AUDIT REPORT

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REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

FOR THE YEAR ENDED MARCH 1997
NO. 5 OF 1998

UNION GOVERNMENT (SCIENTIFIC DEPARTMENTS)

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PREFACE

This Report for the year ended 31 March 1997 has been prepared for submission to the President under Article 151(1) of the Constitution. It covers matters arising from test-audit of the transactions of the Scientific Departments of the Union Government, the autonomous bodies funded by these Departments and some major scientific organisations associated with other Departments.

The Report includes 15 paragraphs and 8 reviews. The topics of reviews are

(i) Manpower Audit of Council of Scientific and Industrial Research
(ii) Regional Research Laboratory, Bhubaneswar
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The draft paragraphs and reviews were forwarded to the concerned Ministries/Departments/Councils for their comments. They did not, however, furnish their replies in respect of four paragraphs and three reviews.

The cases mentioned in this Report are among those, which came to notice in the course of audit conducted during 1996-97 and early part of 1997-98. For the sake of completeness, matters relating to earlier years which could not be covered in the previous Reports have also been included, wherever pertinent. Similarly, results of audit of transactions subsequent to 1996-97 have also been mentioned wherever relevant.

OVERVIEW

Financial Management

R&D expenditure of the major Scientific Departments and agencies of Government of India during 1996-97 was Rs.4696 crore, of which, Defence Research and Development Organisation (Rs.1436 crore), Department of Space (Rs.1065 crore), Indian Council of Agricultural Research (Rs.589 crore), Department of Atomic Energy (Rs.520 crore), Department of Scientific and Industrial Research (Rs.457 crore) and Department of Science and Technology (Rs.352 crore) accounted for Rs.4419 crore.

There was an overall saving of Rs.236 crore (other than DRDO) against the budget allotment of the Scientific Departments/Institutions. This constituted about four *per cent* of their total allotment. Some of the major Ministries/Departments where substantial savings occurred were Non-Conventional Energy Sources (Rs.87 crore), Environment and Forests (Rs.33 crore), Electronics (Rs.22 crore),Geological Survey of India (Rs.21 crore) and Atomic Energy (Rs.19 crore).

6585 utilisation certificates with aggregate value of Rs.532 crore against grants-in-aid provided by the Scientific Departments were awaited from the grantee institutions. Of these, 4587 utilisation certificates valued at Rs.340 crore were awaited for more than three years. This did not include the utilisation certificates awaited in Ministry of Non-Conventional Energy Sources prior to 1994-95, where the records were stated to have been destroyed in fire. Action Taken Notes on 8 paragraphs were outstanding in disregard of general instructions issued by *Lok Sabha* Secretariat and the Ministry of Finance.

Some of the important results of audit of the Scientific Departments and agencies (except DRDO) are set out in this overview.

(Paragraph 1)

Council of Scientific and Industrial Research

Manpower Audit

Despite its five decades of existence, Council of Scientific and Industrial Research (CSIR) had not been able to evolve a mechanism for assessing the requirement of different categories of manpower at its headquarters and laboratories or to lay down broad parameters for relative ratio of scientific to non-scientific manpower. CSIR also did not have any Management Information System in this regard and as such it could not exercise effective control over the manpower management of the laboratories. As a result, 14 laboratories operated 122 scientific and 500 technical posts over and above the sanctioned

strength fixed for them, without being questioned by CSIR headquarters. The laboratories also resorted to engaging contract and casual workers for different types of work of regular nature without approval and, at times, against the instructions of the CSIR. At Indian Institute of Petroleum, as per their own assessment, about 30 *per cent* of the persons employed through a contractor were close relatives of the laboratory's employees. The directive of the Government issued in February 1992 for 10 *per cent* reduction in all the categories of the posts was belatedly effected by CSIR in September 1995 and, that too, only in respect of scientific and technical personnel, leaving the administrative posts untouched. In six laboratories, 49 scientists and 155 technicians were given non-R&D assignments. At CSIR headquarters itself, 83 scientists and 222 technicians were deployed on non-R&D work. Central Drug Research Institute (CDRI) appointed 37 personnel on regular basis for two sponsored schemes though they should have been appointed temporarily. As a result, the liability to regularise them devolved on CDRI, which was yet to recover Rs.84.71 lakh from the sponsor. 310 temporary employees rendered surplus due to closure of two production units were adjusted arbitrarily in other laboratories without looking into the question of availability of post or suitability of the individual employees to the concerned laboratories. The sanctioned strength of Central Building Research Institute was augmented to accommodate the employees of Structural Engineering Research Centre (SERC) who were not willing to shift to Ghaziabad on its relocation and additional hands were recruited at SERC, Ghaziabad to meet the shortage of manpower.

The promotion schemes devised to provide time-bound *in situ* promotions to scientists engaged in R&D work were gradually extended to cover technical and engineering cadres as well. In the six laboratories and CSIR headquarters test-checked in Audit, all 1667 promotions to scientific and technical staff during 1992-97 were given retrospectively - period ranging upto five years and more. To enable even the non-technical personnel the benefits of faster promotions and higher retirement age under these promotion schemes, CSIR evolved schemes for their induction in the technical grades. In 53 out of 74 cases pertaining to the six laboratories, the incumbents did not possess even the minimum qualification and experience prescribed for direct recruitment to such posts and in many cases they continued to perform non-technical functions. For overcoming the constraint of non-availability of vacancies in the technical cadres, the persons considered for induction were allowed to carry their respective posts in technical grades. Masters degrees in the subjects like economics, geography, commerce etc. were treated equivalent to M.Sc. degree to facilitate promotion to holders of such qualification to scientists cadre. Certain non-technical posts were classified as technical posts to accord them the benefit of promotion schemes meant for S&T staff. To provide the administrative cadres promotion avenues comparable to those available to scientific and technical staff, CSIR resorted to frequent cadre reviews which resulted in creation of 278 additional posts and up-gradation of 1740 posts in different grades between 1987 and

1994 without the approval of Ministry of Finance. Ignoring repeated directives of the Government, CSIR granted higher pay scale to four categories of administrative staff, numbering 1959.

During 1992-97, in six laboratories test-checked, 271 scientists did not contribute any research paper, 88 contributed only one research paper each and 91 contributed two research papers each.

(Paragraph 2.1)

Regional Research Laboratory, Bhubaneswar

The Research Council was deficient in the matter of advising RRL on formulation of research programmes, conducting periodic reviews of research activities and assessing progress of projects during 1992-97. Project-wise data were not maintained by the planning, monitoring and evaluation cell of the Laboratory.

Premature closure of three in-house projects rendered the expenditure of Rs.1.62 crore unproductive. Three other projects, though completed, failed to achieve the stated objectives, rendering the expenditure of Rs.74 lakh infructuous as there were no takers of the research outcome of these projects. Objectives set out for two grants-in-aid projects costing Rs.11.78 lakh, could not be achieved, rendering the expenditure unproductive. The extent of usefulness and utilisation of the findings to the end users were also not available in respect of all the 17 grants-in-aid projects costing Rs.1.60 crore completed during 1992-97. No technology/know-how was developed during 1992-97, though 131 scientists and 144 technicians were working in the laboratory. Out of 35 technologies developed upto 1991-92, only 19 were released to the industry. All the seven patents obtained during 1992-97 were in respect of pre-1988 research activities. Purchase of equipment worth Rs.14.28 lakh, after completion of a project, rendered the expenditure wasteful. No physical verification of stores was conducted after 1986-87. Stores worth Rs.5.16 crore were not accounted for in stock ledgers. Non-investment of surplus funds resulted in loss of interest of Rs.51.94 lakh. Advances totalling Rs.3.90 crore were outstanding for more than a year.

(Paragraph 2.2)

Industrial Toxicology Research Centre, Lucknow

The Research and Development (R&D) activities at Industrial Toxicology Research Centre (ITRC) were at low ebb. ITRC failed to take up any new in-house project during 1992-97. The direction of the Research Council for terminating the existing 33 projects and initiating R&D in new areas was circumvented by ITRC by merely re-shaping and merging them into six projects. ITRC did not prepare project completion report in any of 28 in-house projects that were completed during 1992-94. Despite having full complement of staff, the planning, monitoring and evaluation cell of ITRC did not carry out

any project documentation. Out of 150 contract projects undertaken during 1992-97, 113 projects were completed. Out of the completed project files requisitioned for scrutiny by Audit, only 35 files were produced by ITRC. Scrutiny of four contract project files showed that ITRC failed to carry out/complete the projects in time and achieve the intended objectives. ITRC was able to develop just one technology which too was different from the four sought to be developed during the Eighth Plan. The number of the research papers contributed by ITRC scientists declined from 97 in 1992-93 to 43 in 1996-97. 31 *per cent* of the research papers were published in journals having no impact factor.

(Paragraph 2.3)

Loss due to defective agreement

Failure on the part of National Institute of Oceanography to include a clause in the agreement with the Shipping Corporation of India to the effect that operating/laid up expenses would not be payable by the Institute in the event of the ship going out of use, enabled the latter to appropriate Rs.163.67 lakh from the insurance claim of research vessel 'Gaveshani' belonging to the Institute.

(Paragraph 2.4)

Avoidable expenditure

An equipment and its accessories costing Rs.17.04 lakh, procured by the National Metallurgical Laboratory for a sponsored project arrived in the laboratory between February 1992 and July 1993 after completion of the project in June 1991. Though the equipment was commissioned belatedly in January 1997, the laboratory had not been able to make use of the same as yet.

(Paragraph 2.6)

Department of Atomic Energy

Nuclear Fuel Complex, Hyderabad

Nuclear Fuel Complex was established in 1970 to indigenously manufacture and supply fuel bundles, zircaloy components, calandria and coolant tubes for Pressurised Heavy Water Reactors and Boiling Water Reactors for meeting the requirements of the nuclear power programme of the Department of Atomic Energy. Rs.93.12 crore invested on expansion, augmentation and modernisation programmes failed to deliver the intended results both in quantitative and qualitative terms. The quality of production of uranium oxide pellets was poor and there were heavy rejections each year. This resulted in under-utilisation of Ceramic Fuel Fabrication Plant where the production of fuel bundles could never exceed 61 *per cent* of the installed capacity. Even the targets set for the production were much below the installed capacity. The setback in Ceramic Fuel Fabrication Plant (CFFP) not only restricted the

production in Zircaloy Fabrication Plant (ZFP), but also resulted in accumulation of over nine lakh zircaloy fuel tubes, sufficient for another three and a half years. Rs.190 crore were spent on setting up three new plants to augment the production of fuel bundles. Faulty project planning resulted in completion of the New Uranium Fuel Assembly Plant, where the fuel bundles were to be assembled, without the completion of the New Uranium Oxide Fuel Plant, where the pellets, an input for fuel bundles, were to be produced. This rendered an expenditure of Rs.40.79 crore on the New Uranium Fuel Assembly Plant idle. Both the forward and backward linkages for the New Zircaloy Fabrication Plant for production of fuel tubes were missing; whereas the Zirconium Sponge Project to produce zirconium ingots for this plant had not been taken up as of December 1997, there was no demand for the fuel tubes as even the existing Zircaloy Fabrication Plant was being under-utilised. Thus, the expenditure of Rs.69.51 crore on this plant, which had been completed, was also idle. Another investment of Rs.8.29 crore on Zirconium Sponge and Titanium Sponge Project, to be implemented as a joint venture, remained unfruitful as joint sector partner had not been identified and the technology for this project was yet to be established. Preparation of proforma accounts was in arrears since 1993-94.

(Paragraph 3.1)

Loss resulting from non-recovery of dues

Heavy Water Plant (HWP), Baroda executed an agreement in July 1973 with Gujarat State Fertilizer Company (GSFC) to use ammonia synthesis gas produced by GSFC for production of heavy water. To compensate GSFC for the loss of the synthesis gas, the agreement provided for reimbursement of the cost of production of one tonne of synthesis gas per day by HWP to GSFC. In disregard to the provisions of the agreement, GSFC recovered the cost of production of six tonnes of the synthesis gas per day from HWP, retrospectively from 1975, and appropriated Rs.11.90 crore upto March 1997, from the dues payable to HWP. Pursuant to the Audit observation, DAE took up the matter with the Ministry of Chemicals and Fertilizers. The latter clarified that GSFC was not entitled to the increased compensation. DAE had not yet recovered the amount.

(Paragraph 3.2)

Infructuous expenditure

Indira Gandhi Centre for Atomic Research placed an order on Bharat Heavy Electricals Limited in January 1994 for supply, erection and commissioning of Variable Speed Drive System, at a cost of Rs.3.26 crore and made an advance payment of Rs.30.14 lakh to BHEL. The Drive was required for testing Prototype Fast Breeder Reactor for which design parameters were not finalised by that time. Subsequently, the design of the reactor was changed, necessitating cancellation of the order in October

1994. This not only rendered the advance payment of Rs.30.14 lakh infructuous but also attracted an additional claim of Rs.34.16 lakh from BHEL in the form of accrued liability.

(Paragraph 3.5)

Department of Electronics

Research and development projects having import substitution as a component

Of the five councils, three councils of the Department did not undertake any project, having import substitution as a component, during the Eighth Plan. The other councils had completed 31 projects at a cost of Rs.873.34 lakh, where import substitution was one of the stated objectives. Out of these, action for transfer of technology was not initiated by the Department in 17 cases valued at Rs 374.75 lakh. Only five projects generated technology for commercialisation. The impact of these import substitution projects, which in normal course would have led to multiplier effect on value of production and savings in foreign exchange, was insignificant.

(Paragraph 5.1)

Department of Space

Overpayment due to change in notation of currency

Liquid Propulsion Systems Centre, Valiamala opened a letter of credit in Pound Sterling 200709 instead of US Dollar 200709 in June 1995. The mistake in notation of currency, at the time of opening the letter of credit, led to an overpayment of Rs.34.91 lakh to the foreign firm. Even though the mistake came to the notice in August 1995, the Centre failed to initiate action against the firm for more than two years. The overpayment was yet to be recovered.

(Paragraph 6.2)

Department of Science and Technology

Excess payment of Customs duty

India Meteorological Department placed an order on a foreign firm in February 1994 for supply of '25 Alden Model 9315 TRT- 128' compact facsimile recorders. Customs duty was assessed at rates higher than the prescribed rate. Failure of the Department to verify correctness of rates resulted in excess payment of Customs duty of Rs.16.95 lakh.

(Paragraph 7.1)

Indian Council of Agricultural Research

Inventory management in Institutes of Indian Council of Agricultural Research

The system of procurement and management of inventory in 11 Institutes of Indian Council of Agricultural Research (ICAR), test checked in Audit, was found to be deficient. There was unplanned procurement of equipment worth Rs.1.11 crore, as these remained idle for periods ranging from 6 months to 12 years. Cases of delay upto 36 months were seen in the installation of equipment with an aggregate value of Rs.6.99 crore. Purchases worth Rs.1.30 crore were made without inviting open tenders and equipment worth Rs.55.40 lakh were purchased after closure of the projects for which these were procured.

(Paragraph 8.1)

Unfruitful expenditure on import of defective equipment

Central Institute of Freshwater Aquaculture, Bhubaneswar imported an equipment costing Rs.13.98 lakh in July 1994 for monitoring the quality of ingredients and end product feed in a feed mill as also for analysing the samples on large scale commercial feed production after the feed mill was established. The equipment had not been installed as of October 1997 although the feed mill for which the equipment was purchased in 1994, was set up in February 1997. This resulted in the expenditure of Rs.13.98 lakh remaining unfruitful.

(Paragraph 8.2)

Unadjusted advances

Advance payments aggregating Rs.12.73 crore made by 10 laboratories test checked out of 89 laboratories of Indian Council of Agricultural Research, to their own officials, private parties and government departments remained unadjusted for varying lengths of time. Of this, a sum of Rs.11.13 crore was pending recovery/adjustment for over two years.

(Paragraph 8.4)

Ministry of Environment and Forests

Indian Council of Forestry Research and Education, Dehradun

Indian Council of Forestry Research and Education (ICFRE), an autonomous body established in June 1991, is under the Ministry of Environment and Forests. During the years 1992-93, 1994-95 and 1995-96, ICFRE incurred excess expenditure against the budget provision by diverting Rs.21.25 crore received

from the Ministry for implementation of externally aided projects. Accounts were audited by the same auditors who compiled their accounts. Due to problems such as non-availability of space, requisite power supply etc. equipment worth Rs.8.41 crore, purchased during 1993-96 for externally aided projects, could not be installed.

ICFRE procured 126 consignments of equipment on cost, insurance and freight basis, instead of free on board, which resulted in outflow of foreign exchange equivalent to Rs.55.51 lakh. ICFRE failed to invest the marginal money of letters of credit in term deposits and suffered a loss of interest of Rs.21.20 lakh. Out of the total publications worth Rs.36.07 lakh, publications valuing Rs.29.69 lakh were lying unsold in store as of December 1997.

(Paragraph 9.1)

Ministry of Non-Conventional Energy Sources

Solar Energy Centre, Gurgaon

The Centre was established in 1982 for developing and promoting technologies for harnessing solar energy. Due to its unrealistic budgeting and deficient performance, the Centre could not utilise more than one-third of its grants during 1992-97. It also failed to achieve its stated objectives, evident from the fact of gross under-utilisation of its solar thermal and photo voltaic testing facilities.

A solar thermal power plant of 50 KW capacity remained inoperative for more than five years. The plant was finally made operational at a downgraded capacity of 15-20 KW. The expenditure of Rs.2.43 crore including Rs.23.83 lakh on its repair, maintenance and staffing, thus, proved unfruitful. Equipment worth Rs.32.05 lakh procured for various projects remained idle and equipment costing Rs.89 lakh were installed after a delay ranging from 22 to 57 months. Assistance of DM 2.3 million was deferred for the second phase of a Indo-German project due to non-achievement of objectives in the first phase. A guest house constructed in 1991 at a cost of Rs.18.47 lakh remained unoccupied for five years raising doubts about its necessity.

(Paragraph 10.1)

List of Acronyms

AAR	Abstract Assets Register
AFRI	Arid Forest Research Institute
AMD	Atomic Minerals Division
ATN	Action Taken Note
BARC	Bhabha Atomic Research Centre
BEL	Bharat Electronics Limited
BHEL	Bharat Heavy Electricals Limited
BSF	Border Security Force
BWR	Boiling Water Reactor
C-DIT	Centre for Development of Imaging Technologies
CARI	Central Agricultural Research Institute
CBRI	Central Building Research Institute
CDRI	Central Drug Research Institute
CEDT	Centre for Electronics Design and Technology
CFFP	Ceramic Fuel Fabrication Plant
CICFRI	Central Inland Capture Fisheries Research Institute
CIF	Cost, insurance and freight
CIFA	Central Institute of Freshwater Acqua-culture
CIMAP	Central Institute of Medicinal and Aromatic Plants
CIRB	Central Institute for Research on Buffaloes
CISH	Central Institute of Sub-Tropical Horticulture
CPWD	Central Public Works Department
CRIJAF	Central Research Institute for Jute and Allied Fibres
CRRI	Central Rice Research Institute
CSIR	Council of Scientific and Industrial Research.
CSMCRI	Central Salt and Marine Chemicals Research Institute
CSS	Central Secretariat Service
CSWRI	Central Sheep and Wool Research Institute
DAE	Department of Atomic Energy
DBT	Department of Biotechnology
DDO	Drawing and Disbursing Officer
DESU	Delhi Electric Supply Undertaking
DFF	Drug Forms and Factories
DG	Director General
DOD	Department of Ocean Development
DOE	Department of Electronics
DOPT	Department of Personnel and Training
DOS	Department of Space
DPS	Directorate of Purchase and Stores
DRDO	Defence Research and Development Organisation
DST	Department of Science and Technology
DVB	Delhi Vidyut Board
DWR	Directorate of Wheat Research

ECF	External Cash Flow
EMDC	Electronics Material Development Council
ERDC	Electronic Research and Development Centre
FBTR	Fast Breeder Test Reactor
FCS	Flexible Complementing Scheme
FOB	Free on Board
FREEP	Forestry Research Education and Extension Project
FRI	Forest Research Institute
GB	Governing Body
GPD	Ganga Project Directorate
GFR	General Financial Rules
GLC	Gas Liquid Chromatograph
GOI	Government of India
GSFC	Gujarat State Fertilizers Company
GSI	Geological Survey of India
HPLC	High Performance Liquid Chromatograph
HSL	Hindustan Salt Limited
HWP	Heavy Water Plant
IARI	Indian Agricultural Research Institute
IASRI	Indian Agricultural Statistical Research Institute
ICAR	Indian Council of Agricultural Research
ICFRE	Indian Council of Forestry Research and Education
ICMR	Indian Council of Medical Research
IFGTB	Institute of Forest Genetics and Tree Breeding
IGFRI	Indian Grass Land and Fodder Research Institute
IICT	Indian Institute of Chemical Technology
IIP	Indian Institute of Petroleum
IISR	Indian Institute of Sugarcane Research
IIT	Indian Institute of Technology
ILRI	Indian Lac Research Institute
IMD	India Meteorological Department
IRS	Indian Remote Sensing
ITR	Interim Technical Report
ITRC	Industrial Toxicology Research Centre
IVRI	Indian Veterinary Research Institute
IWSU	Internal Work Study Unit
KW	Kilo Watt
LC	Letter of Credit
LOI	Letter of Intent
LPSC	Liquid Propulsion Systems Centre
LTC	Leave Travel Concession
MACE	Marine and Communication Electronics India Limited
MANAS	Merit and Normal Assessment Scheme
MC	Management Council
MIS	Management Information System

MIST-NIC	Meteorological Information System Terminal of National Informatics Centre
MNES	Ministry of Non-Conventional Energy Sources
MOEF	Ministry of Environment and Forests
MOF	Ministry of Finance
MSEB	Maharashtra State Electricity Board
MW	Mega Watt
NBAGR	National Bureau of Animal Genetic Resources
NBPGR	National Bureau of Plant Genetic Resources
NEHR	North Eastern Hills Region
NFC	Nuclear Fuel Complex
NGO	Non-Government Organisation
NICDAP	National Information Centre for Drug and Pharmaceuticals
NII	National Institute of Immunology
NIO	National Institute of Oceanography
NIRJAFT	National Institute of Research on Jute and Allied Fibre Technology
NMC	National Micro- Electronics Council
NML	National Metallurgical Laboratory
NPC	National Photonics Council
NPL	National Physical Laboratory
NRAS	New Recruitment and Assessment Scheme
NRC	National Radar Council
NRCWS	National Research Centre for Weed Science
NRDC	National Research Development Council
NSP	National Seed Project
OSEB	Orissa State Electricity Board
OTA	Overtime Allowance
PAC	Public Accounts Committee
PHWR	Pressurised Heavy Water Reactor
PME	Project Planning Monitoring and Evaluation
PRSG	Project Review and Steering Group
PV	Photo Voltaic
R&D	Research and Development
RARC	Research Appraisal and Review Committee
RC	Research Council
RRL	Regional Research Laboratory
S&T	Scientific and Technical
SAC	Science Advisory Committee
SBI	State Bank of India
SCI	Shipping Corporation of India Limited
SDUC	Secondary Data Utilisation Centre
SEC	Solar Energy Centre
SEK	Swedish Kroner
SERC	Structural Engineering Research Centre
SIU	Staff Inspection Unit

TA	Travelling Allowance
TDC	Technology Development Council
TFRI	Tropical Forest Research Institute
TNFD	Tamil Nadu Forest Department
UC	Utilisation Certificate
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VRDR	Vertical Retort Direct Reduction
WTCER	Water Technology Centre for Eastern Region
ZFP	Zircaloy Fabrication Plant/Project

Chapter 1 : Financial Management

1.1 Introduction

1.1.1 In pursuance of the national objective of making scientific and technological progress and attaining self-reliance, Government of India have been making consistent efforts to foster research and development (R&D) activities. The investment in R&D has increased from a paltry Rs.20 crore in the First Five Year Plan to about Rs.20,000 crore in the Eighth Five Year Plan.

1.1.2 The share of Government R&D expenditure in 1996-97 among the 13 major scientific agencies of Government of India was as follows:

(Rs.in crore)

Agency	Actual expenditure	Percentage
Defence Research and Development Organisation (DRDO)	1435.70	30.58
Department of Space (DOS)	1065.32	22.69
Indian Council of Agricultural Research (ICAR)	589.28	12.55
Department of Atomic Energy (DAE)	520.41	11.08
Department of Scientific and Industrial Research, including Council of Scientific and Industrial Research (CSIR)	457.26	9.74
Department of Science and Technology (DST)	351.92	7.49
Ministry of Environment and Forests (MOEF)	68.05	1.45
Department of Ocean Development (DOD)	59.47	1.27
Indian Council of Medical Research (ICMR)	57.04	1.22
Department of Electronics (DOE)	48.58	1.03
Department of Biotechnology (DBT)	37.77	0.80
Ministry of Mines-Geological Survey of India (GSI)	3.17	0.07
Ministry of Non-Conventional Energy Sources (MNES)	1.65	0.03
Total	4695.62	100.00

1.1.3 Significant achievements during 1996-97

Based on the information supplied by the Scientific Departments, the following were their significant achievements during 1996-97 :

Data acquisition was carried out by National Remote Sensing Agency with an efficiency of over 98 *per cent* through three antennas at earth station, Shad Nagar. Good quality data from both indigenous satellites of IRS series as well as from United States of America's LANDSAT-5 and NOAA-12 and 14 and Europe's ERS-1 and 2, was received.

The 40 Mega Watts (MW) Fast Breeder Test Reactor (FBTR), a major facility of Indira Gandhi Centre for Atomic Research at Kalpakkam, was operated at 10.5 MW. Irradiation campaign with a small core consisting of 25 fuel sub-assemblies was completed. FBTR was using indigenously developed mixed carbide fuel which is first core of its kind in the world. Turbine was also rolled successfully to synchronous speed of 3000 rpm.

A three-dimensional core burn-up code for use in predicting Prototype Fast Breeder Reactor sub-assembly powers was developed.

Cold commissioning process runs of the Kalpakkam Fuel Reprocessing Plant were successfully initiated on 23 March 1996.

Kamini, a 30 KW fuelled research reactor using Uranium-233 fuel, became operational on 29 October 1996 at Kalpakkam.

A computerised radioisotope package monitoring system was commissioned at Radio Pharmaceutical Laboratory, Vashi.

Completion of the design and installation of 64-node Anupam Super Computer System was a major success of Babha Atomic Research Centre (BARC). The peak speed of the Super

Computer is 5.7 Giga flops and sustained speed for the large computational jobs is about 400 Mega flops. The system is capable of processing computational jobs at a speed of five to seven times faster than the presently available high speed workstations and servers. The system was used for processing computational jobs in the field of fluid dynamics, electronics structure computations, molecular dynamics, neutron scattering, protein crystallography and gamma-ray astronomy. BARC, in collaboration with Department of Science and Technology (DST), successfully implemented the medium range weather forecasting codes on Anupam Super Computer.

A landmark achievement in neutron beam research instrumentation was the successful commissioning of two long cold neutron guides at the Dhruva reactor. The design, fabrication and installation of these guides was a totally indigenous effort.

Meteorological Information System Terminal of National Informatics Centre (MIST-NIC) was developed. MIST-NIC provided current weather conditions of about 500 cities in India and could be accessed from any NICNET Node.

1.1.4 Coverage under the Report

The comparative position of the expenditure of major scientific departments/organisations, covered in this Report, during 1996-97 and in the preceding two years was as given below:

(Rs.in crore)

Sl. No.	Ministry/Department/Organisation	1994-95	1995-96	1996-97
1.	Atomic Energy	1681.03	1960.22	2264.11
2.	Space	757.43	917.88	1065.32
3.	Indian Council of Agricultural Research	494.18	521.88	589.28
4.	Environment and Forests including Zoological Survey of India and Botanical Survey of India	387.53	373.20	520.04
5.	Science and Technology including Survey of India and India Meteorological Department	393.28	415.78	469.56
6.	Department of Scientific and Industrial Research (including grants given to Council of Scientific and Industrial Research)	374.00	431.61	466.11
7.	Non-Conventional Energy Sources	202.49	244.11	282.70
8.	Geological Survey of India (Ministry of Mines)	125.36	141.62	247.69
9.	Electronics	123.77	141.39	134.40
10.	National Informatics Centre (Planning Commission)	77.79	84.55	96.27
11.	Biotechnology	84.12	85.60	91.39
12.	Indian Council of Medical Research	59.32	62.52	66.95
13.	Ocean Development	57.63	58.24	64.05
14.	Centre for Development of Telematics (Department of Telecommunications)	44.11	31.33	46.53
	Total	4862.04	5469.93	6404.40

Important results of audit of accounts of these agencies and the institutions controlled by them which are engaged predominantly in the pursuit of science and technology, have been given in this Report.

1.1.5 Excess and savings in expenditure

A summary of Appropriation Accounts for 1996-97 in respect of the scientific departments/major scientific organisations, mentioned in para 1.1.4 is given below:

(Rs.in crore)

Sl. No.	Ministry/Department/ Organisation	Grant/ appropriation (including supplementary)	Expenditure	(-) Saving (+) Excess
1.	Atomic Energy	2283.25	2264.11	(-) 19.14
2.	Space	1078.74	1065.32	(-) 13.42
3.	Indian Council of Agricultural Research	582.54	589.28	(+) 06.74
4.	Environment and Forests, including Zoological Survey of India and Botanical Survey of India	552.77	520.04	(-) 32.73
5.	Science and Technology including Survey of India and India Meteorological Department	484.05	469.56	(-) 14.49
6.	Scientific and Industrial Research (including grants given to Council of Scientific and Industrial Research)	470.32	466.11	(-) 4.21
7.	Non-Conventional Energy Sources	370.02	282.70	(-) 87.32
8.	Geological Survey of India (Ministry of Mines)	268.82	247.69	(-) 21.13
9.	Electronics	156.20	134.40	(-) 21.80
10.	National Informatics Centre (Planning Commission)	104.80	96.27	(-) 8.53
11.	Biotechnology	96.67	91.39	(-) 5.28
12.	Indian Council of Medical Research	67.19	66.95	(-) 0.24
13.	Ocean Development	66.83	64.05	(-) 2.78
14.	Centre for Development of Telematics (Department of Telecommunications)	58.50	46.53	(-) 11.97
	Total	6640.70	6404.40	(-) 236.30

It would be seen from the above that there was an overall saving of Rs.236.30 crore, representing 3.56 *per cent* of overall provision of funds.

