Isotope Technology, Mumbai	2852	...	27.80	27.80	...	24.70	24.70	...	25.70	25.70
	4861	8.00	...	8.00	5.56	...	5.56	17.06	...	17.06
	<i>Total</i>	<i>8.00</i>	<i>27.80</i>	<i>35.80</i>	<i>5.56</i>	<i>24.70</i>	<i>30.26</i>	<i>17.06</i>	<i>25.70</i>	<i>42.76</i>
	2852	...	5.77	5.77	...	2.27	2.27	...	2.28	2.28
19. Other Programmes	3401	1.00	14.61	15.61	1.00	14.72	15.72	1.00	15.85	16.85
	4861	21.00	0.25	21.25	16.07	0.25	16.32	41.34	...	41.34
	5401	1.50	...	1.50	2.15	...	2.15	1.61	...	1.61
	<i>Total</i>	<i>23.50</i>	<i>20.63</i>	<i>44.13</i>	<i>19.22</i>	<i>17.24</i>	<i>36.46</i>	<i>43.95</i>	<i>18.13</i>	<i>62.08</i>
20. Grants-in-aid to Electronics Corporation of India Limited	2852	4.00	...	4.00	4.00	...	4.00	5.00	...	5.00
21. Implementation of VRS										
i. Electronics Corporation of India Ltd.	2852	1.00	...	1.00	...	...	...	...	...	...
22. Investments in Public Enterprises										
i. Electronics Corporation of India Ltd.	4859	5.00	...	5.00	7.00	...	7.00	9.00	...	9.00
	6859	...	...	...	...	...	...	...	...	...
	<i>Total</i>	<i>5.00</i>	<i>...</i>	<i>5.00</i>	<i>7.00</i>	<i>...</i>	<i>7.00</i>	<i>9.00</i>	<i>...</i>	<i>9.00</i>
ii. Uranium Corporation of India Ltd.	4861	80.00	...	80.00	80.00	...	80.00	160.00	...	160.00
iii. Indian Rare Earths Ltd.	4861	10.00	...	10.00	0.40	...	0.40	10.00	...	10.00
Total-Investment in Public Enterprises	<i>Total</i>	<i>95.00</i>	<i>...</i>	<i>95.00</i>	<i>87.40</i>	<i>...</i>	<i>87.40</i>	<i>179.00</i>	<i>...</i>	<i>179.00</i>
Total-Atomic Energy Research and Industries		798.00	1057.92	1855.92	722.89	1080.97	1803.86	1253.53	1237.80	2491.33
Grand Total		800.00	1069.51	1869.51	725.00	1092.47	1817.47	1254.38	1250.00	2504.38

		(In crores of Rupees)								
Head of Dev.	Budget, 2003-2004			Revised, 2003-2004			Budget, 2004-2005			
	Budget Support	IEBR	Total	Budget Support	IEBR	Total	Budget Support	IEBR	Total	
B. Investment in Public Enterprises										
1. Electronics Corporation of India Ltd.	12859	5.00	15.00	20.00	7.00	15.00	22.00	9.00	25.00	34.00
2. Uranium Corporation of India Ltd.	12861	80.00	60.00	140.00	80.00	60.00	140.00	160.00	94.00	254.00
3. Indian Rare Earths Ltd	12861	10.00	61.10	71.10	0.40	22.86	23.26	10.00	52.74	62.74
Total		95.00	136.10	231.10	87.40	97.86	185.26	179.00	171.74	350.74
C. Plan Outlay										
1. Telecommunication and Electronics Industries	12859	5.00	15.00	20.00	7.00	15.00	22.00	9.00	25.00	34.00
2. Atomic Energy Industries	12861	331.00	121.10	452.10	290.03	82.86	372.89	541.80	146.74	688.54
3. Atomic Energy Research	13401	464.00	...	464.00	427.97	...	427.97	703.58	...	703.58
Total		800.00	136.10	936.10	725.00	97.86	822.86	1254.38	171.74	1426.12

1. **Secretariat – Economic Services** - DAE Secretariat is the apex body administering the constituent units, PSUs and aided institutions spread all over the country. In the Department of Atomic Energy, there are five R&D Units, three industrial units and four PSUs apart from eight aided institutions. It has also a Branch Secretariat at New Delhi.