1.1.6 Adverse balances appearing in the Finance Accounts

'Civil Deposits' head should normally close with credit balance as payments against deposits should not exceed the deposits received. Similarly, 'Reserve fund' head should close with credit balance. 'Loans and Advances' head should close with debit balances to show the position of outstanding balances awaiting recovery/adjustment. However, Statement No.13 of the Finance Accounts of the Union Government for the year

1996-97 revealed the following cases of adverse balances relating to Scientific Departments:

1	Department of Space 8443-Civil Deposits 106 Personal Deposits	Rs.16,38,000 (Dr)
2	Ministry of Science and Technology J - Reserve Fund	Rs.34,20,000 (Dr)
3	Department of Ocean Development 7610- Loans to Govt. Servants, 203 - Advance for purchase of other conveyance	Rs.3,000 (Cr)

In the case of Department of Space, adverse balances under 'Civil Deposits' were pointed out in the Reports of Comptroller and Auditor General of India, Union Government (Scientific Departments) for the year ended 31 March of 1993, 1994, 1995 and 1996 also. The Department stated, in December 1997, that action to adjust the adverse balances was under pursuance.

In the case of Ministry of Science and Technology, 'Reserve Fund' was showing opening balance of Rs.65.80 lakh (Cr) as on 1 April 1996 and disbursement during the year was recorded as Rs.100 lakh, thereby, showing an adverse balance of Rs.34.20 lakh (Dr) as on 31 March 1997. Ministry stated, in November 1997, that action had been initiated to liquidate the adverse balance.

The adverse balances which could be due to misclassification or excess refunds or non-reconciliation of accounts or due to some other reasons, require investigation and rectification urgently.

1.1.7 Audit of accounts of autonomous bodies

Accounts of autonomous bodies which received grants and loans from the Ministries and Departments of the Government are audited by the Comptroller and Auditor General of India under the relevant provisions of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

As on 31 March 1997, there were 54 autonomous bodies receiving recurring grants from the Scientific Departments of Government of India. These autonomous bodies were paid grants of Rs.1465.86 crore during 1996-97 as indicated in Appendix-I. They were required to submit their accounts for audit by the Comptroller and Auditor General of India. Out of 54, accounts of nine autonomous bodies for/or upto the year 1996-97 had not been received for audit as of January 1998.

Under Sections 19 (2) and 20 (1) of this Act, separate Audit Reports are prepared on the accounts of seven autonomous bodies viz. Indian Council of Medical Research, Wild Life Institute of India, Central Zoo Authority, Sree Chitra Tirunal Institute of Medical Sciences and Technology, Council of Scientific and Industrial Research, Indian Council of Agricultural Research and Technology Development Board.

1.2 Outstanding utilisation certificates

6585 utilisation certificates for grants aggregating Rs.532 crore were outstanding as on 31 March 1997

Certificates of utilisation of grants are required to be obtained by the Ministries and Departments from the grantees i.e. statutory bodies, non-government institutions etc. indicating that the grants had been utilised for the purpose for which they were sanctioned and that, where the grants were conditional, the prescribed conditions had been fulfilled. 6585 utilisation certificates for grants aggregating Rs.532 crore were outstanding as given in Appendix II. This did not include the utilisation certificates awaited in respect of the Ministry of Non-conventional Energy Sources, where the relevant records prior to 1994-95 were reportedly destroyed in fire. Main defaulting Ministries/Departments were (i) Environment and Forests (ii) Ocean Development (iii) Electronics and (iv) Non-Conventional Energy Sources.

Utilisation certificates in 4587 cases aggregating Rs.340 crore were outstanding for more than three years. The Departments need to look into this and obtain the certificates or recover the amounts.

1.3 Follow up on Audit Reports

To ensure enforcement of accountability of the executive in respect of all the issues dealt with in various Audit Reports, the Public Accounts Committee (PAC) decided in 1982 that Ministries/Departments should furnish remedial/corrective action taken notes (ATN) on all paragraphs contained therein.

PAC recommended submission of all pending ATNs upto 1995 within three months

The Committee took a serious view of the inordinate delays and persistent failures on the part of a large number of ministries/departments in furnishing the ATNs in the prescribed time frame. In their Ninth Report (Eleventh Lok Sabha) presented to the Parliament on 22 April 1997, the PAC desired that submission of pending ATNs pertaining to Audit Reports for the years ended March 1994 and March 1995 be completed within a period of three months and recommended that ATNs on all paragraphs pertaining to the Audit Reports for the year ended 31 March 1996 onwards be submitted to them duly vetted by Audit within four months from the laying of the Reports in Parliament.

From 1995-96, ATNs are to be submitted within four months of placing the Reports in Parliament

Review of outstanding ATNs on paragraphs included in the Reports of the Comptroller and Auditor General of India, Union Government (Scientific Departments) as of January 1998 revealed as under :

Ministry/Department/Council	No. of Paragraphs for which ATNs were awaited	Audit Reports to which Paragraphs indicated in column 2 pertain
Mines (Geological Survey of India)	1	1993-94
Non-conventional Energy Sources	2	1994-95
Department of Atomic Energy	2	1995-96
Department of Ocean Development	1	1995-96
Council of Scientific and Industrial Research	2	1995-96

ATNs on the above eight paragraphs were outstanding in disregard to general instructions issued by the Lok Sabha Secretariat and the Ministry of Finance, in pursuance of PAC's recommendations, for prompt submission of ATNs. Details are given in Appendix III.

The position of pending ATNs was reported to the Ministries/ Departments/Council in December 1997; their replies were awaited as of January 1998.

Chapter 2 : Council of Scientific and Industrial Research

2.1 Manpower Audit

2.1.1 Introduction

Council of Scientific and Industrial Research (CSIR) was established in March 1942 as a society under the Societies Registration Act, 1860 for promotion, guidance and co-ordination of scientific and industrial research, collection and dissemination of information on research and industrial matters and exploitation of research results towards development of industries in the country. It has 41 national laboratories/institutes within its fold. These laboratories, located all over the country, are conducting research and development (R&D) activities in diverse fields.

2.1.2 Scope of Audit

This review, apart from analysing the trends in expenditure relating to manpower, focuses on the issues relating to manpower planning, recruitment, deployment and promotion. The review mainly covers the following six laboratories, besides CSIR headquarters :

- Central Building Research Institute (CBRI), Roorkee
- Central Drug Research Institute (CDRI), Lucknow
- Indian Institute of Petroleum (IIP), Dehradun
- Industrial Toxicology Research Centre (ITRC), Lucknow
- National Physical Laboratory (NPL), New Delhi
- Structural Engineering Research Centre (SERC), Ghaziabad

2.1.3 Organisational set up

The Prime Minister of India and the Minister of Science and Technology are the ex-officio President and Vice-President of CSIR. The affairs of CSIR are administered, directed and controlled by a Governing Body (GB) headed by the Director General (DG) as its Chairperson. At CSIR headquarters, various sections under the charge of Joint Secretary (Administration) are responsible for personnel policies and functions.

2.1.4 *Highlights*

- **CSIR failed to evolve standard norms for assessment of its staff requirement at headquarters and laboratories. The ratio of scientific to non-scientific staff was very high.**

  14 laboratories had 622 scientific and technical staff in excess of their sanctioned strength as of July 1995. Details of excess posts operated, if any, in other laboratories were not available on record.

  Despite 735 vacancies in the sanctioned strength of administrative posts, Government's directives of February 1992 for 10 *per cent* reduction in posts were not complied with in respect of these posts as of June 1997.

  (Para 2.1.7)

- **IIP engaged upto 116 persons through contractor for technical and administrative work of regular nature without approval of CSIR. CDRI engaged 245 persons through a contractor for cleaning of laboratories and office buildings without following correct procedure.**

  Despite ban on engagement of casual workers for work of a regular nature, 1107 casual workers were engaged prior to April 1990, in 26 laboratories/ CSIR headquarters, of which 75 workers had been absorbed and 1032 were awaiting absorption against regular vacancies as of July 1996.

  Contrary to the instructions of Ministry of Finance to keep the expenditure on overtime allowance to the level of 1990-91, it increased from Rs.81.57 lakh in 1992-93 to Rs.151.56 lakh in 1996-97.

In many cases, persons holding scientific/technical grades/posts did not possess even the minimum qualification prescribed for entry level posts.

(Para 2.1.8)

- **The assessment promotion scheme, similar to the flexible complementing scheme providing *in situ* promotion, though meant for scientists only, was extended to entire engineering and technical staff upto the lowest level and also to some categories of administrative staff classified as technical, resulting in undue benefits of time bound assessment promotion and higher retirement age of 60 years to around 12807 engineering, technical and supporting staff.**

  All the 1667 scientific and technical staff promoted in six laboratories and CSIR headquarters during 1992-97 were given the benefit retrospectively for periods upto five years and more.

  To provide promotional avenues to the administrative staff, comparable to scientific and technical staff, CSIR carried out cadre reviews of administrative staff thrice in a span of seven years between August 1987 and October 1994 and created 278 new (additional) posts besides upgrading 1740 posts to next higher grades at different levels without the approval of Finance Minister in violation of Government's orders.

  Ignoring repeated directives of Department of Personnel and Training and Ministry of Finance, CSIR granted higher pay scale of Rs.1640-2900 to four categories of its administrative staff including Assistants.

Of the 74 administrative staff inducted into technical stream in six laboratories, 53 did not have the required technical qualifications and experience prescribed for direct recruitment.

(Para 2.1.9)

- The output of R&D activities of scientific manpower was dismal. 271 scientists in six laboratories did not contribute any research paper during 1992-97, 88 scientists contributed only one research paper each and 91 scientists contributed only two research papers each. ITRC developed only one technology during 1992-97.

(Para 2.1.10)

- 310 employees, rendered surplus due to closure of two units, were adjusted in various laboratories, irrespective of availability of vacancies and/ or their suitability to the concerned laboratory.

  On transfer of SERC from Roorkee to Ghaziabad, 15 scientific, 49 technical and 28 administrative staff of SERC were transferred to CBRI to avoid their dislocation, while SERC suffered staff shortage and the resultant operational problems.

  Unfruitful expenditure of Rs.29.32 lakh was incurred on salaries of 15 persons, during 1995-97, deployed in four extension centres of CBRI which were recommended for closure as far back as August 1994.

(Para 2.1.11)

- CSIR lacked an effective management information system for the efficient control of manpower operations.

(Para 2.1.12)

2.1.5 *Expenditure on Manpower*

Based on the data supplied by CSIR, the receipts during various Plan periods and expenditure on manpower were as given below:

(Rupees in crore)

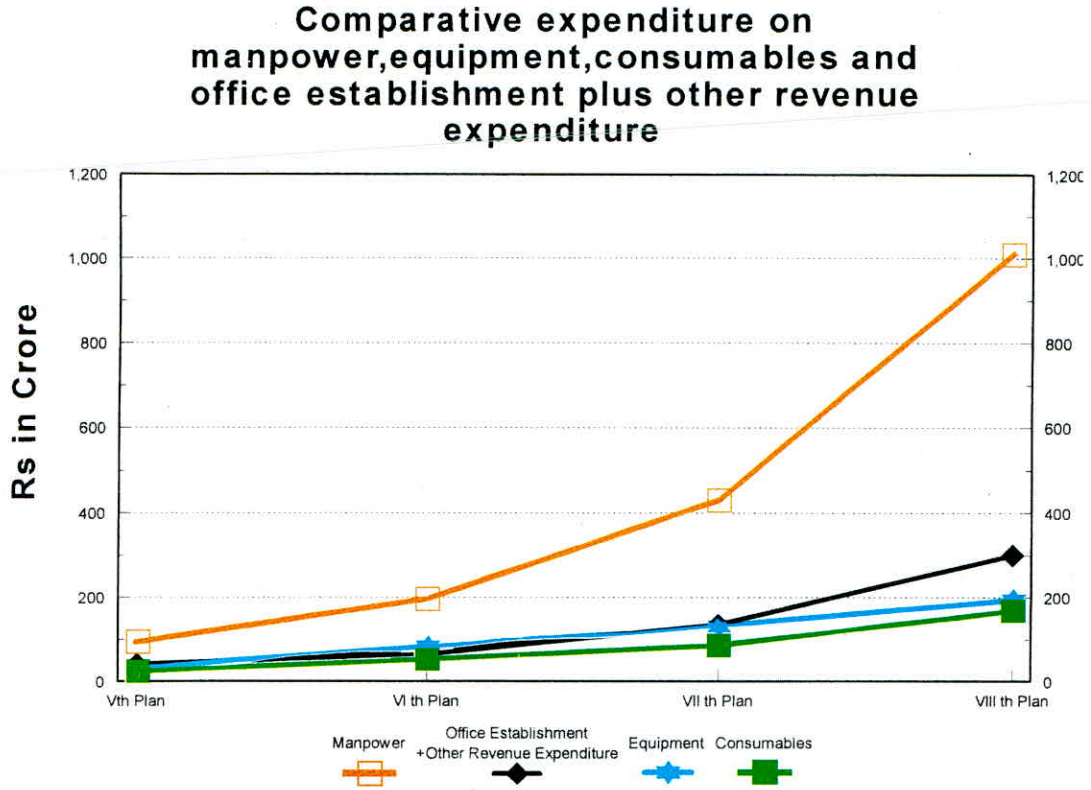
Plan	Period	Receipts		Total Expenditure	Expenditure on manpower
		Grants from DSIR	Other receipts		
V	1974-79	203.54	20.69	228.23	93.75
Plan Holiday	1979-80	48.16	5.48	53.76	20.89
VI	1980-85	448.70	40.71	490.08	195.04
VII	1985-90	907.10	79.59	986.63	428.31
Plan Holiday	1990-92	471.87	63.52	531.00	248.58
VIII	1992-97	1790.87	204.86	1987.23	1007.64

Actual expenditure on manpower included expenditure on salaries, wages and pension. CSIR did not supply the details of expenditure on wages during 1974-94. The information regarding sanctioned strength, men-in-position, contract/ contingent employees and additional posts created during Fifth to Eighth Plan period was not supplied by CSIR.

The categories and grades existing in scientific, technical and administrative cadres including supporting staff etc. in CSIR and its laboratories as on 1 April 1997 were as given in Appendix IV.

2.1.6 *Trend analysis of expenditure on manpower, equipment, consumables and office establishment*

The trend analysis of data on expenditure on manpower, consumables, equipment and other office expenses, as reflected in Appendix V, revealed that increase in manpower and other office expenses was more pronounced than increase in expenditure on the other two R&D inputs - equipment and consumables as depicted in the following graph:



Expenditure on manpower, office establishment and other revenue expenditure was substantially higher than on equipment and consumables

Other conclusions emerging from the trend analysis were as under:

(i) The expenditure on manpower as compared to that on equipment and consumables increased at a faster rate due to steady rise in the salary bill. From 41.07 *per cent* of the total expenditure during Fifth Plan, the expenditure on manpower rose to 50.70 *per cent* in the Eighth Plan, reducing availability of financial resources for other inputs for R&D activities.

(ii) Despite Government's directives of January and February 1992 for reducing administrative expenditure and abolishing at least 10 *per cent* posts at all levels, the expenditure on manpower and office establishment during Eighth Plan increased by 135 and 162 *per cent* respectively as compared to Seventh Plan.

(iii) During Eighth Plan period, 65.83 *per cent* of total expenditure was incurred on manpower, office establishment and other revenue expenditure as compared to 17.80 *per cent* on equipment and consumables.

The balance of 16.37 *per cent* was spent on capital heads and grants released to other agencies for research.

(iv) In CBRI, CDRI and NPL while expenditure on salaries, office establishment and other revenue expenditure increased substantially during the Eighth Plan, the expenditure on equipment and consumables decreased.

2.1.7 Manpower Planning

(a) Absence of mechanism for assessing manpower requirement

Instead of undertaking any systematic study to assess manpower requirement, CSIR adopted *ad hoc* approach for fixing sanctioned strength of different categories of manpower at its headquarters and laboratories as was borne out from the following:

CSIR failed to evolve any mechanism for systematic assessment of its manpower requirement including setting up of IWSU and SIU

(i) CSIR did not comply with Government's instructions regarding constitution of Internal Work Study Unit (IWSU) and internal Staff Inspection Unit (SIU) with core members drawn from the SIU of Ministry of Finance (MOF) for laying down norms, evolving standards of performance and studying the staffing of establishment to achieve economy in staff consistent with efficiency.

Without assigning any reason for disregarding Government's instructions, CSIR stated in July-August 1997 that no IWSU/SIU existed or was operational in its set-up.

(ii) CSIR had not taken any action to evolve standard norms of its own to assess the requirement of scientific, technical and administrative manpower except for setting up project Planning, Monitoring and Evaluation (PME) cells at laboratories. While no PME cell was constituted by SERC, CBRI and NPL deployed upto 17 and 12 persons respectively during 1992-97 in their PME cells against the ceiling of three scientists and two supporting staff laid down by CSIR in 1984.

(iii) CSIR engaged house-keeping staff much in excess of the limit prescribed by MOF in September 1989 as reflected by the following data relating to the six laboratories:

Name of laboratories	Total strength as on 1 April 1997	House -keeping manpower		
		Maximum permissible	Actual	Excess
CBRI	662	23	41	18
CDRI	939	33	52	19
IIP	732	26	53	27
ITRC	374	13	26	13
NPL	1291	45	147	102
SERC	160	7	9	2

(iv) In spite of large number of vacancies in each cadre in the six laboratories, as shown in Appendix VI, CDRI, IIP and ITRC stated in June-July 1997 that the entire work was managed by them with their existing staff and no project was dropped/postponed. This indicated that the sanctioned strength of the laboratories was fixed much in excess of the actual requirement of manpower with reference to the volume of work.

(b) Excessive non-scientific manpower

The ratio of scientific to non-scientific staff in six laboratories was much higher than the ratio of 1:1.5 recommended by a committee appointed to review the functions and structure of CSIR. 10 out of 41 laboratories were having manpower exceeding the maximum recommended ceiling of 750 personnel

A committee, appointed by CSIR's President to review its functions and structure, recommended in December 1986, *inter alia*, a limit of 350 personnel for the new laboratories and 750 for the old ones besides scaling down the ratio between scientific and non-scientific personnel from the existing 1 : 3 to 1 : 1.5. Though Science Advisory Council (SAC) to the Prime Minister and GB accepted the recommendation, the latter did not favour specifying rigid numbers or ratios. Data given in Appendix VII reflects lack of effective measures on the part of CSIR to achieve the recommended relative ratio for different kinds of manpower. The actual ratio of scientific to non-scientific manpower deployed at six laboratories continued to be in the range of 1 : 2.13 to 1 : 3.88. In 10 out of 41 laboratories manpower exceeded the recommended limit of 750. Similarly, the other recommendation of the Committee for closing down Regional Research Laboratory, Bhopal and about 100 field centres of CSIR laboratories, in view of their dismal performance and failure to serve the intended purpose, was also not acted upon by CSIR for the reason that the respective State governments desired their continuance.

(c) Employment of staff in excess of sanctioned strength

14 laboratories employed 122 scientists and 500 technicians in excess of their sanctioned strength as of July 1995

Test-check of records in CSIR headquarters revealed that 14 laboratories employed 122 scientists and 500 technicians in excess of their sanctioned strength as of July 1995 as shown in Appendix VIII. Details of excess posts operated, if any, in other laboratories were not available on record.

(d) Non-abolition of vacant posts

Government orders for abolition of posts lying vacant for over one year were not complied with

MOF issued instructions in May 1993 for abolishing posts kept in abeyance or lying vacant for more than one year, issuing abolition orders within a month thereafter and following the procedure prescribed for creation of new posts in case the post was required to be revived subsequently. These instructions were not complied with by CSIR. The details of such vacancies ranging between 454 and 537 during 1993-96 in CDRI, IIP, NPL and SERC falling within the purview of these orders are given in Appendix IX. CBRI, ITRC and CSIR headquarters did not supply the required information.

(e) Non-compliance of Government's directives for reduction of ten per cent posts

Government's directives for 10 *per cent* reduction in posts were not complied with in respect of administrative posts

Following a decision taken in the meeting of the National Development Council in December 1991, MOF directed all Departments including DSIR in January-February 1992 to carry out a review of all posts under them to reduce the posts by at least 10 *per cent*. Although DG, CSIR committed to the Cabinet Secretary in February 1992 itself for exploring all possibilities of reduction in posts and to intimate results shortly thereafter, necessary action to identify posts for reduction was taken only in July 1995 on being reminded by MOF in April 1993 and January 1995 and by the Cabinet Secretary in June 1995. Accordingly, 2079 scientific and technical (S&T) posts were reduced in September 1995. Though there were 735 vacancies in the sanctioned strength of administrative posts as of September 1995, these were left untouched. CSIR sought exemption from MOF in June 1997 for such reduction of administrative posts on the plea that the total strength of 6528 administrative posts, as of June 1997, worked out only to 33.85 *per cent* of S&T posts which was quite inadequate to meet the

requirement of laboratories. The contention of CSIR was not tenable as the administrative staff in CSIR was alarmingly higher than the norm of 3.44 *per cent* prescribed for staffing the house-keeping functions by SIU of MOF in September 1989. Therefore, non-imposition of 10 *per cent* statutory reduction in administrative posts was not justified.

(f) Use of scientific and technical manpower for non- R&D work

49 scientists and 155 technicians in six laboratories were deployed on work other than R&D. Besides, 83 scientists and 222 technicians were deployed at CSIR headquarters without any R&D work

Notwithstanding the large number of vacancies in the respective cadres, 49 scientists and 155 technicians in six laboratories were assigned non-R&D work. At CSIR headquarters, where no R&D work is undertaken, 83 scientists and 222 technicians were deployed as of March 1997, for which no justification was on record or furnished to Audit.

(g) Idle manpower

18 S&T and 11 supporting staff of CBRI were re-deployed after a gap of 6 to 12 months

In CBRI, 18 S&T and 11 supporting staff available for re-deployment on completion of six projects were assigned new projects after a gap of 6 to 12 months. CBRI stated in May 1997 that preparation and approval of projects and/ or development of infrastructure for new projects took a lot of time. Evidently, CBRI was unable to plan timely preparation and approval of projects to avoid idling of manpower.

2.1.8 Recruitment and deployment

(a) Irregular employment of staff through contractors for work of regular nature

Contrary to repeated instructions of CSIR prohibiting engagement of workers on contract basis for any work of regular nature, its laboratories resorted to engaging contract workers which helped them in circumventing not only the usual recruitment procedure but the ban on creation of posts and recruitment as well. CSIR's instructions of March 1990 making the approval of DG mandatory in such cases were flouted by the laboratories without being questioned by CSIR headquarters.

(i) IIP employed 9 persons in 1983, 11 persons in 1984 and 21 persons in 1985 on contract basis as typists, helpers, drivers, technicians

etc. for work of regular nature in defiance of CSIR orders and the prevalent ban on creation and filling of posts. IIP stated in May 1997 that the exact period upto which these persons continued to work was not available on record.

IIP engaged upto 116 employees through contractor without tendering, for office/ technical work and irregularly sanctioned honorarium and *Diwali* gifts to such staff

In January 1992, IIP started employing manpower for regular work through contractors without inviting tenders and without signing any contract. The method of fixing wages was not transparent. The number of such workers increased from 17 in 1992-93 to 116 in 1996-97. The system of hiring manpower through contractor, going by the records of IIP, was only a cover. The persons to be employed were identified and sanction obtained by name for employing them through the contractor. Interestingly, though stated to be employed through contractor, about 50 persons continuously served at IIP for periods ranging from four to six years and another 40 persons for two to four years despite the change of contractor in August 1995. This system facilitated hiring of close relatives of the employees of IIP, which as per its own reckoning, constituted about 30 *per cent* of such workers. Incidentally, the apprehension of employees unrest acted as a deterrent for IIP to contemplate retrenchment of the persons so employed. The entire manpower so engaged was deployed on regular nature of work i.e. typist, computer operator, Xerox operator, helper, driver, cook, draftsman, electrician, wireman etc. Not only such appointments lacked justification, the minimum qualification required for such jobs was also ignored. Although four posts of clerks were being operated in excess of the sanctioned strength, additional 26 persons were employed through contractor to work as typists, computer operators etc. The sanction of DG for employing workers through contractor, though mandatory, was not obtained. IIP failed to produce the files relating to the contract for the period January 1992 to July 1995 and did not intimate the total expenditure incurred during this period on this account. From August 1995 to March 1997, the total payments aggregating Rs.25.29 lakh, including Rs.1.89 lakh on account of service charges and Rs.0.92 lakh on account of honorarium and *Diwali* gifts, were made to contractor.

While admitting that the Government of India/ CSIR had banned employment of staff for work of regular nature through private manpower

supply agency, IIP stated, in June 1997, that its main objective was to increase the external cash flow and during the last five years it had earned substantial amount from transfer of technologies and royalties. It further stated that owing to ban on employment of daily wagers it resorted to engagement of manpower through contractors. IIP, however, did not clarify how engagement of contract labour would lead to generation of more cash flow. Thus, not only the orders of Government of India/CSIR on the subject were defied, even the normal procedure of giving detailed justification for additional manpower and tendering for competitive rates were not observed by IIP.

(ii) CSIR authorised all its laboratories in July 1987 to entrust the work of sweeping, cleaning, dusting and watching of buildings owned or occupied by its offices to private agencies selected on the basis of open competition.

CDRI engaged 168 workers through contractor for cleaning of laboratories/office and 77 workers to perform duties of Group 'D' staff at a total cost of Rs.80.21 lakh during 1992-97

Without following any norms, CDRI engaged 168 workers on annual basis during 1992-97 through a contractor without competitive bidding for cleaning of the laboratory and the Animal House. CDRI engaged another 77 workers ostensibly for washing, cleaning and maintenance of glassware, tables and other manual work in various divisions and sections of the Institute and deployed them to perform duties of Group D staff. Total payments aggregating Rs.80.21 lakh were made to contractor during 1992-97 of which Rs.29.65 lakh pertained to additional 77 workers engaged for routine work in various divisions and sections.

The instructions of CSIR to engage a contractor on the basis of competitive bidding were not followed and the same contractor was engaged year after year for this purpose by CDRI.

(iii) CSIR's instructions of July 1987 authorised the laboratories to meet only their additional requirement of security staff through private agencies. The position of security personnel taken on contract and expenditure thereon in respect of six laboratories audited was as under:

(Rs.in lakh)

Name of laboratory	Regular staff in position as on 1 April 1992	No. of contract security staff engaged and expenditure incurred									
		1992-93		1993-94		1994-95		1995-96		1996-97	
		No.	Rs	No.	Rs	No.	Rs	No.	Rs	No.	Rs
CBRI	16	NA	1.14	NA	5.18	NA	4.03	NA	5.90	NA	7.43
CDRI	5	37	5.63	37	4.67	37	7.32	40	6.51	40	9.86
IIP	24	54	NA	54	NA	58	12.38	58	11.98	63	13.85
ITRC	8	28	5.89	28	6.31	21	5.59	21	6.10	21	8.05
NPL	32	12	2.97	15	4.53	15	3.44	15	3.38	20	4.25
SERC	6	21	3.77	21	4.75	21	5.57	22	6.37	30	8.13

Scrutiny of records of the laboratories revealed that:

Six laboratories engaged more than 174 security staff through contractors at a cost of Rs.174.98 lakh during 1992-97 and deployed most of the 91 security guards on their regular strength to perform duties of Group 'D' staff or inducted them into technical stream

- Despite having full complement of 16 security staff, CBRI resorted to contracting out security work without justification and incurred avoidable expenditure of Rs.23.68 lakh during 1992-97. The manner of utilisation of regular staff and number of persons engaged on contract was not intimated by CBRI.

- In the absence of any norms, IIP engaged 54 to 63 security persons through contractor without any addition of building in its compound. IIP did not furnish the details of deployment of its 24 regular security personnel.

- NPL engaged 12 persons in 1992-93 and increased the strength upto 20 during 1996-97 for security of staff colony. Since the security of staff colony was not the responsibility of NPL, the expenditure of Rs.18.57 lakh incurred on security of staff colony during 1992-97 was irregular. Besides, in spite of availability of 32 persons on regular strength, NPL engaged another 21 persons through a private agency in March 1997 at an annual cost of Rs.5.46 lakh on the plea that, owing to frequency of leave/ ill health, the regular staff was unable to discharge the security duties of NPL complex efficiently.

- Apart from the above, CSIR headquarters too contracted out security work of its building to a private agency by employing 19 security personnel from December 1996 onwards, rendering the 21 security personnel on its regular strength surplus. Eight of the security guards were deployed as Group 'D' in various sections.

CSMCRI engaged 32 to 45 security personnel during June 1993 to June 1997, against shortage of only two to five regular staff, at a cost of Rs.32.12 lakh

- Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar, irregularly engaged 32 to 45 security personnel on contract at a cost of Rs.32.12 lakh during June 1993 to June 1997 against shortage of only three to five security staff.

Although, CSIR clarified to CSMCRI, in June 1993, that security contracts were permissible only to the extent of shortage of manpower after taking into account security guards on rolls, neither CSIR nor laboratories cared to limit the contract staff to the extent of shortage but contracted out entire security work and deployed regular staff on Group 'D' duties or inducted them into technical stream.

(b) Irregular recruitment of staff on regular basis for sponsored schemes

Instead of making appointments on temporary basis, CDRI appointed 37 persons for two sponsored schemes on regular basis, some of which were still awaiting absorption against regular vacancies as of July 1997 while Rs.84.71 lakh were pending recovery from sponsor of the schemes

The instructions issued by CSIR required the laboratories to manage sponsored projects, as far as possible, with the existing manpower and to resort to project specific manpower recruitment on behalf of sponsors purely on temporary basis for the duration of the project. CDRI, however, recruited four scientists, 27 technicians and six administrative personnel for two sponsored schemes on regular basis as detailed in Appendix X. Having erroneously recruited them as regular staff, CDRI approached CSIR headquarters in May 1987 for their regularisation. CSIR agreed to the proposal on the condition of the sponsor continuing the financial support on permanent basis. In July and October 1988, CSIR extended the benefits available to its regular employees to the scheme staff as well. However, considering the negligible revenue generated through one of these schemes, the sponsor indicated its inability to provide support beyond 1995. An amount of Rs.84.71 lakh was pending recovery from sponsor upto 1996-97.

CDRI stated in July 1997 that the scheme staff so absorbed would be adjusted as and when vacancies in groups were available.

(c) Unauthorised engagement of casual workers resulting in liability for permanent absorption

1107 casual workers were engaged in 26 laboratories prior to April 1990 for work of regular nature in defiance of orders of the Vice-President and DG. Of these, 1032 were awaiting absorption against regular vacancies as of July 1996

Flouting the repeated orders of DG and Minister of Science and Technology and ex-officio Vice-President of CSIR, banning employment of daily wage workers except for seasonal/occasional work for specific duration, 26 laboratories engaged 1107 casual/daily wage/contract workers upto March 1990 for regular nature of work. Of these, 250 workers were engaged by CBRI, CDRI, ITRC, NPL and eight by CSIR headquarters itself.

Subsequent to the issue of the Government's orders of June 1988 regarding regularisation of casual workers, CSIR listed 1077 casual/daily wage/contract workers, apart from 30 already absorbed by NPL, for absorption against the vacancies. Of these, 45 workers were absorbed against regular vacancies as of July 1996 and remaining 1032 workers were awaiting absorption.

Thus, the instructions of CSIR regarding engaging casual workers were observed more in breach than compliance not only by the laboratories but CSIR headquarters as well. As a result, besides incurring expenditure of Rs.142.62 lakh in four laboratories alone during 1992-97, CSIR and its laboratories were saddled with the liability to regularise in future the remaining casual workers. Besides, engagement of staff through contractors or as casual workers for technical and administrative work of a regular nature, in addition to the regular staff, also resulted in deployment of manpower in excess of the sanctioned strength as shown in Appendix XI.

(d) Payment of overtime allowance despite excess staff

Despite engagement of excess staff expenditure on OTA increased from Rs.81.57 lakh in 1992-93 to Rs. 151.56 lakh in 1996-97

In spite of having engaged excess staff and repeated instructions of MOF to keep the expenditure on overtime allowance (OTA) to the level of 1990-91, the expenditure on payment of OTA to administrative and

technical supporting staff in respect of all laboratories and CSIR headquarters increased from Rs.81.57 lakh in 1992-93 to Rs.151.56 lakh in 1996-97. In case of CBRI, IIP, NPL and CSIR headquarters, the expenditure rose from Rs.1.00 lakh, Rs.4.75 lakh, Rs.5.74 lakh and Rs.5.85 lakh in 1992-93 to Rs.2.88 lakh, Rs.8.14 lakh, Rs.10.66 lakh and Rs.11.01 lakh respectively in 1996-97.

(e) Recruitment and promotion of unqualified staff for scientific and technical posts

Persons not possessing academic/ technical qualifications prescribed for entry level posts were appointed/ promoted to scientific/ technical posts. Most of them were deployed on non-R&D work

Scrutiny of records revealed that in a number of cases the persons holding scientific/ technical grades/ posts did not possess even the minimum qualification prescribed for the entry level posts, as shown below :

Sl. No	Name of laboratory	Post held / Pay scale	No. of persons	Entry level qualification	Actual qualification
1.	CBRI	Scientist E-I Rs.3700-5000	2	Ist Class MSc/ Ist Class B.E./ M.Tech./ME/ MBBS/M.Pharma/ Ph.D. (Science)	B.Sc., B.Lib. Sc., M.A. (Economics)
2.	CDRI	Scientist E - I Rs.3700-5000	1	- do -	B.Sc., Diploma in Library Science
3.	CDRI	Scientist C Rs.3000-4500	1	- do -	High School and Diploma in Electrical Engineering
4.	CDRI	- do -	1	- do -	High School and ITI (Fitter)
5	CDRI	Scientist B-I Rs.2200-4000	1	- do -	B.Sc., M.A.,LL.B.
6	CDRI	- do -	1	- do -	M.A. (English), M.Com., LL.B.
7	CDRI	Scientist B-I Rs.2200-4000	1	- do -	Intermediate and two years Diploma in Refrigeration Engineering
8.	IIP	Scientist 'C' Rs.3000-4500	1	- do -	Intermediate
9.	ITRC	Scientist E-II Rs.4500-5700	1	-do-	LL.B., B.Lib.Sc.
10.	ITRC	Scientist E-I Rs.3700-5700	1	-do-	M.Sc. (Statistics)
11.	ITRC	-do-	1	-do-	B.Tech. (Electronics)
12.	NPL	Scientist E-I Rs.3700-5000	1	- do -	M.A. (Economics)

13.	NPL	- do -	2	- do -	B.Sc., M.A.
14.	NPL	- do -	3	- do -	B.Sc.
15.	NPL	- do -	1	- do -	Diploma in Engineering
16.	NPL	Scientists E-I Rs.3700-5000	1	-do-	M.A.(Pol. Sc.)
17.	NPL	Scientists E-I Rs.3700-5000	1	-do-	M.A.(Maths)
18.	NPL	Scientist B Rs.2200-4000	1	-do-	M.A.(Economics), B. Lib.Sc.
19.	CSIR	Scientist 'C' 3000-4500	2	-do-	National Trade Certificate in Draftsmanship (Mechanical)
20.	CSIR	Scientist E-I Rs.3700-5000	1	-do-	M.A.
21.	IIP	Technical Officer Rs.2000-3500	1	Ist Class B.Sc./ Diploma in Engineering	B.A., Diploma in Photography
22.	IIP	- do -	4	- do -	Matric/ Intermediate
23.	IIP	Technical Officer Rs.3000-4500	4	- do -	Intermediate
24.	IIP	Technical Officer Rs.2000-3500	9	- do -	ITI
25.	IIP	Technical Officer Rs.2000-3500	1	- do -	Vth
26.	IIP	-- do --	1	- do -	IXth
27.	NPL	Technical Officer (C) Rs.3000-4500	1	- do -	B.A.
28.	CSIR	Technical Officer (Xerox operator) Rs.2200-4000	2	- do -	Matriculation
29	NPL	Technician Group II (1) Rs.950-1400	3	SSC/Xth with ITI certificate	VIth / High School
30	NPL	Technician Grade II (2) Rs.1350-2200	18	- do -	NIL/Ist/VIIIth/Matric
31	NPL	Technician Grade II (3) Rs.1400-2300	3	- do -	Middle School/Matric
32	NPL	Technician Grade I (3) Rs.950-1400	9	SSC/Xth	NIL/Vth/VIIIth

Thus, qualification was diluted to allow benefits of recruitment/promotion to unqualified staff. As a result, many of these employees were assigned jobs not commensurate with their respective grades. To illustrate, CDRI accommodated all the six scientists on non- R&D activities while NPL deployed many of the technical staff on non-technical duties like collection of stationary, distribution of *dak*, helping store assistant in issue of materials, packing of parcels, shifting of gas cylinders, Xeroxing of papers, distribution of circulars/files etc. How the appointment of non-scientific personnel, with 'Humanities' background on S&T posts would contribute to R&D efforts needs to be looked into by CSIR.

(f) Creation and filling of posts in defiance of ban imposed by Government

Additional posts of 167 scientists, 137 technicians and 80 administrative staff were created in defiance of ban

Though CSIR stated in August 1997 that no additional post was sanctioned for laboratories, test-check of records in six laboratories revealed that, in defiance of the ban imposed by the Government of India (GOI) in January 1984 on creation and filling of posts as an anti-inflationary measure, it created additional posts of 167 scientists, 137 technicians and 80 administrative staff in CDRI, ITRC, NPL and SERC during the ban period. During this period, 27 posts of scientists, 57 of technicians and 33 of administrative staff were filled up in six laboratories by recruitment. While IIP did not obtain approval of CSIR for filling up of vacant posts of 9 scientists, 23 technical and 16 administrative staff, CDRI and ITRC stated that approval of CSIR was not traceable in their record.

2.1.9 Promotions

(a) Grant of unwarranted benefits to S&T staff

Prior to introduction, in 1966, of bye-law 71 (b) regarding assessment promotion of scientists and technologists working in the specified four grades after completion of five year's service, CSIR followed the restricted merit promotion/ advance increment scheme of the Government and later technical staff was also covered in June 1975. Subsequently, CSIR notified New Recruitment and Assessment Scheme (NRAS), Merit and Normal Assessment Scheme (MANAS) and Revised MANAS in November 1981, September 1990 and August 1994 respectively. A review of the promotion

schemes formulated by CSIR and the promotions effected thereunder revealed some irregularities as discussed below:

All promotion schemes for S&T staff were implemented retrospectively

(i) NRAS, MANAS and Revised MANAS schemes notified in November 1981, September 1990 and August 1994, were implemented retrospectively from February 1981, April 1988 and April 1992 respectively.

(ii) Though *in situ* promotions to S&T staff did not involve assumption of higher duties and responsibilities of greater importance, CSIR uniformly allowed the benefit of one additional increment for pay fixation, in contravention of Fundamental Rules.

CSIR's response in October 1997 that its GB had approved this practice in 1996 was not tenable as the latter was not empowered to relax the provisions of Fundamental Rules.

The benefits of additional increment on pay fixation on promotion and advance increments were allowed simultaneously

(iii) Under NRAS, CSIR followed the practice of granting advance increments in exceptionally meritorious cases on the recommendation of assessment committee. Ignoring the merit criteria, CSIR granted two additional increments uniformly to certain categories of scientists promoted between October 1978 and February 1981. Despite MOF pointing out that both the benefits of additional increment on pay fixation as well as advance increments could not be given simultaneously, CSIR decided not to recover the excess amounts paid in all such cases.

(b) Reclassification of non-technical posts as technical

Besides technical and supporting staff, non - R&D posts like Compounders, Nursing Sisters, *Malis*, Artists, Tailoring Assistants and Translators etc. were also classified as technical merely to confer benefits of assessment promotion and higher retirement age

Apart from extending the benefit of assessment promotions - originally meant for scientific personnel - to technical staff in 1975, CSIR also reclassified supporting staff in Group I and II as technical while notifying NRAS in November 1981. Subsequently, in December 1982, CSIR categorised a number of non-R&D posts like Compounders, Nursing Sisters, *Malis*, Artists, Tailoring Assistants, Sales & Advertisement Assistants, Packers, Translators/ Translating Officer, Assistant Information Officer (Hindi), etc. also as technical, retrospectively from October 1978, to extend them the benefits of time bound assessment promotion and

higher retirement age. While classifying the posts of Engineers, Draftsmen, Architects etc. as technical ones, CSIR ignored the decision taken by GB in October 1978 to treat them as administrative posts.

In the context of a reference made by CSIR, MOF in August 1988 clarified, with the approval of Minister of State for Finance, *inter alia*, that the assessment promotion scheme similar to the Flexible Complementing Scheme (FCS) was applicable to scientists engaged in scientific research and the scope of the scheme could not be enlarged to cover other posts and that mere scientific qualification did not make a post/person eligible for a higher scale of pay and the benefits of FCS. While extending the benefit of identical service conditions and pay scales including FCS to all its technical staff classified in Group I, II, III and V in the past, CSIR did not obtain prior approval of the MOF and/ or the Department of Personnel and Training (DOPT). GB of CSIR decided, in November 1992, that it would not be administratively feasible to withdraw the benefit from existing incumbents but the new inductees of the designations like Documentation/ Translation/ Patent Officers would neither be covered under the FCS nor granted higher pay scales applicable to the scientists. Nothing was, however, done in regard to other staff who were allowed the benefit of FCS and identical service conditions as applicable to scientists engaged in active research, in spite of the clarification given by MOF. Accordingly, engineering, technical and supporting staff, numbering 12807, as per sanctioned strength fixed in September 1995, continued to enjoy the benefits of assessment promotion schemes and higher retirement age, in disregard to the Government's policy on the subject.

CSIR stated, in October 1997, that the recruitment and promotion of its staff was regulated in accordance with detailed schemes approved by the GB in this behalf as provided in the bye-law 11 and no separate approval from the MOF etc. was needed. The contention of CSIR was not correct as the benefits of FCS were extended by them to ineligible categories of staff even before introduction of bye-law 11 in July 1989. It was further noticed that bye-law 11 merely provided for formulation of schemes for recruitment and promotion and did not confer absolute power on GB for approval of such scheme for all categories. The erstwhile CSIR Rule 46

also required sanction of the Government of India (GOI), *inter alia*, to frame, amend or repeal bye-laws concerning service conditions of the CSIR staff. In fact, while vetting the amendments to bye-laws of CSIR, proposed in November 1973, MOF had specifically directed CSIR to make the following provision:

Directives of MOF to make specific provisions for staff in CSIR by-laws ignored

"Recruitment, appointments, promotions and transfers to all posts shall be made in accordance with the rules and orders similar to those obtaining in the GOI for corresponding posts".

However, CSIR did not include the aforesaid provision in their bye-laws and thereby defied the directive of MOF. As GOI provide budgetary support to CSIR, there was no justification for CSIR not to conform to the provisions applicable to similarly placed government servants.

(c) Other irregularities relating to promotions

Other irregularities noticed in implementing the promotion schemes were as under:

Promotions to higher grades were allowed retrospectively defeating the very purpose of the scheme

(i) Even though NRAS was notified in November 1981, all employees who had completed the prescribed period of service upto January 1981 were promoted in one lot from 1 February 1981 subject to percentage ceiling. The remaining employees, who failed to secure promotion due to the aforesaid ceiling, were also promoted to the next higher grade in September 1983 with retrospective effect from 1 February 1981 itself defeating the very purpose of assessment scheme and/ or percentage limits.

(ii) M.A. degree in subjects like Economics and Geography, M.Com. degree and a two year course of Diploma in Business Management with one year course of Master of Management Science were treated as equivalent to M.Sc. degree i.e. entry level qualification prescribed for scientists, to enable holders of such qualifications to get promoted to scientists' grade.

(iii) Revised MANAS provided for assessment promotion of all employees in position on 31 December 1981 and possessing entry level qualification for the next Group, to the next higher grade two years earlier than the prescribed period of assessment. The employees due for such assessment from earlier dates were allowed notional benefit from such dates with actual financial benefit from 25 September 1990. The cut-off date of 31 December 1981 was removed arbitrarily through an order issued in May 1996 to provide the benefit uniformly to all.

(iv) Test-check of personal records of a few S&T staff in CSIR headquarters revealed that liberalisation of policies and *ad hoc* decisions, as discussed above, conferred faster promotions on S&T staff, as shown in Appendix XII. Since benefits of aforesaid nature are neither provided for in the Government rules and orders nor CSIR obtained prior approval of the MOF and/or DOPT, it exceeded its powers in granting undue benefits to its staff. In fact, MOF had specifically advised CSIR in 1973 to provide for, in its bye-laws, stipulations regarding applicability of the rules and orders obtaining in GOI to its staff in respect of all recruitment and promotions etc. MOF also issued orders in August 1984/ May 1987 that the terms and conditions of service of the employees of all autonomous S&T organisations partly or fully funded by GOI would be generally similar to those applicable to Central Government employees.

(d) Retrospective benefit of promotions

All the 1667 S&T staff promoted in six laboratories and CSIR headquarters during 1992-97 were given the benefit of promotion retrospectively for periods ranging upto more than five years

Test-check of records revealed that in all the 1667 cases of promotions in scientific and technical cadres during 1992-97 in six laboratories and CSIR headquarters, the benefit of promotion was allowed retrospectively for periods ranging upto more than five years, as shown in Appendix XIII. CSIR stated, in August 1997, that according to their assessment scheme, promotion took effect from the due date of eligibility. However, the fact remained that the Fundamental Rules, though applicable to CSIR staff, were violated at will providing retrospective benefit of promotions, without approval of the schemes by the MOF and DOPT.

(e) *Enhancement of promotional avenues for the administrative staff by creation/upgradation of posts*

The frequent cadre reviews and creation/upgradation of posts resorted to by CSIR, rather than being based on need, appeared to be guided by the objective of bringing administrative staff at par with S&T staff as discussed below:

(i) Scales of Section Officers and Assistants in Finance and Accounts stream were upgraded by CSIR, in November 1981, contrary to the orders of MOF prohibiting Ministries/ Departments to upgrade the scales of existing posts. The action of CSIR was, therefore, irregular.

(ii) CSIR, with a view to extend promotional avenues comparable to the S&T staff, including Class-IV and lower categories of technical staff, under NRAS, to administrative staff as well, carried out a cadre review in August 1987 and created 254 new (additional) posts and upgraded 743 posts which were estimated to cost roughly Rs.47.63 lakh. Through another cadre review approved in September 1990, which covered the posts upto the level of Section Officer, it created 24 new (additional) posts and upgraded 609 posts at various levels. Third cadre review based on the number of years of service was carried out in October 1994 to remove stagnation upto the grade of Section Officer resulting in upgradation of 388 posts. A total of 2018 posts were created/upgraded during the cadre reviews. Yet another cadre review was initiated in November 1996.

CSIR created 278 new (additional) posts and upgraded 1740 posts through successive cadre reviews to provide promotional avenues comparable to S&T staff to its administrative staff, without approval of the Finance Minister, though required

(iii) GOI orders place upgradation of posts at par with creation of higher post which require such proposals to be submitted to the Finance Minister, who may, depending upon the magnitude of financial implications, seek Cabinet's approval for the same. CSIR, however, did not obtain approval of the Finance Minister for creation and upgradation of posts in respect of any of the cadre reviews undertaken during August 1987 to October 1994 even though the Member (Finance) emphasised in May 1990 that the cadre review should have been done mainly on the basis of functional justification for creation/ upgradation of the posts and proposal should be processed in accordance with the MOF instructions.

Significantly, GOI had imposed ban on creation of posts in January 1984, which was applicable to both Plan and Non-Plan posts, as a part of anti-inflationary measures. Accordingly, creation/ upgradation of posts to provide more promotional avenues was not only irregular, but was in defiance of Government's policy of economy in expenditure.

Promotions arising out of cadre review were made retrospectively ignoring advice of Member (Finance)

All promotions arising out of the cadre review of October 1990 were made effective from April 1990 despite the observation of Member (Finance) that the promotions should be effective from the date of notification. Likewise, the benefit of promotions arising out of the subsequent cadre review of October 1994 was allowed notionally from April 1994, apparently to allow advancement of the subsequent promotions, available after a certain number of years, by six months.

CSIR admitted, in October 1995, that the cadre reviews carried out since 1987 to remove stagnation in the administrative cadres had resulted in inversion of pyramid as there had been upgradation of posts without any increase in the overall strength resulting in drying up of feeder grades besides hierarchical problems and increasing difficulties in filling up of vacancies in higher grades. This would be evident from the details of the total number of posts in each category before and after the cadre reviews, including scattered creation/ upgradation of posts apart from the cadre reviews, as given in Appendix XIV. The speedy promotions caused by the frequent cadre reviews resulted in 10 Matriculates/ Intermediates holding the posts of Deputy Secretary/ Controller of Administration and another six Matriculates/ Intermediates holding the posts of Under Secretary/ Administrative Officer as of April 1996.

(f) Irregular grant of higher pay scales resulting in avoidable expenditure of more than Rs.468.04 lakh

Government of India revised, in July 1990, the pay scales of Assistants and Grade 'C' Stenographers of Central Secretariat Service (CSS) from Rs.1400-2600 to Rs.1640-2900 with effect from 1 January 1986. Though it was clarified in January 1991 that the orders did not cover equivalent posts in autonomous bodies, CSIR sent a draft Cabinet Note incorporating the proposal for adoption of higher scale of Rs.1640-2900 for Assistants and

Pay scales of the Assistants, Senior Stenographers, Assistants (Finance and Accounts) and Stores and Purchase Assistants (Grade-III) were revised from Rs.1400-2600 to Rs.1640-2900 in defiance of the clear directives of the MOF and DOPT, at a cost of more than Rs.468.04 lakh

Senior Stenographers in CSIR to DOPT and MOF, in June 1994, for comments. Though the proposal was turned down by DOPT as well as Finance Minister and Member (Finance), CSIR adopted the higher scale in June 1995. The financial implication of the decision for the period from 1 January 1986 to 31 March 1997 worked out to Rs.468.04 lakh. CSIR, ignoring the dissent of Member (Finance), again decided in November 1995 to grant higher pay scale of Rs.1640-2900 also to the Assistants (Finance & Accounts) from 1 January 1986 and Stores and Purchase Assistants (Grade III) from 1 May 1987. Grant of higher scale of pay to CSIR staff numbering 1959 ignoring the dissent of Member (Finance) and directives of DOPT and MOF was irregular.

(g) Induction of non-technical staff into technical stream

Administrative staff were inducted into technical stream ignoring entry level academic and technical qualifications to provide them benefits of faster promotion and higher retirement age. Of the 74 employees inducted in six laboratories, 53 did not possess the prescribed qualifications

Between January 1982 and June 1990, CSIR introduced various schemes for induction of non-gazetted administrative staff into technical stream to provide them the benefit of better promotional avenues and higher retirement age, as applicable to S&T staff. Instead of insisting on the entry level academic and technical qualification and experience prescribed for direct recruitment to technical posts, the schemes provided for short term in-house training for Group 'D' staff/ drivers and six months in-house/out-source training in areas of computerisation, office automation etc. for other employees not possessing technical qualification. The requirement of availability of a vacancy in the technical grade was dispensed with in June 1990 allowing the concerned inductee to carry his own post till his superannuation/resignation etc. thereby ignoring the sanctity of cadre-wise sanctioned strength. The concept of need based induction in the area in which the vacancy was actually required to be filled came into existence only in April 1994 when it was decided that induction should be done against an available vacancy in technical grade and in the area in which the vacancy was required to be filled.

Of the 74 administrative staff inducted in technical stream in the six laboratories, 53 did not have the technical qualification and experience prescribed for direct recruitment. One peon and four drivers in IIP were inducted into technical stream from dates much before the approval of the

schemes by CSIR. Though as per CSIR's clarification to a laboratory in August 1995, induction was to take effect from the date of taking over charge of the technical post, in 26 cases of induction during June 1990 to March 1997, benefit of induction was allowed retrospectively.

Five Assistants were inducted close to their retirement date and three of them without the prescribed period of training. One Assistant had to be inducted after actual retirement in compliance of a court's verdict against CSIR because of anomalies in CSIR policies. One Assistant in IIP was inducted as Senior Library Assistant in technical cadre after crossing the prescribed age limit even though the Library already had five Assistants and it had categorically denied any requirement of additional Assistant. One Senior Stenographer in NPL, who had not even applied for the prescribed computer training was awarded certificate of computer training and on the basis of such certificate she was inducted to the post of Senior Mechanical Assistant in Group II. She took over charge of the technical post in November 1996 but was allowed the benefit from January 1996. Significantly, even thereafter she continued to work in her earlier capacity of Senior Stenographer while enjoying the benefits of the technical post.

2.1.10 Research activities and under-utilisation of scientific manpower

An attempt in Audit to correlate the progress of projects undertaken/completed during Fifth to Eighth Five Year Plans period with the manpower deployed thereon could not succeed as none of the six laboratories supplied Plan-wise details of the in-house and sponsored projects undertaken and their cost. However, the results of the research activities carried out in six laboratories during 1992-97 were as under :

Name of laboratory	1992-93			1993-94			1994-95			1995-96			1996-97		
	SIP	TD	SP	SIP	TD	SP	SIP	TD	SP	SIP	TD	SP	SIP	TD	SP
CBRI	185	NS	28	180	NS	34	173	NS	35	169	NS	40	166	NS	20
CDRI	217	3	159	201	2	135	200	3	141	191	4	146	190	2	85
IIP	178	NS	34	177	NS	49	129	NS	40	154	NS	24	151	NS	50
ITRC	111	1	97	109	-	65	109	-	86	106	-	64	105	-	43
NPL	291	6	187	294	2	173	285	1	213	282	2	171	282	-	181
SERC	32	2	2	29	1	6	27	1	2	27	1	3	37	-	2
Total	1014	12	507	990	5	462	923	5	517	929	7	448	931	2	381

SIP - Scientist in Position
SP- Scientific papers published in journals
TD- Technologies developed
NS - Not supplied

CBRI and IIP did not supply year-wise details of technologies developed.

Impact Factor is a measure of the frequency with which an average article in a journal has been cited in a particular year. The impact of research work done by laboratories being insignificant was evident from the fact that 308 of the 666 scientific papers of CDRI, 46 of the 197 scientific papers of IIP, 248 of the 355 scientific papers of ITRC and all the 15 scientific papers of SERC were published in journals of little consequence, which were not even reckoned for the purpose of determining impact factor by the scientific community.

271 Scientists in six laboratories did not contribute any research paper during 1992-97. Only one technology was developed by ITRC, with a strength of 108 scientists, on an average basis, during 1992-97

The number of scientists who did not contribute any research paper during 1992-97 worked out to 59, 21, 78, 17, 86 and 10 in respect of CBRI, CDRI, IIP, ITRC, NPL and SERC respectively. Besides, only one research paper was contributed during this period by each of the 19 scientists in CBRI, 12 scientists in CDRI, 6 scientists in IIP, 8 scientists in ITRC, 35 scientists in NPL, 8 scientists in SERC and only two research papers by each of the 12 scientists in CBRI, 22 scientists in CDRI, 10 scientists in IIP, 7 scientists in ITRC, 37 scientists in NPL and 3 scientists in SERC. ITRC developed only one technology, with an average strength of 108 scientists during 1992-97.

2.1.11 Other points of interest

77 surplus staff were adjusted in laboratories having no vacancy/ requirement for additional staff

(i) Consequent upon re-transfer of the Drug Farms and Factories, Srinagar a sub-unit of Central Institute of Medicinal and Aromatic Plants (CIMAP) to the Jammu and Kashmir Government by CSIR in August 1983, out of the 210 employees rendered surplus, 19 were transferred to the State Government. Of the remaining 191 employees, who opted for the service of CSIR, 38 were retained for R&D unit of CIMAP at Srinagar. In September 1983, CSIR accommodated Class III and IV employees in Jammu and Srinagar and the others at the laboratories nearest to the stations of their choice. Accordingly, all 153 employees were adjusted in 27 laboratories and CSIR headquarters upto November 1983 by creation of supernumerary posts for the purpose. Of these, 38 employees were adjusted in five laboratories which had already expressed their inability to absorb the surplus staff due to non-suitability of such employees. Besides,

of the 42 employees absorbed in Regional Research Laboratory (RRL) Jammu, 39 were absorbed without there being any post to accommodate them. Whether suitable vacancies for the remaining 76 employees in 21 laboratories existed could neither be ascertained from records nor confirmed by CSIR.

Of the 119 temporary employees of a closed project, 69 were absorbed in laboratories without specific requirement

In a similar case, a demonstration-cum-semi-commercial plant, commissioned in 1972 for production of magnesium, was closed in December 1987 by National Metallurgical Laboratory (NML) due to its failure to make it economically viable. This resulted in 119 project employees alongwith 26 casual workers becoming surplus. Although these project employees were recruited temporarily against posts sanctioned on year to year basis, the entire surplus staff was absorbed in 22 laboratories by April 1990 including 24 employees in nine laboratories which had categorically refused to absorb them. One laboratory, which agreed to accommodate nine employees, had to absorb 32 men, clearly showing that there was no work for 23 persons. Additional 22 men were accommodated by NML itself. In all 69 employees were absorbed in laboratories without specific requirement of additional manpower. The action of NML in establishing a regular production unit was wrong as the bye-laws of CSIR do not envisage running of commercial plants by its laboratories. The erroneous action resulted in absorption of 119 men in different laboratories ; 69 out of them had no specific work to perform. This reflected CSIR's inability to enforce its own bye-laws, besides binding the exchequer with financial burden of permanent nature without justification.

Thus, a total of 310 employees rendered surplus due to closure of these two units were adjusted in various laboratories and CSIR headquarters, irrespective of availability of vacancies and/ or suitability of the staff so adjusted in the concerned laboratory.

(ii) Consequent upon closure of the Lucknow based Service and Maintenance Centre of Central Scientific Instruments Organisation, Chandigarh due to demand from the students for vacating the premises of

Lucknow Polytechnic, ITRC decided to take over the complement of three scientists, seven technicians and two administrative personnel with the approval of CSIR in December 1987. Neither CSIR sought justification for such additional staff nor did ITRC care to explain the reasons for the same.

(iii) While relocating SERC from CBRI campus at Roorkee to Ghaziabad, CSIR initially decided, in May 1984, not to transfer low-paid staff to Ghaziabad without their consent. However, due to staff agitation, CSIR decided to give option to all the employees of SERC to opt for either of the laboratories. On the basis of the options received, 15 scientists, 49 technicians and 28 administrative personnel were transferred in December 1988 to CBRI without there being any specific requirement, leaving 20 scientific, 20 technical and 13 administrative personnel for SERC, Ghaziabad. While CSIR had to sanction additional posts at CBRI to accommodate the staff so transferred, the shortage of manpower and resultant operational problems at SERC, Ghaziabad figured in the peer group review meeting which identified an immediate requirement of 32 scientific, 20 technical and 15 administrative personnel.