2. **Bhabha Atomic Research Centre (BARC), Mumbai** - BARC a multi-disciplinary organisation, pursues comprehensive research and development programmes for harnessing nuclear energy and its application for advancement of the society. These efforts are concentrated in the fields of nuclear sciences, engineering & technology, basic sciences and allied fields. The activities are geared for exploitation of atomic energy for power generation and development of radiation technology and its application in the areas of agriculture, medicine, industry and research. For fulfilling the mandate, interaction with academic institutions and international co-operation in related advanced areas of research are being strengthened. BARC continues to provide required support to ensure national safety.

Several new projects/programmes have been taken up in X Plan, which would focus on R&D issues, related to :

- Power generation through AHWR route utilising vast indigenous resources of thorium.
- Development of accelerator driven sub-critical systems (ADSS) for generation of electricity and breeding of fissile material.
- Accelerate the utilisation of radio isotopes and radiation technology (based on both nuclear reactor and accelerators) in the field of agriculture, industry & health care.
- Improving capacity utilisation, ageing management and excellence in safety performance of nuclear power reactors.
- Frontier areas of research in physics, chemical & bio-sciences.
- Power generation through fast breeder reactors and bringing the front & back ends of the fast reactor fuel cycle from lab scale to industrial scale.
- Human resource development.
- Enhanced collaboration with academic and research institutions.

3. **Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam** - IGCAR a multi-disciplinary Research & Development Unit established in 1971, with the focused mission of indigenous design and development of liquid sodium cooled Fast Breeder Reactor (FBR) in our country to meet the growing demand for electricity.

An experimental sodium cooled Fast Breeder Test Reactor (FBTR) has been in operation at IGCAR since 1985 with indigenously developed plutonium-uranium carbide fuel. The research reactor, Kalpakkam MINI (KAMINI), using Uranium-233 as fuel has been operating at its nominal power of 30 kW and is being used for neutron radiography and also for activation analysis.

4. **Centre for Advanced Technology (CAT), Indore** - CAT was established in 1987. During the past two Plan periods, the Centre has established excellent infrastructure including workshops and R&D laboratories for carrying out research and development in accelerators and lasers.

Department of Atomic Energy has entered into a major collaboration with European Council for Nuclear Research (CERN) for contributing to LHC, the world's largest Accelerator under construction. CAT is coordinating this collaboration and has developed some of the items namely super conducting sextupole and decapole corrector magnets, precision magnet positioning jacks, software etc.

The main thrust of the laser programme is to develop technologies of important lasers and explore their applications in industry, medicine as well as R&D.

5. **Variable Energy Cyclotron Centre (VECC), Kolkata** - VECC has been operating the nation's largest and the first indigenously built cyclotron providing charged particle beams of various energies. VECC has developed expertise on accelerator technology and its applications. One of the significant developments is electron cyclotron resonance source (ECR), the latest state-of-the-art heavy ion source, which has been coupled to the cyclotron recently for accelerating heavy ion beams of 115 MeV Oxygen and 150 MeV of Neon etc. Using these heavy ion sources, the cyclotron is now ready for the second phase of experiments.

Two major R&D accelerator projects in the high tech areas namely, the construction of K500 superconducting cyclotron and Radioactive Ion Beam Facility have been undertaken.

In tune with Department of Atomic Energy's program for extending the benefits of nuclear medicine facilities, VECC has set up a Regional Radiation Medicine Centre (RRMC) at Kolkata for the benefits of the economically backward community from the eastern part of India.