SERC transferred 15 scientific, 49 technical and 28 administrative staff to CBRI to avoid dislocation to staff

(iv) After the implementation of MANAS, CSIR dispensed with the concept of designations for S&T posts. Various categories of staff were placed in Groups I to V. Only the number of grades within a Group was specified without assigning any job description to the various grades. In the absence of job descriptions attached to posts at various levels in the hierarchy, the possibility of confusion in the nature of duties and responsibilities attached to each post was inherent in the scheme. On assessment promotion, members of staff carried their own posts to the higher grades. There was no linkage between the need based requirement for a particular job/work and the availability of a post/person with qualification required to perform the duties attached thereto. As a result, CSIR and its laboratories were unable to identify the number of persons required/available for doing job of a particular description nor could they specify job description of each category of technical and support staff. CSIR did not clarify the reasons for dispensing with the system of designation and job descriptions.

(v) Based on the recommendations of a committee, Research Council of CBRI approved in December 1994, closure of the four extension centres located at Ahmedabad, Bhopal, Calcutta and Thiruvananthapuram. However, only one of the four centres could be closed in February 1997. Expenditure on salaries of 15 persons deployed at these centres during 1995-96 and 1996-97 worked out to Rs.29.32 lakh which was unfruitful.

2.1.12 Lack of management information system

CSIR failed to evolve an effective management information system for the efficient functioning of manpower operations

CSIR is a very large organisation managing 41 national laboratories having a regular staff component of around 23350 personnel but it failed to evolve any Management Information System (MIS) for efficient control over its manpower. As a result, it was unable to track the information relating to category-wise details of sanctioned and working strength, additional posts sanctioned/filled up during a particular period, promotions, transfers, induction of non-technical personnel to technical cadre, supernumerary posts sanctioned/operated, adjustment of staff rendered surplus, engagement of casual workers for regular nature of work/sponsored projects etc. No periodical returns to have control over various manpower parameters were prescribed by CSIR headquarters for its laboratories and the units at headquarters. As a result, every time such information was called for in Audit, CSIR intimated that the required information was not available with them and the same would be called for from the laboratories. Thus, CSIR headquarters had abdicated its responsibility of maintaining particulars of sanctioned posts in various grades in its constituent laboratories and, in the absence of any MIS in this regard, created a situation whereby manipulation in the sanctioned strength of various laboratories could remain undetected and some of the laboratories even operated posts in excess of their sanctioned strength.

To sum up, even after five decades of its existence, CSIR failed to evolve standard norms for assessment of its manpower requirement. Laboratories were not only operating posts in excess of their sanctioned strength, they were also engaging additional manpower through contractors. In IIP, about 30 *per cent* of the persons employed irregularly through the contractor

were close relatives of its own employees. Non-scientific staff were given undue benefits of time bound assessment promotions and higher retirement age, though these were meant only for scientific staff. CSIR carried out cadre reviews of the administrative staff thrice during 1987-1994, creating 278 new (additional) posts and upgrading 1740 posts to next higher grades in violation of Government's orders. The promotions were made with retrospective effect. This also resulted in disproportionate large number of non-scientific personnel in its laboratories in relation to the scientific manpower. CSIR granted higher pay scale of Rs.1640-2900 to four categories of its administrative staff irregularly. The expenditure on overtime allowance increased from Rs.81.57 lakh in 1992-93 to Rs.151.56 lakh in 1996-97. While deployment of scientific and technical manpower for non- R&D works was common, in some cases non-qualified staff were deployed for scientific works. While the output on R&D activities of scientific manpower was dismal, the expenditure on manpower rose from 41 *per cent* of its total expenditure during the Fifth Plan to 51 *per cent* in the Eighth Plan. CSIR lacked an effective management information system for the efficient control of manpower operations.

The matter was referred to CSIR in October 1997 ; their reply was awaited as of January 1998.

2.2 Regional Research Laboratory, Bhubaneswar

2.2.1. Introduction

Regional Research Laboratory (RRL), Bhubaneswar was established in 1964 to put to effective use the mineral, forest, marine and agricultural resources of the region by providing scientific and technological inputs in these fields.

2.2.2. Scope of Audit

Audit of RRL was conducted in April - June 1997. The present review is based on test check in Audit of transactions of RRL, pertaining to the period 1992-93 to 1996-97.

2.2.3. Organisational set up

RRL is headed by a Director who is assisted by a Research Council and a Management Council.

The Research Council is to advise and recommend on the formulation of research programmes, conduct periodic reviews of research activities, assess progress of projects and advise on fostering linkages between RRL and other research organisations, industry and potential clients. There is also an internal committee called the Research Appraisal and Review Committee (RARC) which assists the Director in Research and Development matters concerning introduction of new projects and categorisation of externally funded projects. Management Council is responsible for managing the day to day affairs of RRL.

2.2.4. Highlights

- **RRL did not maintain project folders for facilitating evaluation of individual projects though a Planning, Monitoring and Evaluation Cell was set up for this purpose in July 1990. Research Council's meetings were not effective as, out of its nine meetings held during 1992-97, projects were not reviewed in eight meetings. Foreclosure of three in-house projects during June 1993 to June 1994 resulted in an unproductive expenditure of Rs.1.62 crore. Lack of proper planning resulted in findings of three completed projects remaining within the laboratory as there were no takers. Thus expenditure of Rs.74 lakh on these three projects could not result in any applied benefit.**

  (Para 2.2.6)

- **Objectives set out for two grants-in-aid projects costing Rs.11.78 lakh, could not be achieved, rendering the expenditure unproductive. The extent of usefulness and utilisation of the findings to the end users were also not**

available in respect of all the 17 grants-in-aid projects costing Rs.1.60 crore completed during 1992-97.

(Para 2.2.7)

- Not even a single technology/know-how was developed after March 1992, though 131 scientists and 144 technicians were working in the laboratory. Out of 35 technologies/know-how developed upto 1991-92, only 19 were released to the industry.

(Para 2.2.8)

- Scientific publications highlighting research findings were brought out for only 41 projects out of 82 projects completed during 1992-97.

(Para 2.2.9)

- No patent was obtained against the result of researches conducted after 1988.

(Para 2.2.10)

- A sub-merged arc smelting furnace valued at Rs.14.28 lakh was lying unutilised for more than six years after its procurement in February 1991 due to its high running cost. Stores worth Rs.2.43 crore procured during 1990-97, were not accounted for in stock ledgers.

(Para 2.2.11)

- Advances aggregating Rs.3.90 crore were outstanding against officials/private parties/ Government Departments for more than a year. Equipment/apparatus valued at Rs.2.73 crore received from Germany free of cost, were not accounted for in the stock register.

(Para 2.2.13)

- Non investment of surplus funds resulted in loss of interest of Rs.51.94 lakh

(Para 2.2.15)

2.2.5. *Receipt and expenditure*

RRL is financed mainly by funds provided by CSIR. Receipts and expenditure of RRL for 1992-93 to 1996-97, other than on sponsored projects, were as under:

(Rupees in lakh)

Year	Funds from CSIR	Misc. receipts	Total receipts	Expenditure		Total Expen-diture	Savings
				Capital	Revenue		
1992-93	390.00	7.99	397.99	66.92	304.67	371.59	26.40
1993-94	556.00	9.90	565.90	86.55	349.64	436.19	129.71
1994-95	571.00	10.12	581.12	88.14	395.85	483.99	97.13
1995-96	551.00	14.88	565.88	87.85	457.63	545.48	20.40
1996-97	816.00	19.21	835.21	153.45	540.91	694.36	140.85

Excess funds released by CSIR

It would be seen from the above that the total expenditure was less than the funds received from CSIR during 1992-97, which indicated release of funds by CSIR in excess of RRL's requirement. The laboratory stated, in May 1997, that the surplus funds at the close of the years were utilised to meet the expenditure on centrally operated heads during the initial months of the succeeding years. The contention was not tenable as the surplus funds were considerably high in comparison to the revenue expenditure for the years 1993-94, 1994-95 and 1996-97.

2.2.6. *Research activities*

R&D activities of RRL are conducted through in-house, grants-in-aid, sponsored and consultancy projects.

Project Planning, Monitoring and Evaluation

Project folders with required details not maintained

RRL set up a Planning, Monitoring and Evaluation (PME) cell in July 1990 for budgeting and costing of projects and maintenance of project folders with all relevant details, including recommendations of Internal Committee and Research Council. PME cell, however, did not maintain project folders. The estimated budget *vis-à-vis* actual expenditure on each in-house project could not, therefore, be ascertained in Audit.

RRL stated, in May 1997, that due to lack of adequate staff, the project budgeting and cost accounting could not be implemented. The reply was not tenable because CSIR guidelines provided for redeployment of staff from within the laboratory.

Inadequate monitoring of projects

Audit scrutiny of minutes of the Research Council meetings held during 1992-97 disclosed that project review and assessment of individual projects were not conducted by Research Council in eight out of nine such meetings. As a result, project leaders/scientists were deprived of suggestions/recommendations of Research Council and all the projects continued without any appraisal of their progress. Follow up action on decisions/recommendations of the Research Council were not reflected in minutes of subsequent meetings. As a result, it was not ascertainable as to whether and how far the activities of RRL during that period were monitored by the Research Council. In December 1992, Research Council had advised that RRL scientists should be very strict about time management and its Secretary was asked to prepare the agenda for the next meetings of the Research Council highlighting the aspect of time management for each project. Scrutiny of agenda for the subsequent meetings of Research Council revealed that its directions were not complied with. In May 1997, RRL stated that it was just a general comment of Research Council on completion of the projects as per schedule. The reply was not tenable because non-compliance of the directions of Research Council renders the peer review ineffective.

In-house projects

Number of patents filed and papers published were insignificant

In-house projects are undertaken as core activities of the laboratory and are financed from the funds received from CSIR. RRL had 30 ongoing projects at the beginning of 1992-93. It undertook 70 research projects during 1992-97. 82 projects were completed/closed or kept in abeyance during this period leaving 18 ongoing projects as on 31 March 1997. These 82 projects resulted in the filing of only 13 patents and only 41 research papers were found worthy of publication in science journals. RRL stated, in May 1997, that most of the projects were of short duration and conceded the fact that the number of patents and publications were not significant.

Documents relating to 25 in-house projects were scrutinised in Audit. Some illustrations where projects had to be closed because of lack of planning were as given below:

(a) Foreclosure of in-house projects

Three projects had to be closed before completion rendering the expenditure of Rs.1.62 crore unproductive.

(i) Preparation of 19 - Nor Steroid drugs from 16 - DPA

Project foreclosed after spending Rs.60.70 lakh

RRL undertook a project in April 1987 on preparation of "19-Nor-steroid drugs from 16 - DPA" with scheduled date of completion as March 1990. The proposed activity included collection of literature and testing of different methods for the preparation of 19-Nor steroid moiety. RRL also proposed in April 1990 to develop in the same project the process know-how on laboratory scale for preparation of certain drugs like Nandrolone, Norethisterone, Mifepristone etc. The latter project was scheduled to be completed in March 1996 at an estimated cost of Rs.77.60 lakh. In December 1992, RRL started negotiations with Indian Institute of Chemical Technology (IICT), Hyderabad for funding a part of the project. RRL sent a project proposal to IICT in March 1993 for funding. But, IICT did not respond subsequently. Though the project reached upto 19 - Nor moiety preparation stage, RRL decided, in January 1994, to keep the project in abeyance as no sponsorship had been received.

Thus, the decision of RRL to foreclose the project prematurely rendered the expenditure of about Rs.60.70 lakh incurred on the project ineffective.

(ii) Development of catalysts

Project costing Rs.63.50 lakh foreclosed for want of required gas

In January 1986, RRL undertook a project on "Development of catalysts" with scheduled date of completion as January 1988. The scope of the project was subsequently enlarged to 'Development of catalysts for oxidative dimerisation of methane, propylene oxidation, emission control and regeneration and recovery of spent catalysts'. The project, estimated to cost Rs.133 lakh, was expected to result in import substitution and

export promotion by 1997. The work on the project received a setback in 1993 and was closed prematurely in June 1994 due to non-procurement of methane gas. RRL stated, in May 1997, that methane gas was not procured for want of funds. The reply was not tenable since RRL had a balance of Rs.276.85 lakh at the end of 1994-95. Thus, due to RRL's failure in procuring the required methane gas, the expenditure of Rs.63.50 lakh incurred upto June 1994 on the project was rendered unproductive.

(iii) Synthesis and characterisation of ternary and quaternary compounds

Project costing Rs.37.50 lakh abandoned on plea of not having funds

A project on "Synthesis and characterisation of ternary and quaternary compounds" was undertaken in July 1990 without ensuring facilities of measurement of luminescence spectra and determining pigment characteristics for the perovskite structured compounds. The objective of the project was to develop technology for luminescence paint. As stated by RRL in May 1997, the required facilities mentioned above could not be arranged due to non-availability of enough funds and, therefore, it had to abandon the project in August 1993 after incurring an expenditure of Rs.37.50 lakh. The reply was not tenable because the annual accounts of RRL as on 31 March 1993 revealed a closing balance of Rs.96.64 lakh.

Even after spending Rs.1.62 crore, the three in-house projects failed to achieve the intended objectives.

(b) Lack of impact assessment

(i) Utilisation of phosphatic dolomitic rock

Project costing Rs.21 lakh did not find any sponsor for its upscaling

In April 1991, RRL undertook a project on "Utilisation of phosphatic dolomitic rock" at an estimated cost of Rs.21 lakh. The objective of the project was to evolve a process for utilisation of dolomitic phosphatic rock of Rajasthan. After conducting laboratory scale studies, Research Appraisal and Review Committee decided in May 1993 to keep the project in abeyance until a sponsor was found for upscaling the know-how from laboratory scale. RRL had not got a sponsor as of November 1997. In the absence of any taker of the process developed by RRL at a cost of Rs.21 lakh, the project failed to deliver the intended objectives.

(ii) Physico-chemical treatment of contaminated soils, solids and effluents of Orissa

Impact of completed project costing Rs.31 lakh not known

In April 1991, RRL took up an in- house project on "Physico-chemical treatment of contaminated soils, solids and effluents of Orissa" at an estimated cost of Rs.31 lakh. The objectives of the project were to survey different mines in Orissa, collect water samples and identify physico-chemical and biological treatment which would help in controlling the pollution arising from mining operations. The project was completed in March 1993 and RRL sent the report alongwith the recommendations to the respective mine owners whose mines were studied but did not obtain any feedback from them. As such, RRL was unaware about how far the result of the project and the recommendations thereon were helpful to the mine owners.

Thus, the result of the environmental study made by RRL spending Rs.31 lakh had remained unknown to the laboratory.

(iii) Development of slurry jet pump

Inadequate follow up to find sponsor for upscaling of process developed by spending Rs.21.50 lakh

RRL undertook a project in July 1991, for 'Development of slurry jet pump' and completed the laboratory scale studies in December 1993 after incurring an expenditure of about Rs.21.50 lakh. RRL could contact just one organisation till May 1997 for getting sponsorship for upscaling of the process which turned down the proposal. RRL had not found a sponsor as of November 1997. Lack of planning in tying-up sponsor for the project, resulted in the project remaining confined within the laboratory only.

2.2.7 Grants-in-aid projects

Grants-in-aid projects are funded by Government departments/agencies. RRL had eight grants-in-aid projects in hand as on 31 March 1992. It took up 44 new projects during 1992-97 and completed 17 projects costing Rs.1.60 crore during this period. The extent of usefulness and utilisation of the findings to the end users were not available in respect of any of the 17 completed projects. Test check of 10 completed projects revealed shortfall in achievements of objectives in two projects as under:

Partial work carried out at a cost of Rs.4.29 lakh on a project

(a) For undertaking a project on 'Assessment of pollution due to aluminium industry and its abatement' at an estimated cost of Rs.14.03 lakh, RRL sought funding from Ministry of Environment and Forest (MOEF). MOEF sanctioned Rs.4.58 lakh in March 1992 as total cost of the project for a period of three years. Notwithstanding the availability of a meagre amount of Rs.4.58 lakh as against the estimated cost of Rs.14.03 lakh, RRL started the project in April 1992 and closed the project in March 1996 after carrying out only a portion of the work at a cost of Rs.4.29 lakh. Though a report was sent to MOEF in April 1996, MOEF did not evince any interest in RRL's report. The expenditure of Rs.4.29 lakh proved wasteful.

Project closed after the process developed only upto laboratory scale at a cost of Rs.7.49 lakh

(b) Department of Science & Technology (DST) sanctioned Rs.7.95 lakh in May 1993, for a project titled "Recovery of magnesium from marine bittern as double salt and preparation of magnesia (Refractory grade)". The project was to be implemented within a period of 18 months. RRL could not start the project till August 1993 because funds were released in July 1993. By that time, the salt season was over. There was also delay in recruitment of project staff. In May 1995, RRL sought approval of DST for extension of the project upto July 1996 and for an additional sanction of Rs.5.27 lakh for preparation of 1 kg and 5 kg batch of magnesia which was not included in the original proposal since RRL had apprehensions that DST might reject such a proposal. DST had not released the additional fund as of May 1997. After preparation of double salt and magnesia at laboratory scale (gram scale), RRL closed the project in July 1996 after incurring an expenditure of Rs.7.49 lakh.

Thus, due to RRL's failure to formulate a complete blue print of the project in its original proposal sent to DST, the process for recovery of magnesia at refractory grade was not developed even after spending Rs.7.49 lakh.

2.2.8 Utilisation of technology/know-how

No technology/ know-how developed after March 1992

RRL did not develop any technology/know-how out of the projects undertaken during the period 1992-97, though 131 scientists and 144 technicians had been working in RRL.

Prior to 1992-93, RRL had referred 35 technologies/know-how to National Research Development Council (NRDC) for release to industries. Of these, NRDC released 19 technologies/know-how to 35 industries upto 1996-97. Reasons for non-release of remaining 16 technologies/know-how to industries by NRDC was not known to RRL. It also did not know production details of the 19 technologies/know-how transferred during 1964-92 due to non-receipt of report from the industries.

The total amount of premia on transfer of technology/know-how received by RRL in 33 years since inception i.e. 1964-97 was a meagre Rs.0.83 lakh.

2.2.9 Publications

Details of papers published and scientists engaged during 1992-97 were as follows :

		1992-93	1993-94	1994-95	1995-96	1996-97
Research papers published	National Journals	43	28	29	50	38
	Foreign Journals	25	30	41	51	88
	Total	68	58	70	101	126
Scientists available		133	153	150	146	144

The average output of scientific publications worked out to 0.58 paper per scientist per annum during the last five years.

Of 82 in-house projects completed during 1992-97, scientific publications were brought out from only 41 projects. Low output of scientific papers reflected on the quality of work undertaken by RRL. In May 1997, RRL stated that most of the projects were of short duration and admitted that the data generated was not sufficient for publishing a paper in scientific journals.

During 1992-97, RRL presented 862 papers in Seminar/ Symposia/Proceedings. Research Council observed in March 1994 that there should be a balance between publications in Seminars/

Symposia/Proceedings and journals. In that context, Research Council felt that peer review of research papers was essential.

Peer review of research papers not done

Scrutiny of documents of RRL revealed that peer review of research papers was not conducted. In May 1997, RRL stated that research papers of their scientists were peer reviewed by Editorial Board of the particular journal/proceedings.

2.2.10 Patents

All such research works which result in the development of a new process of production can be patented if the conditions necessary for grant of patent are satisfied. The main criteria of a patentable invention is that it should be novel. The details of patents filed, sealed and commercialised during 1992-97 were as follows:

Particulars	1992-93	1993-94	1994-95	1995-96	1996-97
Number of patents filed	6	8	5	4	3
Number of patents sealed	1	1	5	-	-
Number of patents processed further/ commercialised	nil	nil	nil	nil	nil

Number of patents obtained was poor/nil

It was seen in Audit that all the seven patents which were sealed pertained to research activities conducted by RRL prior to 1988. No research finding in the post 1988 period had succeeded in obtaining patent till May 1997. Thus, commercialisation of its research work showed a dismal performance.

2.2.11 Purchase and Stores

(a) Sub-merged arc smelting furnace

Equipment worth Rs.14.28 lakh procured after completion of project

In February 1991, RRL procured one sub-merged arc smelting furnace at a cost of Rs.14.28 lakh for the Indo-German project "Agglomeration of orefines". Though the furnace was installed in October 1991, it was commissioned in May 1993 after completion of the project. On being pointed out vide para 12.3(1) of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1993, Union Government (Scientific Departments), CSIR stated, in October 1995, in the Action

Taken Note that RRL was making efforts to generate externally funded programmes for utilising the facility.

Till May 1997, RRL was neither able to generate externally funded programmes contemplating use of the furnace nor did it utilise the same for its in-house purposes in view of high running cost. The project for which the equipment had been imported was completed without its use and the furnace was lying idle for more than six years, since its procurement in February 1991. Thus, the equipment was not really required and its procurement had rendered the expenditure of Rs.14.28 lakh wasteful.

(b) Demurrage and terminal charges

Demurrage of Rs.7.88 lakh paid in five years

In terms of CSIR instructions, RRL had to report to CSIR the expenditure on demurrage and terminal charges exceeding Rs.250. During 1992-97, RRL took 57 to 384 days for clearance of 64 consignments from the date of their receipt at the airport and paid demurrage of Rs.7.88 lakh. RRL did not report the matter to CSIR. RRL stated, in May 1997, that due to oversight, approval of CSIR was not obtained.

(c) Equipment/apparatus awaiting stock entry

Huge stores worth Rs.243.24 lakh lying without stock entry

Test check of Daily Receipt Register revealed that 1248 different kinds of stores worth Rs.243.24 lakh purchased during 1990-97, both from foreign and indigenous sources, remained unaccounted for in the store inventories since 1990. On being pointed out by Audit in May 1997, RRL stated that action would be taken and cross referencing done after making necessary entries in the stock ledger.

(d) Purchase without inviting tenders/quotations

GFRs provide that purchases of articles or group of articles upto Rs.500 on each occasion may be made without inviting quotations. During 1992-97, RRL purchased 500 different items each ranging from Rs.1000 to Rs.2,04,646 with total cost of Rs.30.38 lakh without inviting tenders/quotations.

2.2.12 *Physical verification of stores*

No physical verification of stores after 1986-87

Physical verification of the stores is required to be done every year. It was, however, observed that no physical verification was conducted after 1986-87 despite being pointed out by audit during earlier inspections. RRL stated, in May 1997, that attempts were made on several occasions to conduct complete physical verification but it did not materialise. The reply was not tenable as incomplete physical verification was a wasteful effort and absence of physical verification for the last 10 years could result in shortages/pilferage of stores.

2.2.13 *Accounts*

(a) Outstanding advances

As of 31 March 1997, advances to government officials, private parties, government departments/organisations etc. amounting to Rs.538.35 lakh were pending for adjustment/recovery, as detailed below:

(Rupees in lakh)

Year	Govt. Deptt.	Private Parties	Government officials (TA/LTC)	Contingent	Total
1971-92	55.705	72.954	2.101	2.935	133.695
1992-93	0.400	13.342	1.043	0.295	15.080
1993-94	3.502	48.635	0.421	0.373	52.931
1994-95	2.754	80.608	0.882	0.235	84.479
1995-96	2.437	95.863	1.567	3.541	103.408
1996-97	6.506	123.636	7.035	11.578	148.755
Total	71.304	435.038	13.049	18.957	538.348

Outstanding advances to the tune of Rs.389.59 lakh were more than one year old

Out of this, Rs.389.59 lakh were outstanding for more than one year. RRL stated, in May 1997, that it had resolved in a task force meeting held in April 1997 to bring down substantially the outstanding amount of advances.

(b) Assets

Assets Registers were not maintained

(i) RRL held assets valued at Rs.2235.28 lakh, as on 31 March 1996, but the asset registers were incomplete and did not add upto the said figure. The figures included in the balance sheet were also not reconciled

with the progressive totals of assets registers. The figures were arrived at by adding the acquisitions and subtracting the value of stores disposed of and written off. CSIR had decided, in November 1986, that Abstract Assets Register (AAR) would be maintained by RRL for reconciliation of the figure shown in the accounts with that of AAR. No AAR was, however, maintained. Thus, the balance of assets shown in the accounts could not be verified.

(ii) Non-accountal of stores and equipment acquired out of externally funded projects

Capital assets worth Rs.22.29 lakh not reflected in accounts

Expenditure incurred out of funds received for sponsored projects results in creation of capital assets. Such equipment remain the property of the sponsoring agencies unless they are gifted to RRL. In nine such projects completed between March 1993 and March 1996, RRL procured assets valued at Rs.22.29 lakh. RRL did not initiate any action till May 1997 for getting the equipment gifted, despite instructions of CSIR issued in October 1988 to that effect. This had resulted in the items not being taken in stores ledger of RRL and non-reflection of such assets in the accounts. RRL stated, in May 1997, that action would be taken to incorporate the stores/equipment in the main accounts after observing necessary formalities in this respect.

(iii) Understatement of assets

Non-accountal of assets worth Rs.272.74 lakh

During 1985-88, RRL received equipment and apparatus worth Rs.272.74 lakh free of cost from Federal Republic of Germany. As no issue slip and test report in respect of the stores were received from concerned divisions, RRL did not enter the same in the stock register. Thus, stores amounting to Rs.272.74 lakh remained outside the stock register since 1988. RRL stated, in May 1997, that concerned divisions were being reminded to submit required papers for effecting entries in the stock register. The reply was unsatisfactory because it contained no explanation for keeping the expensive apparatus and equipment out of their assets register. Moreover, non-accountal resulted in understatement of assets of RRL.

2.2.14 Bank reconciliation

Bank reconciliation for the period ended 31 March 1997 revealed following major discrepancies:

(i) In 172 cases pertaining to the period from December 1978 to March 1997, receipts totalling Rs.241.83 lakh were entered in the bank statement but did not appear in the cash book. Of these, 134 items aggregating Rs.18.46 lakh were more than one year old.

(ii) In 68 cases pertaining to the period from May 1979 to March 1997, receipts totalling Rs.51.46 lakh were entered in the cash book but did not appear in bank account. Of these, 49 items aggregating Rs.1.24 lakh were more than one year old. Non- crediting by bank of the amounts shown as receipt in cash book is fraught with the risk of embezzlement.

(iii) Rs.114.62 lakh involving 158 items for the period from May 1980 to March 1997 were debited to RRL account by the bank but corresponding entries were not available in cash book. Of these, 104 items involving Rs.72.30 lakh were more than one year old. Fraud/ embezzlements could not be ruled out in these cases.

(iv) RRL issued 87 cheques involving Rs.6.97 lakh pertaining to the period from December 1993 to December 1996 which were not presented for encashment and became time barred. Till March 1997, the time barred cheques had not been cancelled and taken into account.

2.2.15 Other points of interest

(a) Loss on electricity

RRL has its own campus in which the Laboratory and the staff quarters are situated. RRL has been getting bulk supply of electricity from Orissa State Electricity Board (OSEB) for the Laboratory as well as the staff quarters since 1964. No separate arrangement had been made for supply of electricity to staff quarters directly. For bulk supply of electricity, RRL had been making payment to OSEB at higher rates.

Short recovery of electricity charges of Rs.8.78 lakh from the occupants of staff quarters

From April 1991 to January 1997, RRL supplied 18,87,794 units to 303 occupants of its staff quarters. It recovered Rs.15.28 lakh as per domestic rates against payment at higher rate of Rs.24.06 lakh to OSEB for the same. Thus, it made avoidable payment of Rs.8.78 lakh to OSEB as the connections of staff quarters had not been de-linked from the Laboratory.

RRL approached OSEB only in July 1995 to delink the supply of electricity of staff quarters . In January 1997, OSEB allowed RRL separation of the power supply for the staff quarters but execution of work at field level had not started. RRL stated, in May 1997, that estimate for the execution of the work was yet to be approved by OSEB and they were pursuing the matter with them from time to time.

Due to delayed decision to delink the power supply of staff quarters from the Laboratory, RRL had made avoidable payment of Rs.8.78 lakh on electricity during April 1991 to January 1997.

(b) Loss of interest

Investment and closing balances during 1993-94 to 1996-97 were as follows :

(Rupees in lakh)

Year	Opening balance	Receipts during the year	Expenditure during the year	Investment	Closing balance
1993-94	96.641	885.182	718.064	00.284	263.475
1994-95	263.475	891.278	877.651	00.250	276.852
1995-96	276.852	1004.513	1007.913	nil	273.452
1996-97	273.452	1280.797	1210.059	nil	344.190

Non investment of surplus funds resulted in loss of interest of Rs.51.94 lakh

RRL did not deposit huge surplus funds during 1993-97 as shown above. RRL invested Rs.200 lakh in short term deposit only in 1997-98. Thus, failure to invest the un-spent amount of at least Rs.200 lakh from 1993-94 to 1996-97 in short term deposits resulted in loss of interest of Rs.51.94 lakh at the rate of 8 *per cent* during 1994-95 to 1996-97.

The matter was referred to the Council of Scientific and Industrial Research in September 1997; their reply was awaited as of January 1998.

2.3 Industrial Toxicology Research Centre, Lucknow

2.3.1 Introduction

Industrial Toxicology Research Centre (ITRC), Lucknow was established in November 1965 as a constituent laboratory of the Council of Scientific and Industrial Research (CSIR) to pursue experimental studies on the toxicity of various industrial products, biological monitoring of pesticides residue levels, monitoring of levels of chemical pollutants and noise in work and living environment, health surveys and industrial hygiene studies in industries with potential for occupational hazards.

The objectives of ITRC are to:

(i) identify the occupational and health hazards faced by industrial and agricultural workers, through systematic epidemiological surveys ;

(ii) undertake safety evaluation of industrial and environmental chemicals;

(iii) conduct experimental studies on the mode of action of industrial chemicals/ environmental pollutants;

(iv) develop suitable diagnostic tests for environmental pollutants and diseases caused by them and suggest remedial/ preventive measures;

(v) conduct monitoring studies on environmental pollution; and

(vi) collect and disseminate information on hazardous chemicals.