6. **Directorate of Purchase & Stores (DPS), Mumbai** - The objective of DPS is to ensure availability of quality material at right time and at right place. DPS is carrying out the functions of Material Management relating to the Department of Atomic Energy. Over the years, DPS has identified a large number of suppliers

for developmental nature of jobs and in the process, helped the nation to attain self-sufficiency.

7. Directorate of Construction, Services & Estate Management (DCS&EM), Mumbai - DCSEM looks after the construction activities of the departmental units and aided institutions including housing for the employees.

8. General Services Organisation (GSO), Kalpakkam – GSO is entrusted with the responsibility of township maintenance (civil and electrical), maintenance of transport fleet of heavy and light vehicles, providing medical facilities under CHSS, maintenance of water supplies etc.

Aided Institutions

9. Tata Institute of Fundamental Research (TIFR), Mumbai - TIFR is primarily an Institute for basic research, but in this process it also develops new technologies and creates a pool of scientific and technical manpower. The research activities of the Institute are organized under three Schools : (1) School of Mathematics, (2) School of Natural Sciences and (3) School of Technology and Computer Science. TIFR has also been conferred the status of Deemed University by the University Grant Commission.

The School of Natural Sciences has seven departments at Mumbai (Theoretical Physics, Astronomy & Astrophysics, High Energy Physics, Nuclear and Atomic Physics, Condensed Matter Physics & Material Science, Chemical Sciences and Biological Sciences) and three national Centres: (a) The National Centre for Radio Astrophysics (NCRA) at Khodad (near Pune) (b) National Centre for Biological Sciences at Bangalore and (c) Homi Bhabha Centre for Science Education at Mankhurd, Mumbai. The School has also set up several field stations for various research facilities at Hyderabad, Ootacamund, Pachmarhi (MP) and Gauribidnur (Karnataka).

10. Tata Memorial Centre (TMC), Mumbai –TMC comprises Tata Memorial Hospital (TMH) and Advanced Centre for Treatment, Research, and Education in Cancer (ACTREC). TMH was established in 1941 by Sir Dorabji Tata Trust for the treatment and cure of cancer and allied diseases.

To facilitate rapid development and expansion of the facilities for the diagnosis, treatment and research in cancer and other allied diseases with the help of radioactive isotope and radioactive substances, the administrative control of TMH and Indian Cancer Research Centre was transferred from the Ministry of Health to the Dept. of Atomic Energy. TMH is a speciality hospital for services, education & research in cancer. It has the responsibility to set standards of therapy for treatment modalities and a Centre to train doctors, scientists and para-medical staff in the field.

Cancer Research Institute (CRI) established in 1952, is one of the units of Tata Memorial Centre and conducts basic, community-based and clinically oriented research on multiple facets of cancer, focusing on the cancers prevalent in India.

11. Saha Institute Of Nuclear Physics (SINP), Kolkata - SINP was established with dual objective of teaching including training for higher research and conducting research in various aspects on nuclear and bio-physical sciences. In addition to pursuing nuclear physics activities, the Institute is presently engaged in research in diverse fields from string theory to protein structure, from Clover detectors to muon Arm Project in ALICE at CERN, from high temperature superconductivity to high intensity magnetic field, from Tokamak plasma to Quark Gluon Plasma, from surface physics to astrophysics and from biology to cosmology.

12. Grants to other Institutions

12.01 Institute of Physics (IOP), Bhubaneshwar - IOP is engaged in research and development activities in the frontier

areas of physics and allied sciences. The theoretical research at the Institute covers the areas of high energy physics, quantum computing and mathematical physics, nuclear physics, condensed matter physics, bio-physics, astrophysics etc.

The Institute is actively involved in the International collaborative research programmes at CERN (Switzerland), BNL (USA), LNL (Italy) and other laboratories abroad. Under the STAR collaboration, the Institute contributed in the fabrication, testing and commissioning of the Photon Multiplicity Detectors, which have been installed at the Relativistic Heavy Ion Collider at BNL, USA.

The Institute promotes interactions with the universities, academic institutions and other research laboratories.