2.3.2 Organisational set up

ITRC is headed by a Director who is assisted by a Research Council (RC) and a Management Council (MC). While RC is entrusted with the task of

selection, monitoring, periodical review and final evaluation of research and development (R&D) projects, the MC assists the Director in administering and managing the affairs of ITRC. It has, at present, one field station at Gheru in Lucknow. Another field station called 'Occupational Health Centre' at Kanpur, established in early 1980, was closed in December 1993. The R&D activities of ITRC are organised in 32 sections/ laboratories covering six major disciplines. Apart from this, there are 12 divisions, broadly classified as administrative and technical wings, which provide infrastructural support to the R&D activities at ITRC.

2.3.3 Scope of Audit

This review covers financial and R&D management at ITRC including management of purchases of stores and construction works during 1992-97.

2.3.4 Highlights

- **ITRC had been irregularly employing daily wagers for clerical and supporting work.**

  (Para 2.3.5)

- **No new in-house projects were undertaken during 1992-97. ITRC was not maintaining any details of projects undertaken. Functioning of Research Council was found wanting; it did not carry out the entrusted work. It also did not ensure whether its directives were carried out by ITRC.**

  (Para 2.3.7)

- **Out of 150 projects under various heads, where files were requisitioned only 35 files were produced to Audit.**

  Due to delay in completion of two grants-in-aid projects, the intended objectives could not be achieved despite incurring an expenditure of Rs.5.28 lakh.

Scrutiny of two sponsored projects showed that ITRC failed to carry out/complete the projects in time and deliver the research output to the concerned sponsors.

(Para 2.3.8)

- **ITRC did not develop any of the four technologies envisaged during Eighth Plan. It, however, developed just one technology. Even that was other than the four visualized. The number of research papers contributed by ITRC scientists declined from 97 in 1992-93 to 43 in 1996-97. 31 *per cent* of research papers were published in journals having no impact factor.**

(Para 2.3.9)

- **3198 copies of various publications valued at Rs.11.66 lakh, published by ITRC during 1986-90, were lying unsold as of March 1997.**

(Para 2.3.13)

- **Out of unadjusted advances of Rs.128.92 lakh, Rs.76.34 lakh and Rs.21.09 lakh were outstanding against private parties and ITRC's officials respectively.**

(Para 2.3.16)

- **Failure of ITRC to take timely action, in terms of the agreement against the contractor, led to a loss of Rs.16.25 lakh in the form of additional cost on awarding the left over work of Silver Jubilee Lab Building to another contractor. It also faced accommodation problem as the work with completion schedule of February 1992 was yet to be completed as of July 1997.**

(Para 2.3.17)

2.3.5 Manpower

The position of personnel of different categories on the rolls of ITRC as on 31 March 1997, was as under:

Category of personnel	Sanctioned strength	Working strength	Vacancies		Excess	
			No.	Per cent	No.	Per cent
Scientific	117	102	15	12.8	-	-
Technical	180	168 .	12	6.7	-	-
Administrative	77	99*	-	-	22	28.6

* It included 36 daily wagers paid from the head 'Contingencies'.

36 temporary/ daily wagers employed for regular work without any sanctioned posts were being paid through contingencies. Men in position exceeded the sanctioned strength for administrative posts

ITRC resorted to employing daily wagers for clerical and supporting work under various projects during 1979-90. Out of 36 such daily wagers, 20 were given temporary status without creation of posts and the remaining 16 were continuing to work as daily wagers at the minimum of the respective scales. The wage bill of all the 36 temporary/daily wagers was being paid from contingencies without obtaining sanction for the posts. As a result, the actual administrative manpower exceeded the sanctioned strength by 28.6 *per cent* as of 31 March 1997.

2.3.6 Financial Management

Funds provided by CSIR constitute the major source for funding the activities of ITRC. The receipts from contract projects and miscellaneous receipts supplement the resources of ITRC. The year-wise position of receipts and expenditure of ITRC during Eighth Five Year Plan was as under:

(Rs.in lakh)

Year	Sources					Application			
	From CSIR		From Contract Projects	Misc. Receipts	Total	Revenue	Capital	Contract Projects	Total
	Revenue	Capital							
1992-93	323.84	44.21	33.88	7.73	409.66	323.83	44.20	48.79	416.82
1993-94	349.02	63.83	89.12	3.70	505.67	348.23	64.62	57.64	470.49
1994-95	387.05	117.14	88.34	2.94	595.47	386.38	117.81	57.62	561.81
1995-96	449.25	169.62	71.96	5.75	696.58	443.29	179.79	65.42	688.50
1996-97	507.72	183.28	137.29	5.64	833.93	507.96	190.44	92.07	790.47

CSIR laboratories are also required to generate external cash flow (ECF) which should not be less than one-third of their R&D expenditure. The year-wise R&D expenditure and actual ECF generated during 1992-97 were as under:

(Rs.in lakh)

Year	R&D expenditure	ECF actually generated	ECF as a percentage of R&D expenditure
1992-93	256.99	33.88	13.18
1993-94	296.28	89.12	30.08
1994-95	314.21	88.34	28.11
1995-96	384.64	71.96	18.71
1996-97	408.95	137.29	33.57
Total	1661.07	420.59	25.32

ITRC could generate ECF of Rs.420.59 lakh against Rs.815 lakh targeted in Eighth Plan

ITRC generated ECF amounting to Rs.420.59 lakh against projected ECF of Rs.815 lakh in the Eighth Plan document resulting in non-achievement of targets by 48.4 *per cent*

R&D Management

2.3.7 In-house projects

In-house projects are approved by RC keeping the overall objectives of ITRC in view.

During test check of the records relating to in-house projects, the following facts emerged:

(i) During 1992-97, no new in-house projects were undertaken by ITRC.

PME cell failed in project documentation, rendering the expenditure of Rs.18.85 lakh on salary of staff of PME cell during 1992-97 unfruitful

(ii) ITRC did not maintain any project related documents containing information on project objectives, approved costs, duration and actual expenditure incurred on each of them. The Planning, Monitoring and Evaluation (PME) cell failed to discharge its responsibilities like project budgeting, costing and maintaining individual project folders etc., rendering Rs.18.85 lakh on the salary of its staff during 1992-97 unfruitful.

CSIR stated, in January 1998 that initiative would be taken by PME Cell to maintain the project folders from 1 April 1998.

(iii) Though 28 in-house projects were completed during 1992-94, 31 scientists associated with these projects continued to be deployed as of March 1997 on the same projects. ITRC also failed to prepare the final

31 scientists associated with the 28 completed in-house projects were continued on the same projects

reports in respect of the completed in-house projects. Explaining the lapse, ITRC stated that some facets (experiments) of the 28 projects completed during 1992-94 were still continuing. On one hand it was showing 28 projects as having been completed and, on the other, 31 scientists were deployed even after the purported closure of the projects.

CSIR stated in January 1998 that most of the scientists in R&D projects were involved in more than one in-house project and, therefore, the question of their continued deployment after completion of 28 projects should not arise. The reply of CSIR was not consistent with the statement of ITRC. The fact remained that these scientists continued on projects which had been completed much earlier.

RC did not comment on non-initiation of new projects or on the failure of ITRC to act upon its own recommendations and non-preparation of completion reports

(iv) RC was entrusted with the task of advising and recommending formulation of research programmes and conducting periodical review to assess the progress of the research activities. RC did not comment on non initiation of new projects or on the failure of ITRC to act upon RC's own recommendations regarding closing the existing in-house projects and undertaking new ones. Interestingly, the issues regarding failure of ITRC to prepare final reports in respect of completed projects and to re-deploy the concerned scientists after completion of the projects was never deliberated upon by RC.

CSIR stated that the recommendation of RC was to consolidate the existing research projects of ITRC in six new areas. The reply of CSIR was not tenable inasmuch as the RC had categorically recommended the termination of all the existing projects and for initiating R&D in new areas.

2.3.8 Contract Projects

(i) Grants-in-aid and collaborative projects

ITRC produced only 11 grants-in-aid project files out of 32 requisitioned by Audit

Out of 32 project files, involving expenditure of Rs.87.47 lakh requisitioned by Audit for scrutiny, ITRC produced only 11 files including those relating to two collaborative projects. In three cases, ITRC could not complete the projects in time to provide the concerned grantors the required results as detailed below:

ITRC collected samples of treated water once in a month at fixed times instead of once in a week, which defeated the purpose of study

(a) Ganga Project Directorate (GPD) of the Ministry of Environment and Forests entrusted a project to ITRC in June 1995 for one year under which ITRC was to give its recommendation on optimisation of chlorination doses for disinfection of the treated waste water, to determine efficacy of treatment and safe disposal of treated waste water to aquatic system, by conducting weekly tests. Instead of conducting weekly tests, ITRC conducted monthly tests resulting in shortfall of 75 *per cent*. In the process, ITRC defeated the very purpose of the study commissioned by the GPD. Though the project was stated to have been completed in December 1996 at an expenditure of Rs.3.38 lakh, including Rs.2.10 lakh provided by GPD, the completion report was not ready and balance Rs.1.28 lakh had not been received by ITRC from GPD as of January 1998.

CSIR stated, in January 1998, that samples of treated waste water were to be collected every month and final report was submitted to GPD in November 1997. The reply was not tenable as the scope of work under the project as intimated by GPD in June 1995 contemplated collection of samples every week.

ITRC failed to achieve the desired results in ICMR assisted project

(b) Indian Council of Medical Research (ICMR) sanctioned a project in June 1994 titled 'Heavy metals mediated modulation in insulin biosynthesis' and released Rs.1.90 lakh in August 1994 and September 1995. ITRC approached ICMR in November 1996, for extension of the project by a year. It was not acceded to by ICMR due to failure of ITRC to submit the second annual progress report. While submitting the second annual progress report in May 1997, ITRC sought extension by 18 months stating that actual work on the project was done for only six months as the research associate had resigned midway and no other substitute could be appointed. The request for extension of the project was not acceded to by ICMR. Consequently, the project failed. CSIR accepted the facts in January 1998.

(ii) Sponsored projects

Out of 55 files, relating to completed sponsored projects that were requisitioned, only 14 were made available to Audit. There was no

Only 14 files of sponsored projects were produced by ITRC out of 55 requisitioned by Audit

response from ITRC regarding the remaining files despite persistent follow up. In the following three cases, ITRC failed to carry out/complete the projects in time and deliver the research results to the concerned sponsors:

ITRC could not complete the project in time to enable Bihar Government to comply with the directives of the Hon'ble Supreme Court

(a) To comply with the direction of the Hon'ble Supreme Court of India, Government of Bihar approached ITRC in September 1992, seeking expert opinion on whether Low Density Polyethylene films used for packing of country liquor could chemically react with the liquor and become injurious to the health of consumers. ITRC agreed in October 1992 to take it up as a sponsored study, assuring submission of report in due course of time. The Government of Bihar provided Rupees three lakh to ITRC in March 1994. Project records made available to Audit revealed that no study, whatsoever, was conducted by ITRC and, as a result, no report was sent to the sponsor as of June 1997.

CSIR admitted in January 1998 that there was delay in completion of the project and added that the completion report had since been sent to the Government of Bihar. Due to delay, the Government of Bihar could not comply with the direction of Hon'ble Supreme Court with due promptitude.

ITRC did not complete the studies probing reasons for high mortality rate of dogs at the Dog School of BSF, Tekanpur

(b) Suspecting high mortality rate in their dogs, particularly in pups at the Dog School at Tekan Pur, due to exposure to compressed natural gas emanating from the nearby Tear and Smoke Unit, the Border Security Force (BSF) commissioned the services of ITRC in October 1992 to conduct studies to confirm their suspicion. ITRC intimated BSF, in October 1993, that the studies would be carried out by them during three seasons separately in August, December 1993 and January 1994, at total charge of Rs.0.80 lakh. ITRC received Rs.0.72 lakh from BSF in May 1994. After studies conducted by ITRC during two seasons in January and August 1995, no action was taken by ITRC to conduct the study for third season in December 1995. As a result of this, the project could not be completed as of January 1998 and BSF remained unaware of the actual reasons for high mortality rate of their dogs and consequent remedial measures to be taken.

CSIR stated in January 1998 that last season's samples were collected in December 1997 and the same were being analysed in ITRC. The fact remained that the project was revived after Audit pointed out the inaction of ITRC and the project was incomplete as of January 1998.

(iii) Consultancy projects

The position of the consultancy projects taken up by ITRC during 1992-97 was as under:

Year	Number of consultancy projects			
	Brought forward	Taken up	Comp-leted	Carried forward
1992-93	1	1	-	2
1993-94	2	1	1	2
1994-95	2	4	2	4
1995-96	4	14	6	12
1996-97	12	19	17	14
Total	1	39	26	14

Out of 26 consultancy projects files requisitioned for scrutiny, only ten files were produced to audit by ITRC

The consultancy activities of ITRC during 1992-95 remained negligible and picked up only in 1995-96 when it received 14 consultancy assignments. Out of 26 files relating to the completed consultancy projects that were requisitioned, only 10 files were made available for Audit scrutiny and there was no response about the remaining ones.

2.3.9 Development of technology and publication of research papers

(i) Development and transfer of technology

ITRC was expected to develop the following four technologies during Eighth Plan :

- Development of immuno-diagnostic kit against aflatoxin.
- Development of diagnostic kit for Fusarioum toxin.
- Large scale production and purification of antibodies against aflatoxin.
- Development of menthol detection methods for pan masala.

ITRC could develop only one technology during 1992-97, that too other than the four technologies expected to be developed by it

All the aforesaid four technologies sought to be developed during 1992-97, remained undeveloped. However, it succeeded in developing just one technology in 1996-97 and that too other than those mentioned above.

Though a patent application had been filed by ITRC for the developed technology, no marketing effort had been initiated.

CSIR stated, in January 1998, that further studies were required to bring it to the stage of commercial exploitation. Further, CSIR sought to justify ITRC's non-performance by stating that all the four technologies were to be developed by a scientist and a senior research fellow who left ITRC subsequently. The reply confirms that ITRC, as an institution, failed to deliver results.

During 1992-93, ITRC transferred a technology relating to 'Amrit Kumbh', that was developed in 1989, to two firms for which it received licence fee of Rs.1.20 lakh from the licensees. However, no royalty on the production of 'Amrit Kumbh' was received by ITRC as of June 1997. ITRC had no system for ensuring that licensees remitted royalty to it as and when the same became due.

(ii) Research papers

The year-wise position of research papers published by ITRC scientists during 1992-97 was as under:

Year	No. of Scien-tists	No. of Research papers (RP) published in			No. of Journals		Ratio of RP having no IF to total RP	IF of the Journals		Ratio of publication having IF per scientist per annum
		Indian Journals	Foreign Journals	Total	having Impact Factor (IF)	having no IF		Min	Max.	
1992-93	111	36	61	97	73	24	24.74	0.05	7.67	0.66
1993-94	110	28	37	65	32	33	50.77	0.05	7.67	0.29
1994-95	107	28	58	86	62	24	27.91	0.05	3.40	0.58
1995-96	107	14	50	64	45	19	29.69	0.01	3.40	0.51
1996-97	102	09	34	43	34	9	20.93	0.07	3.10	0.33

Research papers contributed by ITRC scientists declined from 97 in 1992-93 to 43 in 1996-97. 109 research papers were published in journals having no impact factor

Number of research papers contributed by ITRC scientists registered a decline from 97 in 1992-93 to 43 in 1996-97, though the number of scientists remained almost static between 111 and 102 during the same period. It was also noticed that of 355 papers published during 1992-97, 109 papers were published in journals, which had no impact factor*.

CSIR admitted the facts in January 1998.

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* Impact factor : A measure of frequency with which an 'average article' in a journal has been cited in a particular year.

Management of purchases and stores

2.3.10 Purchases

Open tenders should be invited for purchases exceeding Rs.0.50 lakh as per rational purchase procedure approved by CSIR for its institutions. Test check of purchase cases revealed that in 30 purchase cases involving amounts exceeding Rs.0.50 lakh in each case and Rs.180.27 lakh in aggregate, instead of inviting open tenders, ITRC invited single tender in 11 cases and limited tenders in 19 cases.

CSIR stated in January 1998 that the purchases had been made on the recommendation of the Standing Purchase Committee (SPC). CSIR, however, did not offer any comment on SPC's failure to circumvent the prescribed purchase procedure.

2.3.11 Improper maintenance of purchase files

Purchase files were not maintained properly

Test check of 54 cases relating to procurement of imported equipment/consumables etc. pertaining to the period 1992-97 revealed that notes indicating the dates of various events, processing of cases at different levels and sanctions were not kept on record in any of the cases, and in some of the cases important documents like purchase orders, cargo arrival notices, transport receipts, inspection reports and installation certificates were not available in the concerned files.

ITRC accepted the facts in June 1997 and stated that in future purchase files would be maintained in proper order.

2.3.12 Purchase cases

(i) Equipment procured after closure of project

An equipment valued at Rs.7.35 lakh was procured after completion of the funded project

ITRC required a 'Gas Liquid Chromatograph (GLC)' for use in a grants-in-aid project titled 'Genetic engineering of micro-organisms for biodegradation of chlorinated pesticides' sanctioned by Department of Biotechnology (DBT) in March 1993 for a duration of three years. Though the grant was received by ITRC in March 1993, the purchase order for GLC was placed on a Singapore based firm in February 1995 at a cost of ¥

19,76,823, equivalent to Rs.6.81 lakh. The consignment arrived at Air Cargo Delhi in October 1995, and it reached ITRC in May 1996 after Customs clearance. The project was already completed by ITRC in March 1996. It had not been installed till March 1997. Thus, procurement of the equipment costing Rs.7.35 lakh not only lacked justification, its future use was also doubtful as the concerned project had already been completed.

(ii) Avoidable payment of demurrage

No consignment was released from Air Cargo without paying demurrage by ITRC despite engaging clearing agent

Purchase cases of imported equipment, spares and chemicals etc. and bills of clearing agent revealed that ITRC took 68 to 202 days for clearance of 33 imported consignments, from the date of their receipt at Air Cargo Complex. This resulted in payment of Rs.2.54 lakh as demurrage during 1992-97 despite engaging clearing agent for the purpose. It was noticed that not a single imported consignment was got cleared by ITRC from the cargo without paying demurrage during 1992-97.

2.3.13 Idle publications

As on 31 March 1997, 3198 copies of various publications by ITRC valued at Rs.11.66 lakh, published during 1986-90, were lying unsold. This indicated that either the print order was given much in excess of actual requirement or there was lack of marketing efforts by ITRC.

2.3.14 Non-moving and unserviceable stores

On scrutiny of stock registers it was observed that 148 items had never moved for periods ranging from two to 26 years since the date of their purchase. The book value of 76 such items worked out to be Rs.1.78 lakh and ITRC did not have the value of the remaining 72 items.

222 store items including equipment were lying either as unserviceable or not in working condition. Of these, 113 had accumulated during 1995-97. Although the earliest of such items were lying since 1984, no action for their condemnation and disposal was taken by ITRC. The book value of only 131 items amounting to Rs.8.79 lakh was available with ITRC and value for the remaining 109 items was not available.

2.3.15 Physical verification of stores

Annual physical verification and periodical inspection of the stores is mandatory under the General Financial Rules. Last physical verification of the stores done at ITRC in 1992-93 was incomplete. Thus, physical verification of all stores items was not being conducted annually since long.

Library of ITRC had 15266 books including journals, costing Rs.195.18 lakh as of 31 March 1997. Physical verification of library books was also not done after 1993-94 though required to be conducted annually.

2.3.16 Accounts

(i) Bank reconciliation

ITRC's bank account was shown to have been reconciled upto 31 January 1996. Thereafter, no reconciliation was done. It was found by Audit that certain bank transactions as old as 25 years were pending adjustments with their bankers. A scrutiny of the bank reconciliation statement revealed the following:

(a) In 764 cases, from November 1971 to January 1996, amounts totalling Rs.58.31 lakh were debited by their bankers in the account without specific authorisation by ITRC. Of these, 691 cases involving Rs.53.43 lakh pertained to the period from November 1971 to March 1993. ITRC did not take up the matter with their bankers for obtaining details of these debits in their bank account either for effecting entries in its cash book or getting the same adjusted from the bankers. The delay in reconciliation of these items could increase the risk of fraud/embezzlement.

(b) In 67 cases pertaining to the period from November 1976 to January 1996, receipts totalling Rs.6.03 lakh accounted for in cash book did not figure in the bank statements. No efforts were made by ITRC to obtain credit of the amounts deposited by it with their bankers. The embezzlement of the receipts cannot be ruled out till reconciliation of the accounts.

(c) In 417 cases, while the bank statement showed Rs.68.74 lakh as having been realised by the bank directly on behalf of ITRC such receipts had not been shown in ITRC's cash book. Out of these, 386 items involving Rs.35.08 lakh pertained to the period from January 1973 to March 1993. No action had been taken to account for old items in the cash book.

CSIR stated, in January 1998, that 23 items totalling Rs.1.62 lakh and 31 items totalling Rs.18.98 lakh had been cleared by conducting reconciliation upto October 1997 against the items shown under (b) and (c) above.

(ii) Outstanding advances

An amount of Rs.128.92 lakh was outstanding as of 30 June 1997 against officials on account of travelling allowance (TA), leave travel concession (LTC) and cash advances for purchases to staff as well as advances for purchase and supply of materials/equipment to private parties, government organisations etc. paid upto 31 March 1997 as indicated below:

(Rupees in lakh)

Year	Government Departments		Private Parties		Cash advances to staff for purchases		TA/LTC advances to staff		Total unadjusted advances
	Item	Amount	Item	Amount	Item	Amount	Item	Amount	Amount
1969-70 to 1991-92	135	9.95	302	30.72	699	8.68	346	4.26	53.61
1992-93	51	2.64	25	2.71	43	0.50	24	0.56	6.41
1993-94	53	4.14	14	2.73	37	1.23	22	0.27	8.37
1994-95	40	1.38	20	1.05	21	0.35	15	0.35	3.13
1995-96	24	8.89	31	8.42	27	0.99	21	0.60	18.90
1996-97	16	4.49	33	30.71	22	2.94	23	0.36	38.50
Total	319	31.49	425	76.34	849	14.69	451	6.40	128.92

Of these, Rs.76.34 lakh were outstanding against private parties from 1970-71 onwards, Rs.30.72 lakh being more than five years old . There was no follow up by ITRC with the concerned parties either for obtaining the supplies contracted for or to recover the amount. Like-wise, amounts totalling Rs.14.69 lakh advanced by ITRC to its employees for cash

Unadjusted advances were outstanding against private parties (Rs. 76.34 lakh), Government organisations (Rs.31.49 lakh) and ITRC's officials (Rs.21.09 lakh) from 1970-71, 1974-75 and 1969-70 onwards respectively

purchases etc. were pending adjustment from 1969-70 onwards. Out of this, amounts totalling Rs.8.68 lakh was pending adjustment for more than five years. The recovery process for TA/LTC advances from its employees was also found wanting inasmuch as Rs.4.26 lakh were outstanding for more than five years. Rs.31.49 lakh were outstanding with Government organisations since 1974-75. ITRC's lack of concern in this regard reflects poorly on its financial management.

CSIR, without furnishing any details, stated in January 1998 that an amount of Rs.26.84 lakh had since been adjusted.

2.3.17 Extra expenditure on construction of building

Construction work for SJB Building was awarded in June 1990 for completion in 18 months

The work of construction of Silver Jubilee Block Lab building was entrusted by ITRC to M/s Kohli Constructions, Lucknow in June 1990 at a cost of Rs.48.33 lakh to be completed in 18 months by February 1992. There being no provision in the agreement, ITRC rejected the contractor's requests for cost escalation. Despite the delay of 17 weeks, ITRC extended the period for completion of the building upto June 1992. Unable to complete the work, the contractor sought another extension of 10 months from 1 July 1992 or the date on which ITRC took decision on the question of cost escalation. Instead of taking action for determination of the contract in view of the slow progress of work and conditional request of the contractor, ITRC granted second extension in August 1992 for completion of the work by December 1992. This offered the contractor an opportunity to stop the work in November 1992 and seek the appointment of an Arbitrator. The Arbitrator appointed by CSIR in May 1993, awarded a sum of Rs.1.86 lakh plus interest @ 15 *per cent* per annum from 5 May 1993 in favour of the contractor. While the arbitration was underway, ITRC intimated the contractor, in August 1994 that the contract stood determined and that the left-over 56 *per cent* work would be got done at his risk and cost. The contract for the remaining work was awarded by ITRC to M/s M. A. Constructions, Lucknow in June 1995 at a cost of Rs.43.24 lakh with cost escalation for completion by May 1996. As a result, ITRC had to incur extra expenditure of Rs.16.25 lakh for the remaining work. The work was not completed as of June 1997.

ITRC allowed second extension upto December 1992. Contractor stopped work in November 1992 and sought arbitration

The Arbitrator awarded Rs.1.86 lakh with interest in favour of contractor. ITRC engaged another builder in June 1995 to complete the remaining work at the cost of Rs.43.24 lakh with cost escalation

Thus, besides incurring additional expenditure of Rs.16.25 lakh on balance of 56 *per cent* of work, ITRC also faced accommodation problem due to the inordinate delay in the construction of the building.

2.4 Loss due to defective agreement

Omission on the part of National Institute of Oceanography to include a suitable clause in their agreement with Shipping Corporation of India, for operation and management of their research vessel, enabled the latter to appropriate Rs.163.67 lakh from the insurance claim after an accidental fire in the vessel.

Research vessel Gaveshani owned by NIO was entrusted to SCI for management and operation

The National Institute of Oceanography (NIO), Goa, a unit of the Council of Scientific and Industrial Research (CSIR), entered into an agreement with the Shipping Corporation of India Limited (SCI) in July 1991 for the management, safety and economic operation of its research vessel "Gaveshani" on payment at mutually agreed terms. This arrangement was in existence since 1978.

The vessel was damaged in a fire accident. A committee of experts recommended declaration of the vessel as total constructive loss

The vessel met with a fire accident on 26 August 1994 at the Princess Dock, Mumbai, while it was under dry dock and became unusable. CSIR constituted a committee consisting of experts from shipping industry in December 1994 to consider the feasibility of repairing the vessel. The committee recommended in February 1995 that the vessel be declared "Constructive Total Loss" and insurance claim be preferred with the help of SCI.

CSIR vacillated for 10 months without acting on the recommendation

Insurance claim for Rs.380 lakh settled in November 1996

Eventhough the report of the committee was received in February 1995, the decision to declare the vessel as "Constructive Total Loss" was taken by CSIR after ten months in December 1995 and thereafter, SCI lodged insurance claim. The insurance company took the vessel into custody in December 1995 and settled the claim for Rs.380 lakh in November 1996.

Defective agreement enabled SCI to adjust the entire insurance claim of Rs.380 lakh against their claim

It was observed in Audit in May 1997 that the agreement with SCI did not provide for any penal clause for the failure of SCI to ensure safety of the vessel and automatic cessation of liability towards maintenance and laid up charges in the event of any calamity or the ship going out of use. Moreover, the defective agreement also enabled SCI to lodge insurance claim on behalf of NIO and receive the payment. As a result, SCI adjusted the entire insurance claim of Rs.380 lakh received against their claim of Rs.388.51 lakh on NIO towards operating and laid up expenses upto September 1995 and interest on dues upto October 1996 and placed a demand for the balance amount of Rs.8.51 lakh. Out of the total claim of Rs.388.51 lakh, an amount of Rs.172.18 lakh related to the period after the date of fire. Based on NIO's proposal in April 1997, Ministry of Industry appointed an arbitrator in August/September 1997 for settlement of the dispute arising from unilateral adjustment by SCI. Arbitration award was awaited as of October 1997.

Based on NIO's proposal Ministry of Industry appointed an arbitrator against action of SCI

Thus, the defective agreement resulted in SCI appropriating Rs.163.67 lakh out of the proceeds of insurance towards the dues of Rs.172.18 lakh, for the period after the fire, besides demanding the balance of Rs.8.51 lakh.

NIO stated, in October 1997, that though it was the owner, the insurance policy was in the name of SCI as the 'Assured', on the basis of the agreement between SCI and insurance company.

The matter was referred to CSIR in August 1997; their reply was awaited as of January 1998.

2.5 Non-surrender of un-spent grant

Failure of CSMCRI to surrender the unutilised grant of Rs.44.74 lakh resulted in blocking of funds.

CSMCRI was to set up a plant for manufacture of technical grade Potassium Chloride

The Department of Ocean Development (DOD) approved in March 1991 the establishment of a pilot-cum-demonstration plant with a capacity of producing three tonnes of Potassium Chloride per day. The plant was

based on the know-how developed by Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar and was to cost Rs.187.09 lakh. DOD released Rs.45 lakh as first instalment for this purpose to CSMCRI in March 1991. The plant was to be set up in collaboration with Hindustan Salt Limited (HSL), Kharaghoda, Gujarat. A tripartite Memorandum of Understanding was executed in November 1991 by DOD, CSMCRI and HSL but no action was initiated by CSMCRI to set up the plant. In a meeting of Research Council in September 1992, the production of technical grade Potassium Chloride was reviewed and the proposed technique was not considered economical. Thus, CSMCRI decided to shift the emphasis of the project to that of production of refractory grade Magnesia with Potassium Chloride, as a by-product. Even on this project, clear picture had not emerged as of May 1997 as it involved interaction with some private industries.

This project was not found viable. Hence emphasis shifted to refractory grade Magnesia with Potassium Chloride as by-product but without approval of Department of Ocean Development

CSMCRI spent only Rs.0.26 lakh on travelling, contingencies etc. and the un-spent amount of Rs.44.74 lakh had been kept in current account in a bank, instead of surrendering the same to DOD. Formal approval of DOD for changing the scope of the project had not been obtained as of November 1997. Moreover, the main objective of developing a technology for production of Potassium Chloride and thereby saving foreign exchange on its import was defeated. There was also lack of monitoring on the part of DOD as they did not insist on proper utilisation of the amount given as grants to CSMCRI.

Un-spent balance of Rs.44.74 lakh was kept in current account since March 1991 instead of being surrendered to DOD

Objective of savings in foreign exchange was not achieved

In its reply of December 1997, the Council of Scientific and Industrial Research did not offer any comment on the failure of CSMCRI to surrender the unspent amount to DOD.

2.6 Avoidable expenditure

An equipment required for a sponsored project was procured after closure of the project. It remained idle since its procurement, resulting in avoidable expenditure of Rs.17.04 lakh.

NML procured a gas analyser for a sponsored project which had been completed before the purchase order was placed

The National Metallurgical Laboratory (NML), Jamshedpur decided in April 1991 to purchase a gas analyser alongwith accessories for a sponsored project "Production of low P&S liquid iron through Vertical Retort Direct Reduction (VRDR) route". Though the project had already been completed in June 1991 by analysing the gas samples by a conventional technique, NML placed the purchase order in July 1991 for procurement of the equipment. The equipment and its accessories costing Rs.17.04 lakh, were received by NML between February 1992 and July 1993.

Even after commissioning of the equipment in January 1997 it remained idle as NML did not undertake any project in which it could be used

NML did not undertake any project in which this gas analyser could be used till December 1996. In the absence of its necessity, the equipment remained uncommissioned till December 1996. The equipment was commissioned only in January 1997 and even after that it had not been used as of September 1997. Meanwhile, the warranty etc. of the equipment had expired in December 1994. The expenditure of Rs.17.04 lakh on its procurement was thus unproductive.

CSIR stated, in September 1997, that since running of the VRDR system was extremely expensive, it would be used on sponsorship basis for which laboratory was making efforts. CSIR's reply lacked conviction, especially because of their failure to find any use of the equipment for roughly half a decade.

Chapter 3 : Department of Atomic Energy

3.1 Nuclear Fuel Complex, Hyderabad

3.1.1 Introduction

Nuclear Fuel Complex (NFC), an industrial unit under the Department of Atomic Energy (DAE) was established at Hyderabad in 1970 to indigenously manufacture and supply fuel bundles for Pressurised Heavy Water Reactors (PHWR) and Boiling Water Reactors (BWR), zircaloy components, calandria and coolant tubes, for meeting the requirements of the nuclear power programme of DAE.

3.1.2 Scope of Audit

The performance of main plants of NFC for the last five years from 1992-93 to 1996-97 was reviewed in Audit during the period May 1996 - June 1997, with particular emphasis on the production pattern. Areas relating to accounting were also test-checked.

3.1.3 Organisational set up

NFC is headed by a Chief Executive who is assisted by an Additional Chief Executive and seven Heads of Units. The policies of NFC are evolved by a Board of Management which consists of 11 members from DAE, one from Nuclear Power Corporation of India Limited (NPCIL) and one from other industry. The Chief Executive is the Chairman of the Board.

3.1.4 Highlights

- **Quality of production of pellets in Ceramic Fuel Fabrication Plant (CFFP) was poor; there were heavy rejections of pellets. Accumulated stock of rejected pellets at the end of March 1997 was 629.68 tonnes.**

  Heavy rejections of pellets affected the production of fuel bundles in CFFP, which was much below the installed

capacity varying between 40 and 61 *per cent* during 1992-97. Targets set below the installed capacity were further reduced by the NFC Board. Successive years saw fixing of lower targets. Actual production was even below the targets. Expenditure of Rs.76.74 crore incurred in 1989 for enhancing the capacity, was unfruitful.

(Para 3.1.5)

- Because of unsatisfactory performance of CFFP, the interlinked Zircaloy Fabrication Plant (ZFP) remained under-utilised; there was accumulation of 9.12 lakh zircaloy tubes, sufficient for three and a half years at the existing demand level. Thus the investment of Rs.16.38 crore on expansion of this plant, completed in March 1994, was rendered unfruitful.

(Para 3.1.6)

- Rs.190 crore were spent on setting up three new plants to produce fuel bundles. Faulty project planning resulted in completion of the New Uranium Fuel Assembly Plant, where the fuel bundles were to be assembled, without the completion of the New Uranium Oxide Fuel Plant, where the pellets were to be produced. This rendered an expenditure of Rs.40.79 crore on the New Uranium Fuel Assembly Plant idle.

  New Zircaloy Fabrication Plant was set-up for producing fuel tubes but both the forward and backward linkages for this new plant were missing. Whereas the Zirconium Sponge Project to produce zirconium ingots for this plant had not been taken up as of December 1997, there was no demand for the fuel tubes as even the existing ZFP was being under-utilised. Thus, the plant set-up at a cost of Rs.69.51 crore, was lying idle.

(Para 3.1.7)

- **Zirconium Sponge and Titanium Sponge Project was proposed to be established in the joint sector. Capital expenditure of Rs.8.29 crore had been incurred on this project upto March 1997 (including expenditure on idle manpower), despite the fact that the joint sector partner had not been identified and the technology for this project was yet to be established.**

(Para 3.1.9)

- **Preparation of proforma accounts was in arrears since 1993-94.**

(Para 3.1.10)

- **Flaw in the scheme for payment of production linked bonus to employees and retrospective revision of production targets resulted in irregular payment of Rs.47.25 lakh to employees for the year 1995-96.**

(Para 3.1.11)

3.1.5 Unsatisfactory performance of Ceramic Fuel Fabrication Plant (CFFP)

CFFP performs the following functions :

(i) It converts uranium dioxide powder into uranium oxide pellets (Pellets). The uranium dioxide powder is extracted from uranium ore in the Uranium Oxide Plant.

(ii) These pellets are loaded into the zirconium fuel tubes (Fuel tubes), which are used to produce fuel bundles. 19 such tubes, loaded with pellets, are capped and then strapped together with spring garters to produce one PHWR fuel bundle (Fuel bundle).

This plant was initially set up in 1970 with a capacity of 100 tonnes of fuel bundles, which was subsequently increased in 1986 to 225 tonnes. In 1989, the capacity was further enhanced to 300 tonnes with an investment of Rs.76.74 crore.

(a) ***Quality of production***

The production of pellets in CFFP did not meet the quality requirement, resulting in heavy rejection of pellets as indicated below :

Year	Percentage of	
	Recovery	Rejections
1992-93	51.60	48.40
1993-94	51.70	48.30
1994-95	43.50	56.50
1995-96	44.50	55.50
1996-97	56.80	43.20

There was heavy rejection of pellets, as quality of production was poor

Initially, when the plant started, it was estimated that 125 tonnes of uranium dioxide would be consumed to produce 100 tonnes of pellets. In other words, the rate of recovery was estimated at 80 *per cent.* However, NFC could not maintain the recovery rate of even 58.4 *per cent* achieved in 1989-90 i.e. prior to the augmentation scheme. It was observed in Audit that rejected pellets remained in stock as NFC had not perfected the process to dissolve them and retrieve uranium oxide powder for re-use. The accumulated stock of rejected pellets at the end of March 1997 was 629.68 tonnes.

Heavy rejection of pellets, resulting in low recovery, affected the overall production of fuel bundles. NFC Board in its meetings held in April 1996 expressed concern on the continued low recovery and heavy rejection of pellets. NFC stated in September 1996 that the reasons for constant downward trend in recoveries were due to various technical problems such as cracking, bulging of pellets, sinterability of uranium oxide powder, etc.

(b) ***Production was much below installed capacity***

Target and actual production of fuel bundles during 1992-93 to 1996-97 were as under :

(In tonnes)

Year	Installed capacity	Target as per Budget Estimate	Target fixed by NFC Board	Actual production	Percentage of production to installed capacity	Expected demand	Despatches	Closing Balance
1992-93	300	270	257	183.23	61.07	NA	174.92	18.36
1993-94	300	245	250	171.15	57.05	NA	105.60	83.91
1994-95	300	250	200	128.14	42.71	200.00	107.90	104.15
1995-96	300	240	200	121.31	40.43	297.46	136.40	89.06
1996-97	300	200	180	161.21	53.73	383.04	204.28	45.99

Actual production of fuel bundles during 1992-97 varied between 40.43 *per cent* and 61.07 *per cent* of the installed capacity

It could be seen from the above table that actual production during 1992-97 was not only much below the installed capacity, varying between 40.43 and 61.07 *per cent*, it registered a downward trend till 1995-96 with marginal improvement in 1996-97, when it was 53.73 *per cent* of the installed capacity. The budgeted targets were reduced by the NFC Board every year; successive years saw fixing of lower targets. The targeted production also could never be achieved; NFC, however, continued paying production linked bonus.

NFC had identified certain problems such as unaccepted microstructure bulging, cracks and low density in sintered pellets etc. as reasons for low production. To increase the production, a committee, appointed in January 1989, suggested improvements such as preventive action for powder spillage, improvement in dye design, better handling of pellets, addition of lubricants etc. Despite implementing the suggestions, the production did not improve.

The fact remained that there was heavy rejection of pellets as quality of pellets was not upto the mark and this resulted in low utilisation of CFFP. As production of fuel bundles at 161.21 tonnes during 1996-97 was even below the capacity of 225 tonnes before the expansion of CFFP took place in 1989, investment of Rs.76.74 crore on expansion/augmentation of the CFFP remained largely unproductive.

3.1.6 *Under-utilisation of Zircaloy Fabrication Plant (ZFP)*

This plant produces zircaloy fuel tubes from zirconium ingots produced in the Zirconium Sponge Plant. These tubes are sent to the CFFP, where pellets are loaded into tubes. Thus, utilisation of capacity of ZFP depends on the production requirement of CFFP. In view of the low production and heavy rejection in the manufacture of pellets in the CFFP, ZFP also remained under-utilised as shown below:

Year	Installed capacity	Target of production	Target achieved	Per centage of utilisation of capacity	Production of fuel tubes		Stock of fuel tubes at the end of the year
					Target	Achievement	
	(Tonnes)				(Numbers)		
1992-93	50	69.75	*79.76	*159.5	4,50,000	5,68,760	2,30,985
1993-94	50	53.00	*58.21	*116.4	6,00,000	6,00,213	7,05,353
1994-95	80	52.00	55.17	69.0	6,00,000	6,19,469	11,13,088
1995-96	80	37.52	24.48	30.6	3,00,000	2,90,274	11,10,000
1996-97	80	43.50	29.00	36.3	1,00,000	87,696	9,12,017

* Production in excess of the installed capacity was due to induction of semi-finished product in production line instead of from raw-material stage.

Unsatisfactory performance of CFFP restricted the performance of ZFP as they were inter-connected. There was accumulation of over 9 lakh PHWR fuel tubes which would suffice for another three and half years

Initially, this plant had a capacity to produce 35 tonnes of zircaloy tubes per year which was enhanced to 50 tonnes per year in 1988-89. Based on a decision taken in February 1988, the capacity was further enhanced to 80 tonnes per year through an expansion programme completed in March 1994 at a cost of Rs.16.38 crore. The enhancement of capacities did not yield any return on the investment of Rs.16.38 crore inasmuch as the production during 1995-97 was even less than the earlier capacity of 50 tonnes. Even with the reduced production, there was stockpiling of 9.12 lakh tubes at the end of March 1997 as CFFP was not able to utilise them. The average consumption of these fuel tubes was 2.61 lakh per annum during the last five years. This accumulated stock would suffice to meet the demand for another three and a half years. While fixing the targets for 1995-96, NFC Board observed that in view of stockpiling, there was no point in higher targets of six lakh for production of fuel tubes and this could be reduced to three lakh. For the year 1996-97, the target was further brought down to one lakh. This scenario would continue till the production in CFFP is improved or NFC is able to find new avenues for the sale of these fuel tubes.

3.1.7 *Establishment of three new projects costing Rs.700 crore at Hyderabad*

Despite under-utilisation of existing plants, new plants are coming up for same product line on which Rs.190.02 crore had been spent upto March 1997

Keeping in view DAE's power programme of achieving 10000 MW by 2000 AD, NFC proposed in 1992 to set up three new plants at Hyderabad *viz.*, (i) New Uranium Oxide Fuel Project to produce pellets with a capacity of 670 tonnes at a cost of Rs.265.20 crore; (ii) New Zircaloy Fabrication Project with a capacity of 80 tonnes to produce fuel tubes/components at a cost of Rs.236.31 crore; and (iii) New Uranium Fuel Assembly Project to produce fuel bundles with a capacity of 600 tonnes at a cost of Rs.194.88 crore.

The original proposal to install an additional capacity of 600 tonnes per year of fuel bundles, in addition to the capacity of 300 tonnes per year in the existing CFFP, was scaled down to additional 300 tonnes per year in the Eighth Plan due to scaling down of nuclear power programme from 10000 MW to 2820 MW by 2000 AD because of financial constraints. An amount of Rs.190.02 crore was spent on these three projects upto March 1997. However, scrutiny in Audit revealed idle outlays due to lack of co-ordination and proper project planning as discussed in the succeeding paragraphs.

(a) New Uranium Oxide Fuel Plant

This plant was to produce pellets. The work on this plant was in progress and an expenditure of Rs.79.72 crore had been incurred as of December 1997. The plant was to be completed by December 1995. Even in the existing set up, production of pellets in the CFFP was much below the target and there was heavy rejection of pellets. In the absence of adequate production capability of pellets, the inter-related plants, New Zirconium Fabrication Plant and New Uranium Fuel Assembly Plant, though completed, could not start production.

(b) Idle outlay on New Zircaloy Fabrication Plant

This plant was to augment the production of fuel tubes. Fuel tubes produced in this plant were to be utilised only after the New Uranium Oxide Fuel Plant started producing pellets. Whereas work in this plant was

almost complete and was awaiting Atomic Energy Regulatory Board's certificate as of October 1997, the New Uranium Oxide Fuel Project was yet to be completed.

As mentioned earlier in *para 3.1.6*, the existing ZFP was under-utilised and had a large accumulated stock of fuel tubes. It was further noticed in Audit that if the existing ZFP could work at its maximum capacity of 80 tonnes, production of zircaloy fuel tubes would have been sufficient for production of 600 tonnes of fuel bundles in both the assembly plants, i.e. Ceramic Fuel Fabrication Plant and New Uranium Fuel Assembly Plant.

Therefore, establishing the New ZFP could have been postponed till the demand for fuel bundles was certain, and capabilities for production of zirconium sponge, a raw material for this plant, were created. With the project for 600 tonnes of zirconium sponge to be established at Palayakayal in Tamil Nadu not having taken off as of November 1997, there was no likelihood of availability of raw material for New ZFP. Thus both the backward as well as forward linkages were missing for this plant. This resulted in idle investment of Rs.69.51 crore on this plant.

(c) Idle outlay on New Uranium Fuel Assembly Plant

This plant was to produce fuel bundles. Its inputs were to come from the two plants, pellets from New Uranium Oxide Fuel Plant and fuel tubes from the New ZFP. Work in New Uranium Fuel Assembly Plant was completed at a cost of Rs.40.79 crore and certified by Atomic Energy Regulatory Board in January 1997 for commencement of production. However, the work on the New Uranium Oxide Fuel Project was still under progress as of December 1997. As a result, the investment of Rs.40.79 crore in New Uranium Fuel Assembly Plant would remain idle without any return, till the completion of New Uranium Oxide Fuel Project.

3.1.8 Demand for fuel bundles

The Nuclear Power Corporation of India Limited (NPCIL) had indicated their overall demand for fuel bundles for starting new atomic power plants.

Table in *para 3.1.5(b)* would indicate that the expected demand during 1994-97 had been much higher than the actual production of fuel bundles, which had not kept pace with the demand because of the continuance of bottlenecks in the existing CFFP and delay in the commissioning of New Uranium Oxide Fuel Plant. This might adversely affect the commissioning of power station by NPCIL, unless corrective action was taken in advance.

3.1.9 Zirconium Sponge and Titanium Sponge Project

In March 1989, DAE approved setting up of another Zirconium Sponge Project with a capacity of 600 tonnes for manufacture of solid aggregate of zirconium crystals at a cost of Rs.7 crore at Palayakayal. The output from this project *viz.* reactor grade zirconium sponge was to be the starting material for the New Zirconium Fabrication Plant. In January 1992, DAE also approved setting up a Titanium Sponge Project at Palayakayal with a capacity of 1000 tonnes per annum by co-location and integration of all facilities with the already approved Zirconium Sponge Plant at a total cost of Rs.90.65 crore. Titanium tubes are meant for use as heat exchanger and condenser applications.

Heavy expenditure of Rs.8.29 crore was incurred on project as of March 1997 and manpower provided even though a joint venture partner was yet to be located and technology for the project yet to be established

It was decided in November 1992 to implement these projects as a joint venture with Tata Oil Mills Company Limited. However, this joint venture did not materialise. As per the status report of April 1996, the setting up of the project had been deferred. NFC had spent Rs.8.29 crore on this project till March 1997.

It was observed in Audit that before incurring such heavy expenditure on land and its development, township, civil works, plant and machinery, utilities and services etc., no workable blue print was prepared for the execution of the project, such as tie-up with joint venture partners, technological capability to set up and commissioning of the project etc. resulting in the expenditure remaining unproductive. Out of the sanctioned staff of 19, 16 persons had been appointed for the project while the implementation of the project was still hanging fire.

Thus, the heavy expenditure on capital and idle manpower on the project had not yielded any tangible result rendering the expenditure of Rs.8.29 crore unproductive.

3.1.10 Arrears in preparation of accounts

Preparation of proforma accounts was in arrears from 1993-94 onwards

The activities of NFC, being in the nature of an industry, required preparation of proforma accounts to assess the working results and to know the true and fair state of affairs of the unit. However, the preparation of the proforma accounts was in arrears from 1993-94 onwards.

In the absence of up-to-date accounts, the working results and the financial position, essential to take management decisions were not available. As a result, the objective of the accounts as an aid to the management was defeated. The system of preparing quarterly/half yearly accounts and presenting them to NFC Board to know the trend of financial performance of NFC was also not in place, thus resulting in an inadequate Management Information System.

3.1.11 Irregular revision of production targets

DAE notified a scheme for payment of production linked bonus to NFC employees

DAE notified a scheme for payment of production linked incentive bonus to the employees of NFC in April 1993. The scheme which was effective from 1 April 1992, *inter-alia*, provided for fixing of annual targets of production of the saleable products of NFC by NFC Board. Although, bonus is normally payable only once a year, the scheme provided for calculation of bonus every month. For this purpose, the annual targets were split up into monthly targets and a slab system was introduced for calculation of monthly bonus. In order to be eligible to receive bonus, the employees had only to ensure that the production in a month exceeded 60 *per cent* of the monthly targets. Monthly production in excess of 60 *per cent* entitled the employees to higher amount of bonus as per the slab system. The scheme also contemplated revision of the targets, based on certain specified reasons.

There was a flaw in the scheme inasmuch as there was no obligation on the part of the employees to fully reach the annual targets so long as they

achieved more than 60 *per cent* of the monthly targets. During the last five years, the employees of NFC never succeeded in achieving the annual targets although they consistently received bonus upto 23 *per cent* during the period. It was also observed in Audit that NFC Board reduced the original targets for 1995-96 from 200 tonnes to 175 tonnes, after the close of the financial year, when the actual production was known, thus, making the employees eligible for higher bonus on the basis of slab system.

Retrospective revision of targets for reasons other than those provided in the scheme resulted in irregular payment of bonus of Rs.47.25 lakh

The revision of targets after the close of the financial year was irregular and also contrary to the spirit of any incentive scheme meant to achieve target production. This enabled the employees of NFC to receive bonus although the production was much less than the budgeted targets. This resulted in irregular payment of Rs.47.25 lakh to the employees during 1995-96.

The matter was referred to the Department in October 1997; their reply was awaited as of January 1998.

3.2 Loss resulting from non-recovery of dues

A decision taken by Heavy Water Plant, Baroda in 1984 to provide enhanced financial compensation, with retrospective effect from 1975, to Gujarat State Fertilizers Company towards process loss of ammonia synthesis gas in production of Heavy water, was not only at variance with an earlier decision of 1973, it also did not have the approval of DAE. This resulted in a loss of Rs.11.90 crore to the department upto March 1997.

The agreement of 1973 between DAE and GSFC provided for payment of the cost of one tonne of ammonia per day by the former to the latter

The Department of Atomic Energy (DAE) decided in July 1973 to set up an ammonia gas plant having a capacity of 50 tonnes per day for their Heavy Water Plant (HWP) at Baroda. The plant was set up adjacent to Gujarat State Fertilizers Company (GSFC) in order to integrate the plant with the latter's two ammonia plants already in existence. Integration of the plants was necessary for facilitating supply of gas to HWP for production of heavy water. As per agreement with GSFC, the ammonia gas

was to be returned to GSFC after processing water for extraction of heavy water. It was estimated that about one tonne of ammonia gas would be lost in the process of extraction of heavy water. Accordingly, DAE had agreed in 1973, to reimburse GSFC the cost of one tonne of ammonia per day to compensate them for the loss.

In their Action Taken Note, DAE offered no specific comment on whether it would initiate action for recovery of the excess payment made to GSFC

It was mentioned in para 3.11 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1988, No. 7 of 1989, Union Government (Scientific Departments) that contrary to the terms of the agreement, HWP authorities had agreed, in December 1984, to allow compensation for loss of five tonnes of ammonia per day, over and above one tonne already agreed to in 1973, without any formal amendment to the agreement or the approval of DAE. This decision of enhanced financial compensation of HWP was given retrospective effect from 1975. Defending their action, HWP took the plea that the original agreement of 1973 provided for loss of one tonne of ammonia per day on the basis of the indication given by the designers of the plant, a French consortium, though in practice it was difficult to contain the loss at that level. In their 'Action Taken Note', DAE had stated that they had not approved the minutes of the meeting held by HWP with GSFC in December 1984.

Ministry of Chemicals and Fertilizers clarified in December 1993/April 1996 that the production loss was already reckoned for fixation of support price and GSFC had no case for increased compensation

It was observed in Audit that in pursuance of the decision taken by HWP in December 1984, which was at variance with the agreement of 1973 and also not approved by DAE till date, GSFC adjusted Rs.11.90 crore from the dues payable to HWP for the period from 1975-76 to 1996-97. When the matter regarding admissibility of the adjustment was referred to DAE, the latter in consultation with the Ministry of Chemicals and Fertilizers, clarified (December 1993/April 1996) that the support price of GSFC was fixed on the basis of actual consumption of ammonia after reckoning the loss of ammonia gas in HWP and, therefore, there was no case for increased compensation to GSFC as that would amount to double payment.

The action of HWP authorities in agreeing to compensate a loss of additional five tonnes of ammonia per day over and above to what had been provided for in the agreement without asking the designers for a

remedy and also without obtaining the clearance of DAE was wrong, resulting in a loss of Rs.11.90 crore upto March 1997.

DAE's reply was not tenable

The Department stated, in October 1997, that although GSFC had unilaterally adjusted Rs.11.07 crore from the dues payable to HWP for the period 1975-76 to 1995-96 and continued to deduct the cost of 6 tonnes of ammonia per day in the subsequent years, HWP had nowhere agreed to this practice and had taken up the matter with GSFC to stop deduction on this account. The reply of the department was not tenable as these deductions were made by GSFC in pursuance of the HWP agreeing to this arrangement in December 1984 giving retrospective effect from 1975 and the department did not take any action to recover the amount from GSFC in spite of the irregularity having been pointed out by Audit in 1988-89.

3.3 Idle investment on purchase of an offset printing machine

Failure to install an offset printing machine since its acquisition in October 1991 resulted in idle investment of Rs.11.67 lakh for over six years.

DPS placed an order for supply of a particular model of printing machine for installation at BARC

The Directorate of Purchase and Stores (DPS) placed an order on M/s AM International INC, USA in December 1990 for supply of Multi-lith Offset Printing Machine - Model 1650 BCD, with spares, at a cost of US $ 26324.85. This was to be installed at the Library and Information Service Division of Bhabha Atomic Research Centre (BARC) to phase out 20 year old offset printing machine.

The model supplied by the firm was different from the model ordered

The consignment was received by BARC in October 1991 at a total cost of Rs.11.67 lakh. On opening the consignment in October 1991, the Indian agent discovered that his principal supplier had sent model 1962 XE instead of model 1650 BCD.

BARC took up the matter with the foreign supplier, who gave them the option (October 1991) to either return the complete machine for

replacement by model 1650 BCD or retain the model 1962 XE, erroneously supplied by them at no extra cost. The model 1962 XE was costlier than the model 1650 BCD. BARC accepted the later option in March 1992 and retained the machine.

BARC agreed to retain the erroneously supplied model

However, the machine could not be installed for want of response from the Indian agent for over two years. DPS noticed in September 1994 that the foreign firm had changed the Indian agent. In the opinion of new agent, the machine had a fault in its electrical circuit and the manuals received were also not for the machine accepted by BARC. He failed to rectify the defects as of August 1997.

BARC failed to get the machine installed by the firm or its agent since its purchase in October 1991

BARC had decided in December 1996 to install the machine departmentally but subsequently in September 1997, it was decided to entrust the work of installation and commissioning to another firm at a cost of Rs.0.13 lakh. However, the machine had not been installed as of December 1997.

Machine costing Rs.11.67 lakh was lying unused for over six years

Thus, failure of BARC to ensure installation of the offset printing machine resulted in the machine costing Rs.11.67 lakh purchased in October 1991 lying unused for over six years.

The Department of Atomic Energy stated, in December 1997, that the installation of the machine would be completed shortly. However, the fact remained that the printing machine was lying idle for over six years.

3.4 Avoidable purchase of drilling rods

Purchase of 500 drilling rods by AMD in July 1993, despite adequacy of stock, lacked justification. The purchase led to avoidable expenditure of Rs.12.66 lakh as the entire stock of drilling rods was lying unused as of March 1997.

Atomic Minerals Division (AMD) had 635 drilling rods in stock as of July 1993. Only 65 rods were consumed during the period July 1991 to June 1993. However, they placed a purchase order for 500 drilling rods at a cost

of Rs.12.66 lakh in July 1993 against which the supply was completed by December 1993. Audit scrutiny revealed that only 240 drilling rods were used between July 1993 and March 1997. Thus, the purchase order issued in July 1993 for 500 drilling rods, valued at Rs.12.66 lakh, lacked justification.

The Department while admitting the facts in December 1997, stated that it was not possible to exactly predict the requirement of the drilling rods. The reply was not tenable as AMD had earlier decided in August 1992 to shift the thrust of exploration to newly discovered sites in Sikar in North Rajasthan and Son Valley in Uttar Pradesh. Moreover, due to hard rock formation of these areas, conventional core drilling was needed which did not require use of these drilling rods.

3.5 Infructuous expenditure

Placement of purchase order for a Variable Speed Drive System before finalisation of its design parameters, resulted in an infructuous expenditure of Rs.30.14 lakh as the order had to be cancelled subsequently. It also attracted a claim of Rs.34.16 lakh in the form of accrued liability.

IGCAR placed an indent in December 1991 for procurement of Drive required for testing a Reactor

Indira Gandhi Centre for Atomic Research (Centre) placed an indent, in December 1991, with the Directorate of Purchase and Stores (DPS) under the Department of Atomic Energy (DAE) for procurement of Variable Speed Drive System (Drive) which was required for testing Prototype Fast Breeder Reactor (Reactor) having 4-loop Sodium Pumps. DPS issued a Notice Inviting Tender (NIT) in April 1992 for supply, erection and commissioning of the Drive.

AEC constituted a committee in July 1992 to reduce the overall cost of the Reactor

The Atomic Energy Commission constituted a Review committee in July 1992 to reduce the overall cost of the proposed Reactor as it was costlier than its thermal counterpart. The committee submitted its report in January 1993. Based upon the report, the Centre constituted a 'Task Force' in June 1993 to study the design of Reactor.

DPS placed purchase order before finalisation of the design parameters for the Reactor

While Task Force was yet to submit report, DPS obtained approval of DAE and placed a purchase order in January 1994 with Bharat Heavy Electricals Limited (BHEL), Bangalore for a Drive, designed for 4-loop Sodium Pumps, at a cost of Rs.3.26 crore. Against this order, the Centre made an advance payment of Rs.30.14 lakh to BHEL on 29 March 1994. Meanwhile, the Task Force had submitted its report on 22 March 1994 and had suggested certain changes in the design of the Reactor. In June 1994, DPS requested BHEL to hold up the work pending decision on the design of the Drive as the same was based upon the design of proposed Reactor. The Centre reviewed the report of Task Force in July-August 1994 and cancelled the purchase order in October 1994.

Cancellation of order attracted damages of Rs.64.30 lakh

BHEL submitted a claim on 7 January 1995 of Rs.64.30 lakh towards compensation for work done on the project engineering, equipment, tendering and payments made to sub-contractors. BHEL demanded balance payment of Rs.34.16 lakh after adjusting the advance of Rs.30.14 lakh. The balance payment of Rs.34.16 lakh was yet to be made to BHEL (November 1997).

Scrutiny by Audit in May 1996-97, revealed the following lapses:

(i) DAE and the Centre were aware that the financial sanction for Reactor was expected not before the year 2001-02. Also, the Planning Commission had not approved the proposal. The haste in placing the indent for the drive was unwarranted since a period of 12-15 years was required for building the proposed Reactor, whereas the Drive could have been manufactured within a period of only 21 months. Had they done proper project planning, the expenditure of Rs.64.30 lakh could have been avoided.