12.02 Harish-chandra Research Institute (HRI), Allahabad- Its main objective is to conduct fundamental research in various fields of Pure Mathematics, Theoretical Physics and allied topics.

12.03 Institute of Mathematical Sciences (IMSC), Chennai- IMSC established in 1962 is a National Institute of higher learning whose primary objective is to foster high quality fundamental research in frontier disciplines of Mathematical Sciences. The Institute has dynamic programme for pursuing research in three disciplines: Theoretical Physics, Mathematics and Theoretical Computer Science.

12.04 Institute for Plasma Research (IPR), Gandhinagar - The Institute has a broad charter of objectives to carry out experimental and theoretical research in plasma sciences with emphasis on the physics of magnetically confined plasmas and certain aspects of non-linear phenomena. The Institute also has a mandate to stimulate plasma research and developmental activities in the universities and the industrial sector. It also contributes in the training of plasma physicists and technologists in the country.

12.05 Grants to other Institutions - The research-education linkage has been always nurtured by DAE. Funding from the DAE to universities/institutions/ national laboratories is channeled through the Board of Research in Nuclear Sciences (BRNS). National Board for Higher Mathematics (NBHM) has initiated several schemes like helping the development of mathematical centres, giving scholarships to research fellows, travel assistance to young mathematicians for attending conferences/seminars, support to libraries etc. The Department also funds cancer hospitals in the country which support primarily small projects and radiation related equipment for cancer treatment.

To nurture nuclear technology, the endeavour of the Department covers training programme for its scientists/ engineers, programme under the inter-university consortium for utilisation of DAE research facility, enrichment of higher science education through intervention of its experts with university system, and training facilities/fellowships extended to countries through IAEA or under the bilateral agreements.

With the objective to deliver the technologies developed in the DAE laboratories to the people around the nuclear establishments, the Department has initiated the Neighborhood Welfare Programme. Welfare activities such as eye camps, health check-ups, renovation of primary schools, providing educational facilities, distribution of high yield seeds and emerging plant visits are carried out by the atomic power stations at different sites.

13. Housing Projects – The provisions include Housing Schemes for construction of houses for the staff and infrastructural facilities of the Department of Atomic Energy at Mumbai, Kalpakkam, Indore, Kolkata, Hyderabad etc. Provisions are also made for constructions of Housing projects for Aided Institutions like, TIFR, TMC, SINP, etc.

14. Atomic Minerals Directorate for Exploration & Research (AMD), Hyderabad - AMD carries out survey, prospecting and exploration of atomic minerals required for the nuclear power programme of the country. The activities include assessment, analysis, evaluation, characterisation and categorisation of atomic minerals, design and fabrication of radiometric instruments and development of ore extraction flow sheets with the aid of state-of-the-art equipment.

15. Nuclear Fuel Complex (NFC), Hyderabad - NFC is responsible for manufacturing alloy clad, natural and enriched Uranium Oxide Fuel Assemblies for all the Pressurised Heavy Water Reactors (PHWRs) and the Boiling Water Reactors (BWRs) respectively. It also manufactures Zirconium Alloy structural components for these reactors including Calandria and Pressure Tubes for PHWRs and Square Channels for BWRs. In addition, NFC produces Seamless Stainless Steel and Special Alloy Tubes of international standards for Nuclear and Non-Nuclear applications and Special and High Purity Materials for strategic use.

16 and 17. Heavy Water Projects/Production - Heavy Water Board (HWB) was set up in the year 1989 to manage the operation of the Heavy Water Plants (HWP) of the Department as also to look after the production activities of Heavy Water Plant, Nangal of National Fertiliser Limited (NFL). However consequent upon the decision of the Government to disinvest NFL, the HWP, Nangal has been closed down.