(ii) There was lack of co-ordination between the Centre and DAE. They did not ask DPS to go slow on the purchase process of Drive till final decision on design parameters of Reactor was taken. Besides, the Centre did not stop advance payment of Rs.30.14 lakh made by DPS on 29 March 1994 though the Task Force had already submitted report on 22 March

1994. The action taken to cancel the purchase order in October 1994 due to change in the design of Reactor was too late.

Cancellation of order renders the expenditure of Rs.30.14 lakh infructuous besides accrued liability of Rs.34.16 lakh

Thus, placement of the purchase order for the Drive before finalising the design parameters of the Reactor and also considering that the Drive was not even required immediately not only rendered the payment of advance of Rs.30.14 lakh as infructuous but also attracted an additional claim of Rs.34.16 lakh from BHEL in the form of accrued liability. The Centre accepted the facts in May 1997.

The matter was referred to the Department in August 1997; their reply was awaited as of January 1998.

Chapter 4 : Department of Biotechnology

4.1 Avoidable expenditure due to failure to maintain required power factor

Failure to install appropriate apparatus for maintaining the prescribed power factor resulted in avoidable penalty amounting to Rs.14.67 lakh.

NII entered into an agreement with DESU which stipulated payment of penalty in case of failure to maintain power factor of 0.85

National Institute of Immunology (NII), New Delhi entered into an agreement with erstwhile Delhi Electric Supply Undertaking (DESU), now Delhi Vidyut Board (DVB), for electricity load of 888 KW in April 1986. In terms of the agreement, NII was to maintain a minimum power factor of 0.85, if need be, by installing at its own cost, a suitable apparatus like capacitor panel of design as approved by DESU. The agreement also provided for upward adjustment of the power bills in the event of failure of NII to maintain the required minimum power factor.

Failure of NII to maintain the power factor because of delay in installing capacitors panel costing Rs.1.62 lakh resulted in payment of penalty of Rs.14.67 lakh

A review of the payments made to DESU for consumption of power between April 1992 to August 1996 revealed that NII failed to maintain the required minimum power factor, owing to non-installation of capacitor panel for this purpose and had to pay penalty totalling Rs.14.67 lakh. Though DESU had started imposing penalty since April 1992, NII appointed an expert committee nearly a year later in March 1993 to tackle this problem. Rather than tackling this problem immediately, NII included this as a part of their programme for upgrading the entire electrical system which was completed in November 1996 at a total cost of Rs.61.68 lakh. Of this, only Rs.1.62 lakh were incurred towards installation of capacitors panel. In the interim period, NII continued to pay penalty as demanded by DESU (now DVB) through monthly bills.

The Department stated in September 1997 that ever since the problem manifested itself, the Institute made efforts to tackle the same and was successful for about two years with in-house measures adopted and took action in time to take necessary measures. However, the fact remained that

if the installation of capacitors panel for which only Rs.1.62 lakh were required was not linked with the overall upgradation plan and was done early, payment of penalty of Rs.14.67 lakh could have been avoided.

Chapter 5: Department of Electronics

5.1 Research and development projects having import substitution as a component

5.1.1 Introduction

Department of Electronics (DOE) was constituted in February 1971 as an executive agency for performing secretariat functions and implementing the policies laid down by the Electronics Commission. Consequent upon winding up of the Electronics Commission in May 1989, the responsibility of policy making also devolved on DOE. The import substitution, a priority area in the past, continued to be identified as one of the components of various R&D projects by DOE during the Eighth Plan period 1992-97.

5.1.2 Scope of Audit

This review contains outcome of the test check of records relating to those R&D projects, funded by DOE during 1992-97, which specifically included import substitution as a component as these were expected to throw up economic benefits. For this purpose, records relating to the following five advisory councils of DOE that were entrusted with technology development, strategic electronics, micro-electronics, photonics development and electronics material development etc., were examined in Audit :

(i) Technology Development Council (TDC)
(ii) National Radar Council (NRC)
(iii) National Micro-Electronics Council (NMC)
(iv) Electronics Material Development Council (EMDC)
(v) National Photonics Council (NPC)

Each of these Councils planned activities falling within its purview and had separate budget for funding R&D activities.

5.1.3 *Highlights*

- **In three projects involving Rs.113.80 lakh, the expenditure was rendered unfruitful as the department could not utilise research results.**

{Para 5.1.4 (a)}

- **In two projects involving Rs.17.36 lakh as grant and Rs.72.00 lakh as loan, the expenditure was rendered infructuous due to non-achievement of expected results. Besides, entire loan amount with interest was yet to be recovered from MACE and BEL.**

{Para 5.1.4 (b)}

- **Out of 31 (other than two shortclosed) R&D import substitution projects, completed at a cost of Rs.873.34 lakh, only 10 were transferred to industry and in four cases, transfer of technology was in pipeline. In 17 cases, completed at a cost of Rs.374.75 lakh, no action was initiated by DOE to transfer the technology. Out of 10 import substitution projects transferred to the industry, only five could be commercialised. DOE had not done any survey to collect details of actual savings in foreign exchange as a result of import substitution projects.**

(Para 5.1.5)

5.1.4 *Import substitution projects*

A review of import substitution projects (ISPs), pursued by DOE during 1992-97, was conducted to evaluate the achievement of this objective in particular. Relevant records were examined to ascertain the extent to which DOE funded projects were successful in developing import substitutes/savings of foreign exchange by transfer and commercialisation of the technologies. NMC, EMDC and NPC did not undertake any import substitution project during 1992-97. Audit examination in respect of two Advisory Councils (TDC and NRC) revealed as under :

(a) TDC released grants of Rs.475.47 lakh for 23 import substitution projects, including eight projects sanctioned during earlier Plan periods. Of these, 12 projects including seven continuing from last Plan involving cost aggregating Rs.190.99 lakh were completed and one project costing Rs.3.00 lakh was shortclosed. It was noticed that nine projects were completed six to 45 months behind schedule with three of them exceeding cost estimates by Rs.11.88 lakh (21.94 *per cent*). Of the remaining 10 projects that were continuing, six were behind schedule by three to 60 months as of March 1997. DOE stated, in December 1997, that mobility of technical personnel of the projects, institutional procedures, delay in imports and other unforeseen factors hampered the time target.

Nine projects funded by TDC group were completed after time overrun of six to 45 months. Cost overrun in three projects was Rs.11.88 lakh

On test check, unfruitful expenditure aggregating Rs.113.80 lakh was noticed in the following three cases which had import substitution as one of the components:

(i) For developing hardware to reduce dependence on foreign multinational corporations, achieving import substitution and help film studios to gain freedom from heavy maintenance liabilities, DOE approved financial support of Rs.77.00 lakh over a period of three years to Centre for Development of Imaging Technologies (C-DIT) in December 1988. The support was provided through Electronic Research and Development Centre (ERDC), Thiruvananthapuram, which was also to provide technical assistance and necessary R&D in electronics related equipment. The proposal was sanctioned without following the usual appraisal mechanism, without having complete details about the project and without looking into the question of potential market for the product. An amount of Rs.70.50 lakh was released by DOE between March 1989 and September 1992 to C-DIT. The project was not successful and a Review Committee recommended closure of the entire project in October 1994 on the ground that the technology had become outdated.

DOE approved the project without following the usual appraisal mechanism, complete details about the project and looking for potential market for the product

Thus, sanction of project without proper appraisal, without ascertaining potential market for the product and failure to act upon the recommendation of the Review Committee for transfer of equipment along

DOE's failure to properly appraise the project rendered the expenditure of Rs.70.50 lakh unfruitful as the technology had become outdated

with associated software and other engineered prototypes to ERDC, resulted in unfruitful expenditure of Rs.70.50 lakh on the project.

DOE stated, in December 1997 that C-DIT had requested it to extend the project till March 1998 to achieve the fruitful output.

(ii) DOE sanctioned a project of 18 month duration for developing digital mobile radio communication system to Electronic Research and Development Centre (ERDC), Pune in November 1993. Out of the total project cost of Rs.90.00 lakh, DOE was to fund the project to the extent of Rs.30.00 lakh which were released during April 1994 to March 1996. The project, once completed, was expected to save several million rupees in foreign exchange. While the project was in progress, DOE transferred the services of ERDC project staff to Centre for Electronics Design and Technology (CEDT), Aurangabad on their merger in September 1995. Observing that subsequent to the merger, the project was not making proper progress, the Steering Committee in its fourth meeting held in September 1996 recommended extension of the project upto October 1996 with additional funding of Rs.3.40 lakh. A team of officers, deputed by DOE in May 1997 to review the project, was doubtful about relevance of the project in the fast changing scenario and suggested closure of the project. DOE was yet to take a decision about the fate of the project.

The failure of DOE to workout clear cut modalities at the time of merger, rendered the expenditure of Rs.33.40 lakh unfruitful

Thus, inability of DOE to work out clear cut modalities for completion of the project at the time of merger of ERDC with CEDT delayed development of prototype of digital mobile radio communication system even after time overrun of two years. As a consequence, the expenditure of Rs.33.40 lakh on the project remained unfruitful and did not result in any saving of foreign exchange. DOE stated, in December 1997 that 70 *per cent* of work was completed and for remaining 30 ***per cent*** of activity, DOE was considering to bring the product to the market through Electronics Research and Development Centre (ERDC), Thiruvananthapuram or Punjab Wireless, Mohali.

(iii) To develop multi-layer chip inductor components using thick film technology for composite component like transformers, DOE sanctioned a

project to Indian Institute of Technology, Delhi (IIT) in March 1993 at a cost of Rs.9.90 lakh for two years (later extended by one year upto 31 March 1996). Rs.9.90 lakh were released during March 1993 to February 1995. While submitting Interim Technical Report (ITR) in July 1996, the Project Investigator sought sanction for second phase pointing out that some more investigations remained to be carried out. In the original proposal there was no indication about the second phase investigations. No decision was taken by DOE on the request of the Project Investigator. No efforts were made by DOE for evaluation of the ITR or for utilisation of the research results as of December 1997.

Non-utilisation of research results for commercial exploitation rendered the expenditure of Rs. 9.90 lakh unfruitful

DOE stated, in December 1997, that funding of second phase for commercialisation of the product was being considered by them. Thus, the outcome of the project on which expenditure of Rs.9.90 lakh was incurred by DOE remained unexploited rendering the expenditure not yielding any tangible benefit.

(b) NRC released grants to R & D institutes of Rs.203.97 lakh during 1992-97 for 23 import substitution projects, including Rs.120.26 lakh for 16 projects sanctioned during the previous Plan periods. During 1992-97, 17 projects including 15 of those initiated during the earlier Plan periods and two relating to Eighth Plan, were completed. One project involving cost of Rs.42.36 lakh was prematurely closed. The remaining five projects having outlay of Rs.58.77 lakh were continuing as of December 1997. Of the completed projects, 15 were found to have overshot the time limit by three to 54 months.

15 projects supported by NRC completed after time overrun of three to 54 months

In the following two projects supported by NRC, expenditure of Rs.17.36 lakh was rendered infructuous and loan of Rs.72.00 lakh remained un-recovered as given below:

(i) For designing and developing low power radar for fishing trawlers, DOE sanctioned a project in January 1990 costing Rs.42.36 lakh and released Rs.17.36 lakh in the same month as grant and Rs.25.00 lakh as loan to Marine and Communication Electronics India Limited, Vishakhapatnam (MACE).The project was to be completed within 30

Despite there being no tangible progress noticed, the project was extended from time to time for five years. The short closure had rendered the expenditure of Rs.17.36 lakh infructuous and loan of Rs.25 lakh was yet to be recovered from MACE

months. DOE granted extension to the project from time to time before finally deciding in June 1995 to short-close the project as there was no progress in the project and also in view of failure of MACE to respond to its recommendations to complete the project. DOE also decided to recover the full amount of the support from MACE. However, Advisor, NRC deferred the recovery by stating that this may be kept in view while considering any further financial releases to MACE on any other project.

DOE stated, in December 1997 that since there was no tangible progress reported in the project in spite of the various recommendations of Project Review and Steering Group (PRSG), it was decided to short close the project. As a result, the grant of Rs.17.36 lakh released to MACE was rendered infructuous besides eliminating the prospects of saving foreign exchange to the tune of Rs.6.00 crore. Loan of Rs.25.00 lakh with interest, which was recoverable by July 1994, was not recovered from MACE as of December 1997.

The research result achieved was not as per project proposal and the outcome of the project did not reduce dependence on import of the system. The loan of Rs.47 lakh was yet to be recovered from BEL

(ii) To save foreign exchange to the tune of Rs.200.00 crore over a period of five years, DOE released a loan of Rs.47.00 lakh between March 1991 and May 1992 to Bharat Electronics Limited (BEL) for development of computer generated visual system within a period of three years. The project was completed in March 1994. The status report of NRC for August 1996 showed that BEL had developed visual database generation software with editing functions and library creation facility. There was nothing on the records of DOE to indicate that BEL was successful in developing the computer generated visual system as planned under the project.

DOE replied, in December 1997, that the project had met all the objectives envisaged in the project proposal. However, the fact remained that BEL was successful only in developing a visual database generation software and not the computer generated visual system and that the outcome of the project did not help in reducing dependence on import of the system as envisaged in the project proposal. Besides, loan of Rs.47.00 lakh with interest, which was recoverable by March 1996, was not recovered from BEL as of December 1997.

5.1.5 *Technology development, transfer and commercialisation*

Despite having made projections in the Eighth Plan document, the various Councils of DOE accorded low priority to import substitution projects as demonstrated by the number of projects undertaken and quantum of funding during 1992-97. The impact of lack of focused planning of import substitution projects was also reflected in the small number of technologies developed and commercially exploited by DOE as depicted in the following table:

(Rs. in lakh)

Name of Council	Import Substitution Projects									
	Completed		Transferred to Industry out of (2)		Commercialised out of (3)		Technology in pipeline out of (2)		Follow up action awaited out of (2)	
1	2		3		4		5		6	
	No.	Cost	No.	Cost	No.	Cost of production	No.	Cost	No.	Cost
TDC	12	190.99	4	86.30	2	330.00	3	34.65	5	70.04
NRC	17	646.21	6	340.54	3	278.00	1	37.10	10	268.57
NMC	02	36.14	-	--	-	--	-	--	2	36.14
EMDC	--	--	-	--	-	--	-	--	-	--
NPC	--	--	-	--	-	--	-	--	-	--
Total	31	873.34	10	426.84	5	608.00	4	71.75	17	374.75

Out of 12 completed projects supported by TDC, commercialisation took place only in two and no action was taken by DOE to transfer the know-how in five cases

(a) 12 import substitution projects funded by TDC involving expenditure of Rs.190.99 lakh were completed during 1992-97. Of these, DOE succeeded in transferring the technology only in four cases involving cost of Rs.86.30 lakh. While transfer of technology was in pipeline in three cases involving cost of Rs.34.65 lakh, in three other cases involving cost of Rs.49.53 lakh, no action was taken by DOE though these were developed between June 1995 and December 1996. In the remaining two cases having outlay of Rs.20.51 lakh, the Project Investigator had approached DOE in May and July 1996 for funding second phase for further development but action on the part of DOE was awaited as of December 1997. Out of the four technologies transferred, only two were commercialised. For these four technologies, anticipated foreign exchange savings were Rs.22.64 crore over a period of four to five years against which commercialisation of two technologies mentioned above resulted in production worth Rs.3.30 crore as of August 1996. DOE stated, in December 1997 that technology transfer in three cases was under discussion for commercialisation and in

respect of two projects, recommendations of respective Councils and Working Groups were awaited for clearance of second phase activity.

Out of 17 completed projects funded by NRC, commercialisation took place in three cases and no action was taken to transfer the know-how in ten cases

(b) Out of 17 import substitution projects funded by NRC that were completed at a cost of Rs.646.21 lakh, technology transfer was effected in six cases involving cost of Rs.340.54 lakh. In 10 cases involving cost of Rs.268.57 lakh, no action was initiated by NRC for technology transfer, whereas, in one case having cost of Rs.37.10 lakh, action was underway as of July 1997. Out of the six technologies transferred, only three could be commercialised resulting in production worth Rs.2.78 crore as of August 1996 as intimated by DOE.

DOE stated, in December 1997, that the remaining projects which could not be commercialised belonged to the category of techniques/technology development projects. Such projects improved the techniques/ technology for indigenous production. However, as the DOE had not been monitoring indigenous production levels in related industry, whether these projects helped in improving the techniques/technology for indigenous production could not be ascertained.

DOE had not done any survey to collect details of actual savings in foreign exchange out of ISPs

(c) Though project proposals visualised foreign exchange savings as one of the benefits flowing from import substitution projects, DOE had not done any survey to collect details of actual savings in foreign exchange that could be attributed to the outcome of such projects as of July 1997.

Details of premium and royalty received in respect of ten technologies transferred not available with DOE

(d) The details of premium and royalty received by DOE in respect of the 10 technologies transferred to industry during 1992-97 were not available on its records except for two cases. In these cases too, out of Rs.10.00 lakh agreed as technology transfer fee, DOE received Rs.2.25 lakh only in one case and allowed the executing agency in the other case to retain the technology transfer fee of Rs.6.00 lakh. The remaining amount of Rs.1.75 lakh was yet to be recovered by DOE.

DOE stated, in December 1997 that R&D projects did not have the provisions for premium and royalty for transfer of technology. Necessary follow up action was being carried out to recover the amount of Rs.1.75

lakh. The reply of DOE was not tenable as the conditions governing grants-in-aid provide that any receipt by way of sale of know-how, royalties etc., shall accrue to the Government.

To sum up, out of the 31 projects (excluding two short-closed) completed at a cost of Rs.873.34 lakh, action for transfer of technology was not initiated by DOE in 17 cases (Rs.374.75 lakh) and only five projects could lead to commercialisation of technology. Thus, the value for money was not achieved and impact of the outcome of these import substitution projects, which in normal course would have multiplier effect on production and savings in foreign exchange, was insignificant.

Chapter :6 Department of Space

6.1 Avoidable expenditure

An additional expenditure of Rs.10.32 lakh was incurred on air-lifting part of a consignment on the ground of urgent requirement. However, due to delay in ordering and subsequent delay in opening of letter of credit, the purpose was defeated.

Vikram Sarabhai Space Centre (Centre), Thiruvananthapuram raised an indent in November 1993 for supply of 40 aluminium alloy plates for fabrication of fins for Geosynchronous Satellite Launch Vehicle. Against a limited tender enquiry from 14 suppliers in December 1993, four firms gave their offers in January 1994. Although the tenders were evaluated in February 1994, the recommendation for purchase was communicated to the Purchase Officer two months later in April 1994. As part of the supply was stated to be required urgently, the Centre decided in May 1994 to air-lift 10 plates. The balance quantity was ordered to be despatched by sea. The Centre took another two months to place the purchase order valued at DM 205632 (equivalent to Rs.37.47 lakh) FOB in July 1994. The supplies were to be completed before 31 October 1994.

The supplies were to be covered by Mill test certificates evidencing details of chemical, mechanical, metallurgical, ultrasonic, visual and dimensional inspection by a pre-determined third party.

However, as the question of testing of these plates could not be resolved with the supplier till November 1994, the letter of credit could be opened only in January 1995. The first consignment of 10 plates, which were air-lifted, reached Bangalore airport in April 1995 only. An amount of Rs.10.65 lakh was paid as air freight and the consignment was cleared in June 1995. The other consignment of 30 plates, despatched by sea arrived shortly thereafter in May 1995 and the same was cleared in July 1995. All plates received through air and sea were inspected simultaneously on 1 August 1995 and issued in the same month.

Evidently, there was no urgency for getting the first lot of 10 plates air-lifted. Though the urgency was felt in May 1994; orders were placed in July 1994 and the letter of credit could be opened in January 1995 only. The Centre could have reviewed the urgency in January 1995 and modified the order. The misplaced urgency resulted in an additional expenditure of Rs.10.32 lakh on 10 plates being the difference between air freight and the sea freight on pro-rata basis.

The Department stated, in November 1997, that expenditure incurred on air-lifting 25 *per cent* quantity of plates could not be construed as avoidable as the material received by air had helped the project considerably in planning the machining schedules of these plates and development of fin structures. The reply was not tenable in view of the fact that all the plates received through air and sea were inspected simultaneously on 1 August 1995 and were issued in the same month.

6.2 Overpayment due to change in notation of currency

Liquid Propulsion Systems Centre, Valiamala made payment to a foreign firm, by opening an LC for Pound Sterling 200709 instead of US Dollar 200709 resulting in overpayment of Rs.34.91 lakh to the firm.

LPSC placed an order on a foreign firm for supply of forging at a cost of US $ 200709 but established the LC in pound sterling for £ 200709

Department of Space issued a sanction for US $ 206499.67 (equivalent to Rs.65.27 lakh) in January 1995, for import of Titanium Alloy Forging from United Kingdom (UK). Liquid Propulsion Systems Centre (LPSC), Valiamala, placed a purchase order in February 1995 on M/s Hi-tech Alloys Limited, UK at a cost of US $ 200709. A letter of intent (LOI) was issued in January 1995 and accepted by the firm in March 1995 for US $ 200709. The Purchase Section of LPSC sent a requisition in June 1995 to the Accounts Section for opening a Letter of Credit (LC) for Pound Sterling 200709 instead of US $ 200709. Based on the LC application sent by the

Accounts Section, the State Bank of India (SBI), Valiamala established a LC in June 1995 for £ 200709 equivalent to Rs.102.08 lakh.

The firm received payment in pound sterling from SBI for which LPSC released Rs.103.03 lakh against the budget provision of Rs.65.27 lakh

The foreign supplier presented the bill in pound sterling at SBI, London in July 1995 and the latter released the payment. On receipt of invoice and shipping documents from SBI London, SBI Valiamala preferred the claim on LPSC in August 1995. Against the budget provision of Rs.65.27 lakh, LPSC paid Rs.103.03 lakh, including bank charges, interest and commission to SBI, Valiamaia. The facts were not reported to higher authorities. The foreign supplier declined in September 1995 to refund the excess payment received by them. Thus, the administrative lapses on the part of LPSC led to overpayment of Rs.34.91 lakh to the foreign firm.

The change in notation by Purchase Section remained undetected by the Accounts Section

It was seen in Audit that the excess payment occurred due to a change in notation of currency (i.e., £ instead of $) by the Purchase Section in the advice sent to the Accounts Section for opening of LC. The change in the notation remained undetected by the Accounts Section at the time of opening of LC. This was primarily due to the absence of check list system in the Purchase/Accounts Sections. Both the Sections failed to detect the lapse at every stage of the transaction.

Departmental enquiry against the involved officials not concluded

In order to identify the administrative lapses and find out whether any *prima facie* case existed for appropriate action, a preliminary enquiry was ordered by DOS in September 1995. On the basis of the preliminary enquiry, departmental proceedings were initiated against the officials involved. The proceedings had not been completed as of October 1997.

The Department admitted, in December 1997, that there was a lapse on the part of some officers and staff of LPSC, against whom disciplinary action was being expedited. It was further stated that action was on hand for filing a complaint for criminal breach of trust against the firm with the police authorities in London. However, the fact remained that instead of taking immediate action, the department had already delayed the matter by about two and a half years as of January 1998.

Chapter 7 : Department of Science and Technology

7.1 Excess payment of Customs duty

Payment of Customs duty at higher rates resulted in excess expenditure of Rs.16.95 lakh.

IMD placed order for supply of 25 compact facsimile recorders on a USA based firm for use at SDUCs for recording satellite images of clouds

India Meteorological Department (IMD) placed an order in February 1994 on M/s Alden International Inc., USA for supply of 25 "Alden Model 9315TRT-128 compact facsimile recorders" (Recorder), including spares and accessories, at a cost of US $ 2,34,126.40 equivalent to Rs.73.87 lakh. These facsimile recorders, using thermal paper, were required for capturing cloud images received by IMD, New Delhi through INSAT-1 satellite and re-transmitted to 23 Secondary Data Utilisation Centres (SDUC) located all over the country. One recorder was received in April and the remaining 24 in August 1994.

Assessment of Customs duty at rates higher than the prescribed ones, resulted in overpayment of Rs.16.95 lakh

These recorders were classifiable under sub-heading 9015.80 in Section XVIII of the First Schedule to the Customs Tariff Act, 1975 (the Schedule) and attracted basic Customs duty @ 60 *per cent* and additional Customs duty @ 10 *per cent*. One recorder, received in April 1994, was wrongly classified under sub-heading 8471.10 by Customs House Agent appointed by IMD. This sub-heading 8471.10 covered hybrid automatic data processing machines and attracted basic Customs duty @ 65 *per cent* and additional Customs duty @ 15 *per cent*. This resulted in excess payment of Rs.0.38 lakh as Customs duty. The balance of 24 recorders received in August 1994, were correctly classified under sub-heading 9015.80 but basic Customs duty and additional Customs duty were paid at 65 *per cent* and 20 *per cent* respectively against the applicable basic Customs duty of 60 *per cent*, and additional Customs duty of 10 *per cent*. This resulted in excess payment of Custom duty of Rs.16.57 lakh because of application of wrong rates. Thus, an excess payment of Rs.16.95 lakh on Customs duty was made on import of 25 recorders.

The Department stated, in August 1997, that Customs duty was paid according to the verification of the Bill of Entry by Customs officials and

the issue for refund of excess Customs duty would be taken up with the Customs authorities. However, the proposed action of IMD to prefer refund claim with the Customs authorities was too late in view of the limitation period of one year prescribed under the Customs Act for such refunds.

7.2 Avoidable expenditure

Failure to take timely action to reduce the maximum contract demand for power consumption and to maintain the power factor to the prescribed limit resulted in avoidable payment and penalty of Rs.12.97 lakh.

MSEB increased the power load from 175 KW to 400 KW in June 1993 on request of the Department

The Additional Director General of Meteorology (Research), India Meteorological Department (IMD) Pune, approached Maharashtra State Electricity Board (MSEB) in April 1992 to increase the power load from 175 KW to 400 KW to meet the additional power requirement because of expansion of their computer system and air conditioning plant. Accordingly, MSEB increased the power load to 400 KW with simultaneous increase in maximum contract demand to 425 KW in June 1993.

Conditions for supply of power provided for minimum payment on 75 *per cent* of the contract demand

The terms and conditions of power supply by MSEB, *inter alia*, stipulated that the consumer would be charged a minimum of 75 *per cent* of the maximum contract demand.

Consumption of power was far below the contract demand

Excess payment of Rs.5.42 lakh was made without consumption of power

It was observed in Audit that maximum established monthly demand for the period during June 1993 to March 1997 was far below the contract demand of 425 KW and varied between 166 KW and 280 KW (except 24 KW in July 1993). Yet, IMD had to pay demand charges on 319 KW (75 *per cent* of the contract demand). This resulted in an avoidable excess payment of Rs.5.42 lakh, representing demand charges on the power not actually consumed during June 1993 to March 1997.

The terms and conditions of power supply by MSEB also stipulated maintenance of minimum monthly power factor of 0.90 by installing capacitors. In the event of the actual power factor being less than the prescribed standard, penalty at the rate of one *per cent* of monthly energy bill for every 0.01 fall in power factor was to be levied.

IMD installed capacitors in January 1997 at the instance of Audit. Delay on the part of IMD for installation of capacitors resulted in imposition of penalty of Rs.7.55 lakh

In spite of the penal provision in the agreement, the department did not take effective action for installation of capacitors for maintaining the required power factor till it was pointed out by Audit in September 1996. The capacitors were installed in January 1997 at a cost of Rs.1.52 lakh. The delay in installation of capacitors resulted in the department making payment of Rs.7.55 lakh as penalty to MSEB during May 1991 to January 1997.

Extra expenditure and penalty were avoidable

Thus, failure of the Department to take timely action to reduce the contract demand for power and to install capacitors for improving the power factor resulted in avoidable payment of Rs.12.97 lakh, including penalty of Rs.7.55 lakh.

Department's contention that power requirement was low as all the expansion schemes were not through, was not tenable

The Additional Director General of Meteorology (Research), Pune stated, in June 1997, that the additional power load was worked out keeping the future expansion schemes in view. As many of those schemes were still under consideration of the department, it could not utilise the full quantum of power. It was further stated that MSEB had been requested in February 1997, to reduce the power load from 400 kw to 250 kw. Their reply was contradictory as they could have taken action for reduction of power load much earlier. Moreover, it failed to install the capacitors immediately on noticing the fall in the prescribed power factor. They also failed to realise the fact that the cost of installation of capacitors would be much less than the amount of cumulative penalty.

The matter was referred to the Department in August 1997; their reply was awaited as of January 1998.

Chapter 8 : Indian Council of Agricultural Research

8.1 Inventory management in Institutes of Indian Council of Agricultural Research

8.1.1 Introduction

The Indian Council of Agricultural Research (ICAR), New Delhi is an apex organisation at national level for promotion of science and technology programmes in the areas of agricultural research and education.

The research set-up includes 49 institutes, each headed by a Director, who is assisted in the discharge of his responsibilities by a Board of Management/ Management Committee. Matters regarding inventory are dealt with by stores and purchase wings of individual institutes and the powers for sanction relating to purchase of material and equipment are vested in full with the heads of the institutes.

8.1.2 Scope of Audit

The present review examines the issues relating to management of inventory in ICAR's institutes during 1991-97. For this purpose, the following 11 out of 49 institutes of ICAR, dealing with scientific research in diverse fields of agriculture and animal husbandry, were selected for test check by Audit.

1. Indian Veterinary Research Institute (IVRI), Izatnagar, U.P.
2. National Bureau of Animal Genetic Resources (NBAGR), Karnal.
3. Indian Grass Land and Fodder Research Institute (IGFRI), Jhansi.
4. Indian Agricultural Statistical Research Institute (IASRI), New Delhi.
5. Indian Agricultural Research Institute (IARI), New Delhi.
6. Indian Institute of Sugarcane Research (IISR), Lucknow.
7. Central Institute of Sub-Tropical Horticulture (CISH), Lucknow.
8. National Bureau of Plant Genetic Resources (NBPGR), New Delhi.
9. Directorate of Wheat Research (DWR), Karnal.