HWB is operating six Heavy Water Plants located at Baroda, Tuticorin, Kota, Manuguru, Thal and Hazira with a total designed/re-rated capacity of 500MT per year. While the four Heavy Water Plants operating at Baroda, Tuticorin, Kota & Manuguru are run departmentally, Heavy Water Plants at Thal and Hazira are operated and maintained by M/s. RCF & M/s. KRIBHCO respectively. HWP(Talcher) is being preserved alongwith some diversified activities such as Pilot Plant scale D2EHPA production & setting up of TBP Plant for meeting the requirement of NRG, BARC. The Boron Enrichment Pilot Plant Facility has been shifted from BARC to Talcher as part of diversification.

The flue gas conditioning technology developed by Heavy Water Board and transferred to M/s Chemithon Engineers Ltd. is being put to commercial use. HWB is continuing its programme of energy conservation which is a major thrust area in all its operating Plants in order to reduce further specific energy consumption per Kg. of heavy water produced, which would lead to reduction of production cost.

The cost of finished product (heavy water) is arrived at by adding the non-cash items, e.g. depreciation, interest etc. on the operational expenditure and other inputs of heavy water plants. The provision under Feed Stock Material is equivalent to the cost of production plus the cost of any direct procurement of heavy water.

18. Board for Radiation and Isotope Technology (BRIT), Mumbai - BRIT is responsible for production and supply of radioisotope products, radiation technology equipment and rendering radiation processing services for medical products, spices, etc. The four major areas of applications of radiation technology in which BRIT is actively involved are healthcare, industry, agriculture and supporting research in life sciences and bio sciences.

Radiopharmaceutical products and Radio Immuno Assay Kits are being supplied to all nuclear medicine and RIA Centres

throughout the country. In addition, BRIT supplies teletherapy sources for treatment of cancer patients. BRIT also supplies kilocurie ⁶⁰Co sources for use in gamma irradiation plants. BRIT products such as ROLI-1 Radiography Camera, Gamma Chamber, Research Irradiator and Blood Irradiator were supplied to various customer institutions.

Many private entrepreneurs have evinced interest in setting up gamma radiation processing facilities for various end purposes and BRIT is collaborating with them and providing facilitation services. BRIT has been regularly imparting training to scientists from various countries under IAEA fellowship in the field of radiopharmaceuticals, radiation processing, radiation sources etc.

19. Other Programmes

Under this head the provisions are made for the following:

- (a) **Management Services Group (MSG)** - MSG provides information services and computer systems support at the DAE Sectt.
- (b) **Thorium Plant** - While the Trombay thorium plant has been closed down, extraction of thorium is carried out at OSCOM plant by IREL on behalf of the Department. The provision is made to meet the operational expenditure of the plant.
- (c) **Atomic Energy Regulatory Board (AERB), Mumbai** - enforces radiological safety stipulations and is assisted by Safety Review Committee for Operating Plants (SARCOP), Safety Review Committee (SRC) for applications for radiation and other committees in carrying out its mandate in prescribing radiological, nuclear and industrial safety regulations.
- (d) **International Atomic Energy Agency (IAEA)** - India has been a member of the Board of Governors of the International Atomic Energy Agency (IAEA) since its inception, making available the services of the departmental scientists for expert assignments besides participation in international symposia and other fellowship exchange programmes. The provision under IAEA takes care of the contribution made by the Department to the international body.
- (e) **DAE Projects** - The Department undertakes a few projects which are jointly executed by the Constituent Units and by the PSUs on behalf of the Department.

20. Grant-in-aid to Electronics Corporation of India Limited (ECIL), Hyderabad. - The provision is made for R&D support to ECIL.

21. Implementation of VRS in ECIL - The provision approved in BE is withdrawn in RE 2003-04. There is no provisions made in BE 2004-05.

22. Investment in Public Enterprises

- (i). **Electronics Corporation of India Ltd. (ECIL), Hyderabad** - The provision is made for investment in equity.
- (ii). **Uranium Corporation of India Ltd. (UCIL), Jaduguda** - The provision included is for investment in equity against the Plan Schemes.
- (iii). **Indian Rare Earths Ltd. (IREL), Mumbai** - The provision is for investment in equity.