10. Central Institute for Research on Buffaloes (CIRB), Hisar.
11. Central Sheep and Wool Research Institute (CSWRI), Avikanagar , Rajasthan.

8.1.3 Highlights

- **Purchases totalling Rs.1.30 crore were made without inviting open tenders, though the value in individual cases exceeded Rs.50,000.**

  Import of stores and equipment on CIF basis and payment of agents commission in foreign exchange caused avoidable outflow of foreign exchange equivalent to Rs.40.46 lakh.

  Purchase of equipment valuing Rs.55.40 lakh made after closure of the projects resulted in their non-utilisation for the specific purpose.

  (Para 8.1.4)

- **Equipment worth Rs.1.11 crore remained idle for 6 months to 12 years due to non provision of infrastructural facilities by the institutes in time, short supply of accessories, non availability of trained staff etc.**

  Installation of equipment worth Rs.6.99 crore was delayed for 6 to 36 months.

  (Para 8.1.5)

8.1.4 Acquisition of stores

(a) Non-preparation of purchase manual

The purchase manual of ICAR had not been prepared

In pursuance of recommendations of the Scientific Advisory Committee (SAC), ICAR constituted a committee for evolving suitable purchase procedure. The Committee, in March 1989, suggested a procedure for procurement of typewriters, duplicating machines, air conditioners, furniture, items of common nature, stationery and other stores. While circulating these recommendations in June 1989 for compliance by

individual institutes. ICAR had stated that a Stores and Purchase Manual would be prepared to enable the institutes to exercise enhanced powers in the matter of purchase and disposal of stores. However, the manual had not been prepared and issued as of July 1997. ICAR accepted the facts and stated, in November 1997, that a Stores and Purchase Manual would be prepared.ICAR also stated that guidelines for procurement of stores had since been issued to all its units.

(b) Purchases without inviting open tenders

Purchases valuing Rs.1.30 crore were made without invitation of open tenders in violation of rules

As per GFRs, purchases exceeding Rs.50,000 are required to be made through invitation of open tenders, except in special circumstances which are required to be recorded in writing. Test check of records disclosed that IARI, IISR, IASRI, CISH, CIRB, CSWRI, NBPGR and IVRI had made purchases aggregating Rs.1.30 crore without inviting open tenders, though the value in individual cases exceeded Rs.50,000.

IARI and CIRB did not furnish any reply, whereas IVRI accepted the facts. The other institutes stated, in November 1997, that such purchases were being made where the sources of supply were known to the institutes or the equipment were of proprietary nature or some exigency was involved. The reply was not tenable since the individual case files did not contain any justification for avoiding invitation of open tenders.

(c) Avoidable outflow of foreign exchange

Import of stores on CIF basis resulted in avoidable outflow of foreign exchange of Rs.28.70 lakh on insurance and freight charges

GFRs provide for import of stores and equipment on 'Free on board' (FOB) basis. Test check of records revealed that during 1991-97, purchases made on Cost, insurance and freight (CIF) basis by IARI, CSWRI, NBPGR, IGFRI and CISH resulted in avoidable outflow of foreign exchange equivalent to Rs.28.70 lakh on insurance and freight charges.

CSWRI, NBPGR, IGFRI and CISH accepted the facts, while IARI did not furnish the reply. ICAR stated, in November 1997, that audit observation had been noted for strict compliance and all ICAR units had been instructed to procure stores on FOB basis.

Payments of commission of Rs.11.76 lakh to Indian agents were made in foreign exchange

It was further observed that NBAGR, DWR and CIRB had established letters of credit for import of equipment valued at Rs.1.18 crore without deducting the amount of the commission payable @ 10 *per cent* to Indian agents. As a result, the payments equivalent to Rs.11.76 lakh were made to Indian agents in foreign currency.

NBAGR and DWR accepted the facts in November 1997, while CIRB did not furnish the reply.

(d) Unjustified expenditure on purchase of equipment after the closure of projects

The equipment costing Rs. 55.40 lakh were purchased after closure of the projects, thus not utilizing them for specific purpose

ICAR sanctioned, in June 1992, Part-II National Seed Project-III (NSP-III) titled "Strengthening of research capabilities for improvement, varietal testing and uninterrupted basic and breeder seed production", funded by World Bank, for a period of five years with effect from April 1992 with a financial outlay of Rs.2.37 crore for DWR at Karnal. Out of this, an amount of Rs.75.56 lakh was provided for purchase of equipment during 1992-94 for DWR, Karnal and its regional stations at Lahoul, Shimla and Wellington. As the funds could not be utilised during 1992-94 due to non-procurement of the sanctioned items, ICAR directed in September 1995, utilisation of funds positively before 31 March 1996 in view of the decision to close the project from 30 June 1996. Though the project terminated in June 1996, the purchase orders for equipment worth Rs.55.40 lakh were placed during June to August 1996 with stipulated dates of delivery between June to October 1996. As the equipment were purchased after completion of the tenure of the project and were not specifically utilized for the NSP-III project, the expenditure of Rs.55.40 lakh was unjustified.

The Directorate stated, in November 1997, that the equipment could not be procured in time due to lack of infrastructural facilities. The reply was not tenable as the absence of infrastructure needed for installation of the equipment was foreseeable at the time of sanctioning the project and there was no justification to make procurement of equipment after closure of the project. Moreover, DWR was silent on whether the equipment could be suitably utilized in future.

(e) Non-levy of liquidated damages

Liquidated damages amounting to Rs.6.25 lakh were not levied despite delay in supply of stores

The essential clause regarding levy of liquidated damages for failure to supply stores within the stipulated period was not incorporated in the tender documents/purchase orders in violation of the provisions of GFRs. Non-incorporation of the clause adversely affected financial interests of the institutes. Though supply of stores in some cases was delayed beyond five weeks from the stipulated delivery periods in five institutes, namely IARI, IASRI, CISH, IISR and DWR, liquidated damages of Rs.6.25 lakh @ two *per cent* per week subject to maximum of 10 *per cent* could not be recovered as a clause for levy of penalty was not incorporated in the purchase orders.

CISH, IISR and DWR accepted the facts in November 1997, while IARI did not furnish any reply.

8.1.5 Utilisation

(a) Idle equipment

It was observed that equipment worth Rs.1.32 crore was either not installed or used after installation for periods ranging from 6 months to 12 years due to reasons like absence of infrastructure, failure of Indian agents to install equipment, short supply of the items and inaction on the part of the institutes to take follow up action in such cases. Some of the cases are given below:

(i) Infrastructural facilities not ready

Lack of advance action for creating infrastructure resulted in idling of equipment costing Rs.28.14 lakh for 23 months

Water Technology Centre of IARI, New Delhi, procured three basic plant growth chambers from M/s Controlled Environment Limited, Canada in August 1995 at a total cost of Rs.28.14 lakh under National Agricultural Research Project. IARI, however, did not initiate advance action for installation. As a result, the plant growth chambers remained uninstalled for 23 months for want of infrastructural facilities, which were not ready as of July 1997. The project has already been closed on 30 June 1996. The institute admitted in November 1997 the adverse effect of non-installation on research activities.

(ii) ***Inaction of the Institutes***

DWR, Karnal procured one atomic absorption spectrophotometer from M/s GBC Scientific Equipment Private Limited, Australia in June 1994 at a cost of Rs.5.95 lakh. The equipment was installed in October 1994 but the same became non-functional in January 1995. The service engineer from the local agent could not make it functional as DWR had not procured some spares with the spectrophotometer which were essential for its smooth functioning. The equipment remained idle for 29 months as the spares had not been procured as of June 1997. DWR stated, in November 1997, that the spares had been procured and Indian agents were requested to depute their engineer to bring the spectrophotometer in working condition.

Failure to take timely action resulted in non-functioning of equipment worth Rs.82.81 lakh for 18 months to 12 years

Besides the above cases, equipment worth Rs.76.86 lakh were also lying idle since April 1985 to January 1996 for want of trained personnel, scientists on study leave and non- segregation of load by CPWD in NBAGR, IVRI, IARI, and IISR as given in Appendix-XV. The table includes idle equipment worth Rs.49.90 lakh pertaining to IVRI, Izatnagar which was commented upon earlier in the Report of Comptroller and Auditor General of India, Union Government (Scientific Departments), New Delhi for the year ended 31 March 1991. The institute had not taken any action to make them functional.

IARI did not furnish any reply, while IVRI and IISR accepted the facts in November 1997.

(b) ***Delay in installation of equipment***

Failure of NBPGR to make available prerequisites resulted in delay in installation of modules worth Rs.5.25 crore for 16 months

(i) Under the Indo-US PGR project being executed at NBPGR, New Delhi, M/s Blue Star Limited, sent eleven medium term storage modules valuing US $ 1497298 equivalent to Rs.5.25 crore to eleven institutes of ICAR during April to June 1996 to provide safe storage to maintain viability of germ plasm holdings for 5-10 years. Before despatch, NBPGR had requested the institutes in November 1995 to make available the pre-requisites for medium term storage modules. The institutes did not

complete the pre-requisites. Consequently, the modules were installed in November 1997. Thus, contrary to the objective, the institutes could not enhance the preservation capacity of germ plasm for 16 months. NBPGR admitted the facts in November 1997.

(ii) In 22 cases, equipment valuing Rs.1.74 crore purchased by CISH, IARI, DWR, NBAGR, CSWRI and IGFRI during 1991-97 were installed after considerable delay for period ranging from 6 to 36 months, due to delay in receipt of replacement for defective parts or delay in completion of infrastructure as given in Appendix-XVI. The warranty of 12 months had expired in 16 cases before installation of the equipment worth Rs.1.17 crore.

Equipment worth Rs.1.74 crore installed after 6 to 36 months

CISH, DWR, NBAGR and IGFRI accepted, in November 1997, the facts in eight cases.

(c) Non- maintenance of Assets Registers

All assets acquired out of government grants are required to be accounted for in the Assets Register in GFR-19. Except IVRI and DWR, none of the institutes test checked in Audit, had maintained Assets Registers. In the absence of these registers, the position of assets as shown in the annual accounts of the institutes could not be authenticated. ICAR failed to ensure adherence to the provisions of GFRs by the institutes.

In the absence of Assets Register the figures of assets shown in accounts could not be authenticated

NBAGR, IASRI, CISH and CSWRI stated that the work was in progress, while other institutes did not furnish any reply. ICAR stated, in November 1997, that instructions had again been issued to all institutes for maintaining the Assets Registers.

(d) Physical verification of stores

Physical verification of stores is required to be done annually to check shortages, misappropriation etc. It was observed that physical verification of stores of nine institutes was in arrears for 1 to 9 years. In the absence of physical verification, correctness of store's accounts could not be vouched for.

Absence of regular physical verification raised possibility of shortages, misappropriation of stores

IASRI, DWR, NBPGR and NBAGR stated that efforts were being made to get physical verification of stores done, while other institutes did not furnish any reply. ICAR stated, in November 1997, that the institutes had been asked to do the needful.

8.1.6 Unserviceable stores awaiting disposal

Unserviceable articles worth Rs.1.15 crore were lying in stores for the last 2 to 11 years

Stock articles having book value of Rs.1.15 crore were lying in stores of DWR, IARI, NBPGR, IVRI, IASRI, CISH, NBAGR and IGFRI in unserviceable condition for the last 2 to 11 years. No action had been taken to dispose them off. Delay in disposal of these unserviceable items might cause deterioration in their condition resulting in erosion in their salvage value besides wasting storage space.

DWR, NBPGR, IVRI, IASRI, CISH, NBAGR and IGFRI stated, in November 1997, that either the unserviceable stores had been auctioned or action had been initiated for their disposal. The reply was not tenable as it was not in the context of the cases pointed out by Audit.

8.1.7 Non-conducting of inspection by the internal inspection unit of ICAR

The internal inspection of institutes was in arrears since long

ICAR has an internal inspection unit for conducting internal inspection of its institutes. The internal inspection of DWR, Karnal and CISH, Lucknow had not been done since their inception and internal inspection in other institutes was in arrears for 6 to 19 years.

Many of the irregularities concerning inventory management could have been noticed earlier and necessary corrective measures taken, had such internal inspection been conducted periodically.

ICAR stated, in November 1997, that it was making special efforts to clear the backlog in respect of internal inspection.

8.2 Unfruitful expenditure on import of defective equipment

Import of defective equipment resulted in its non-installation for three years rendering an expenditure of Rs.13.98 lakh unfruitful.

CIFA placed order for supply of an equipment in March 1994

Central Institute of Freshwater Acqua-culture (CIFA), Bhubaneswar placed an order on a foreign firm for supply of 'Infratec Food and Feed Analyser' in March 1994 at a cost of Swedish Kronar (SEK) 385,966 equivalent to Rs.15.94 lakh. The equipment was to be used for monitoring the quality of input ingredients and end product feed in a feed mill which was to be established in CIFA. The equipment was specifically required for analysing the samples in large scale commercial feed production with the establishment of the feed mill.

Equipment received in July 1994 was found to be defective. The equipment remained un-installed as of September 1997

The equipment was received at Calcutta Airport by CIFA in July 1994 and 90 *per cent* payment of SEK 338,865.18 equivalent to Rs.13.98 lakh was released in September 1994. During the first visit of the Service Engineer in November 1994, the equipment could not be installed as its detector module was found defective. Replacement of the defective part, sent by the foreign supplier in January 1995, was cleared by CIFA in July 1995. In his technical report dated 13 July 1995, the service engineer desired procurement of different types of collars for getting the instrument operational. Though these were stated to be supplied by the service engineer free of cost, the equipment could not be installed. Subsequently, in November 1996, a problem in another component of the equipment was discovered by the service engineer. The Indian agent, thereafter, intimated CIFA in February 1997 that the equipment was to be sent back to the factory on 'freight-to-pay basis' for check-up, rectification and return. Though a decision in principle has been taken to send the equipment back to the principal's factory in Sweden on 'freight-to-pay basis', it had not been sent as of September 1997. Consequently, the equipment had remained un-installed as of September 1997. The warranty of the equipment had also expired in January 1996.

Feed mill was established in February 1997, but no samples could be analysed, thus defeating the objectives

Meanwhile the feed mill, for which the equipment was purchased in 1994 by CIFA, had been established in February 1997. Till September 1997, no samples from the feed mill had been analysed. Consequently, the objective of analysing the samples in large scale commercial feed production with the establishment of the feed mill, could not be achieved.

CIFA stated, in June 1997, that in the absence of the equipment, quality control was maintained by procurement of quality ingredients and proper care at the time of preparation of feed. However, the fact remained that the expenditure of Rs.13.98 lakh on import of the equipment had remained unfruitful for the last three years.

ICAR stated, in September 1997, that in spite of the best efforts of CIFA, the equipment could not be installed due to its manufacturing defects.

8.3 Blocking of funds

Inordinate delay in construction of isolation block for infected animals by IVRI, Bangalore resulted in blocking of Rs.40.44 lakh for eight years and in non-achieving the intended objectives.

ICAR approved construction of isolation block at IVRI, Bangalore at a cost of Rs.161.76 lakh and released Rs.40.44 lakh to CPWD in April 1985

Indian Council of Agricultural Research (ICAR), granted administrative approval and expenditure sanction in April 1985 for construction of an isolation block for infected animals, post-mortem theatre and incinerator at Indian Veterinary Research Institute (IVRI), Bangalore. The work was to be executed by the Central Public Works Department (CPWD) at an estimated cost of Rs.161.76 lakh out of which Rs.40.44 lakh were released to CPWD by IVRI in April 1985.

CPWD could not start the work due to lack of expertise

The work on construction of shed could not be started as CPWD had no expertise regarding construction of a highly sophisticated laboratory. The matter was taken up by IVRI with ICAR in December 1989. ICAR suggested IVRI to hand over the work to some other competent agency. Accordingly, agencies like National Building Construction Corporation

and National Dairy Development Board were contacted, which expressed their inability to take up the work due to various reasons. Consequently, CPWD was again contacted for taking up the work. CPWD submitted the revised plan after six years in July 1991 after making changes in the plan for reducing the complexity and size of the shed. ICAR conveyed its administrative approval and expenditure sanction to the revised proposal in November 1993 for Rs.225.32 lakh with scheduled date of completion of work within thirty months. IVRI released Rs.184 lakh between January 1994 and March 1995 in addition to Rs.40.44 lakh released earlier in April 1985. The work had not been completed as of December 1997.

Rs.40.44 lakh released in April 1985 remained blocked for more than eight years

Thus, award of work and release of funds without finalising the drawing and assessing the expertise of the executing agency resulted in blocking of Rs.40.44 lakh for more than eight years (1985-93). The construction of sheds for infected animals with post-mortem hall and incinerator was conceived in May 1977 to conduct the potency testing of the vaccine produced by IVRI. This could not be conducted so far in the absence of this facility.

While admitting the facts in October 1997, ICAR sought to justify the blocking of funds, the cost escalation of the work and the time overrun as an investment for the future. The reply of ICAR was evasive as it did not advance any reason for depositing Rs.40.44 lakh with CPWD in April 1985 which remained un-utilised for more than eight years without examining the feasibility of the execution of the project.

8.4 Unadjusted advances

Advance payments made to the officials, private parties and government departments towards travelling allowance, leave travel concession, supply of stores, construction works etc. amounting to Rs.12.73 crore remained unadjusted till March 1997 of which advances of Rs.11.13 crore were pending recovery/ adjustment for more than two years. This included a sum of Rs.21 lakh lying unadjusted on account of TA/LTC advances.

A test check of 10 out of 89 laboratories/ institutes of Indian Council of Agricultural Research (ICAR) disclosed that advance payments of Rs.12.73 crore made to their own employees, government departments and private parties remained unadjusted as of 31 March 1997 as per details shown below :

(Rupees in lakh)

Sl. No	Name of the laboratory/ Institute	Government departments	Government officials		Private parties	Total
			Contingent advances	TA/ LTC advances		
1	CIFA, Bhubaneswar	-	31.16	15.10	-	46.26
2	CRIJAF, Barrackpore	84.81	2.72	0.45	-	87.98
3	CRRI, Cuttack	304.83	5.77	2.84	-	313.44
4	CARI, Port Blair	14.78	2.19	0.02	-	16.99
5	NRCWS, Jabalpur	66.57	2.87	-	-	69.44
6	ILRI, Ranchi	124.25	2.12	0.31	-	126.68
7	NIRJAFT, Calcutta	160.87	0.89	-	0.99	162.75
8	NEHR, Shillong	-	22.09	2.24	-	24.33
9	WTCER, Bhubaneswar	146.27	4.18	-	-	150.45
10	CICFRI, Barrackpore	274.60	-	0.03	-	274.63
	Total	1,176.98	73.99	20.99	0.99	1,272.95

Out of the amount of Rs.12.73 crore outstanding as of March 1997, Rs.76.46 lakh had remained unadjusted for over 10 years; Rs.374.19 lakh between 5 and 10 years; Rs.593.38 lakh between 2 and 5 years and

Rs.159.48 lakh upto 2 years. NRCWS, Jabalpur did not furnish the year-wise details of outstanding advances of Rs.69.44 lakh. Further, Rs.11.77 crore were advanced by 8 institutes to Government departments for construction works and supply of stores which were awaiting adjustments although most of the construction works had been completed and stores received.

Seven institutes/laboratories which provided TA/LTC advances of Rs.20.99 lakh to the Government officials had neither adjusted the advances nor recovered penal interest in contravention of General Financial Rules. Reasons for non-recovery of penal interest were not intimated to Audit.

The matter was referred to ICAR in October 1997; their reply was awaited as of January 1998.

Chapter 9 : Ministry of Environment and Forests

9.1 Indian Council of Forestry Research and Education, Dehradun

9.1.1 Introduction

The Indian Council of Forestry Research and Education (ICFRE), Dehradun is an autonomous body under the Ministry of Environment and Forests (MOEF). ICFRE was established in June 1991. It has ten research institutes in different parts of the country. Mandate of ICFRE is to advise the Government of India on the formulation of forestry research policy to organise, direct and manage research and education in the forestry sector. Besides, ICFRE is to extend research outputs to the various State Forest Departments, Non Government Organisations (NGO) and the private sector.

9.1.2 Scope of Audit

The present review covers working of ICFRE during the period 1992-97. Out of the ten institutes functioning under ICFRE, five institutes, namely, Forest Research Institute (FRI), Dehradun; Tropical Forest Research Institute (TFRI), Jabalpur; Arid Forest Research Institute (AFRI), Jodhpur; Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore and Institute of Wood Science and Technology (IWST), Bangalore were selected for test check.

9.1.3 Organisational set up

ICFRE is headed by a Director General . The task of broad policy matters and decision making in various specific areas of its activities is performed by the Board of Governors which has 21 members. The Board is headed by the Minister of Environment and Forests, Government of India.

9.1.4 Highlights

- **Funds aggregating Rs.21.25 crore were diverted during 1992-97 from externally aided projects to normal budget of ICFRE .**

  (Para 9.1.5)

- **No records relating to research projects and development of technology were maintained.**

  (Para 9.1.6)

- **Equipment costing Rs.8.41 crore procured during the years 1993-96 under externally aided projects could not be installed rendering the expenditure unfruitful.**

  Import of 126 equipment on CIF basis instead of FOB basis resulted in outflow of foreign exchange equivalent to Rs.55.51 lakh.

  Non-investment of letters of credit amount resulted in loss of interest of Rs.21.20 lakh.

  (Para 9.1.7)

- **Grants of Rs.5.46 crore were released to the Agricultural Universities without insisting for utilisation certificates.**

  (Para 9.1.8)

- **Publications of research material in bulk, without assessing the actual requirement, resulted in publications worth Rs.29.69 lakh remaining unsold.**

  (Para 9.1.9)

9.1.5 Manpower and Budget

(a) Manpower

As on 31 March 1997, ICFRE had 362 scientists, 665 technical personnel and 427 administrative personnel against sanctioned strength of 509, 1029

and 599 respectively. The ratio of scientific, technical and administrative personnel was 1:2:1. No norms had been fixed to govern the ratio of scientific personnel and non-scientific staff. The reasons for the large number of vacancies, especially in the cadre of scientists, and how the same affected the working of ICFRE were not furnished to Audit.

(b) Budget and financial performance

(i) ICFRE was financed mainly by the MOEF. Grants received during 1992-97 from MOEF and expenditure incurred therefrom were as under:

(Rupees in crore)

Head	1992-93		1993-94		1994-95		1995-96		1996-97	
	Grants Released by MOEF	Expen-diture	Grants Released by MOEF	Expen-diture	Grants Released by MOEF	Expen-diture	Grants Released by MOEF	Expen-diture	Grants Released by MOEF	Expen-diture
General Component										
Plan	20.00	20.98	20.50	24.20	20.00	23.73	14.05	25.25	20.75	20.62
Non-Plan	7.02	7.00	6.62	7.04	6.62	7.05	6.75	7.21	6.88	7.36
Forest Education										
Plan	0.90	0.90	1.04	1.04	1.05	1.05	1.05	1.05	0.46	0.46
Non-Plan	--	--	0.42	--	0.44	--	0.46	--	0.48	--
Externally Aided Project										
Plan	--	--	7.50	0.37	20.00	16.46	27.05	18.11	25.45	21.42
Non - Plan	--	--	--	--	--	--	--	--	--	--
Total	27.92	28.88	36.08	32.65	48.11	48.29	49.36	51.62	54.02	49.86

(ii) ICFRE generates revenue through sale of books, nursery plants, testing fee and consultancy services etc. The total revenue realised during the period 1992-97 amounted to Rs.4.83 crore.

(iii) ICFRE also receives funds from foreign agencies for specific projects. It received a total sum of Rs.84.58 crore on this account during the five year period 1992-97, of which Rs.60.45 crore could be utilised; Rs.21.25 crore were diverted to normal budget in 1992-93, 1994-95 and 1995-96 to meet excess expenditure against their normal budget. Of Rs.21.25 crore, Rs.16.94 crore were diverted during 1993-97 from Forestry Research Education and Extension Project (FREEP) without approval of MOEF. ICFRE stated that funds from externally aided projects

Diversion of funds amounting to Rs.21.25 crore from EAP to normal plan funds

(EAP) earmarked for this project had to be diverted during 1993-97 for meeting the normal expenditure of ICFRE in the absence of sufficient budgetary support from MOEF.

9.1.6 Research activities

Records relating to in-house research projects and development of technology were not maintained

ICFRE conducts research through various in-house projects and externally aided projects. It was observed in Audit that information relating to number of research projects undertaken, dropped or completed in various institutes was not available with ICFRE. As most research activities aimed at transfer of technology, ICFRE was required to extend research outputs to various State Forest Departments, NGOs and the private sector. ICFRE had not maintained any records of the years in which technologies were developed and transferred to the beneficiaries. It was stated by ICFRE that after initiation of World Bank project in September 1994, it had identified 32 tested technologies for extension. Out of these 32 technologies, depending upon the available staff and demonstration capacity, only 17 technologies were being taken up to the field for extension and were yet to be extended.

The Ministry while accepting the facts stated, in December 1997, that preparation of projects data base at ICFRE headquarters was under process and would be completed by March 1998.

9.1.7 Material management

(a) Unfruitful procurement

Due to improper planning equipment worth Rs.7.94 crore could not be installed

Under FREEP, equipment amounting to Rs.7.94 crore were procured from abroad by ICFRE during 1995-96. These equipment could not be installed/commissioned as some of the equipment were damaged during transit while some were returned to ICFRE by the respective institutes, owing to non-availability of space for installation and non-availability of requisite power supply. This was as a result of unplanned and unnecessary procurement of equipment. The expenditure of Rs.7.94 crore was unfruitful.

The Ministry stated, in December 1997, that the uninstalled equipment were in the process of installation.

(b) Defective purchase under UNDP

Non-utilisation of equipment worth Rs.38.58 lakh resulted in blocking of funds

One X-ray seed scanner for TFRI, Jabalpur was procured under United Nations Development Programme (UNDP) Project at a cost of Rs.21.31 lakh (US $ 67,535) during 1995-96. Though the equipment was installed and commissioned during May 1995, TFRI, Jabalpur did not accept the equipment due to the reason that the shelf, on which the X-ray generation unit was to be housed, was found broken. The equipment was sent back to the firm during February 1996 for repair/replacement and was yet to be received back.

Similarly, one Universal Timber testing machine for Institute of Wood Science and Technology, Bangalore costing Rs.17.27 lakh (US $ 54,728) procured under the project during 1995-96 could not be commissioned due to malfunctioning. The matter was taken up with the supplier and its local agent for getting the equipment repaired. It was finally agreed to ship back the equipment for replacement, which had not been done till December 1997.

Thus, the equipment could not be used since their procurement rendering the expenditure of Rs.38.58 lakh unfruitful.

(c) Unused equipment

Equipment worth Rs.8.17 lakh were not utilised since procurement

Test check of records of IFGTB, Coimbatore revealed that equipment, valued at Rs.8.17 lakh were not installed since January 1994 after their procurement for want of special power supply of three phase line with 22 Amps, which was to be provided by Central Public Works Department (CPWD). The warranty/guarantee period of the equipment had already expired. Non-installation of these equipment had also affected the implementation of projects.

The Ministry stated, in December 1997, that installation of the equipment would be done after obtaining required power supply. As such Rs.8.17

lakh incurred on this equipment remained unfruitful for more than three years.

(d) Non-maintenance of log books of costly equipment.

Non-maintenance of log books of costly equipment

Log books of costly equipment are required to be maintained to ensure their proper working/utilisation. However, test-check of records revealed that in FRI, Dehradun log books were not maintained in respect of 12 major and costly equipment amounting to Rs.1.86 crore.

The Ministry accepted the fact in December 1997 and assured future maintenance of log books of all equipment in all institutes of ICFRE.

(e) Outflow of foreign exchange

Avoidable payment of foreign exchange equivalent to Rs.55.51 lakh

As per General Financial Rules (GFRs), all import of stores should be made on free on board (FOB) basis, instead of cost, insurance and freight (CIF) basis, to avoid the unnecessary outflow of foreign exchange. A perusal of the files relating to opening of letters of credits (LC) in respect of foreign purchases under World Bank project and other projects during 1994-95 and 1995-96 revealed that ICFRE and its three institutes had placed 126 purchase orders in favour of foreign suppliers for supply of scientific equipment on CIF basis instead of FOB basis, which resulted in avoidable payment in foreign exchange equivalent to Rs.55.51 lakh on account of insurance and freight (Rs.42.87 lakh by ICFRE (Headquarters), Rs.6.70 lakh by IFGTB Coimbatore, Rs.3.45 lakh by AFRI, Jodhpur and Rs.2.49 lakh by TFRI, Jabalpur), which could have been paid in Indian rupees.

The Ministry stated, in December 1997, that ICFRE was not equipped to arrange transportation of equipment from various countries after placing orders on FOB basis. Further, this amount of foreign exchange would have been spent in transporting the items from various countries after ordering on FOB basis. The contention of MOEF was not correct, as the transportation work could have been assigned to Indian firms and payment made in Indian currency thereby preventing avoidable outflow of foreign exchange of Rs.55.51 lakh.

(f) Loss of interest due to non-investment of amount of letters of credit (LC)

Non-investment of letter of credit amount resulted in loss of interest of Rs.21.20 lakh

ICFRE had procured about 89 foreign equipment between 1994 and 1997 under World Bank project after opening of LCs. It was observed that it was regularly opening LC upto a crore of rupees without keeping it under short term deposits. The period between opening of LC and negotiation ranged from 46 days to one year. Had the margin money been kept in the short term deposit, as per Government of India's instructions, ICFRE could have earned interest of Rs.21.20 lakh (Rs.20.31 lakh by ICFRE (Headquarters) and Rs.0.89 lakh by TFRI, Jodhpur) at the rate of 8 *per cent* per annum.

The Ministry accepted the fact and assured, in December 1997, that amounts deposited with banks for LCs would be kept in short term deposits.

(g) Avoidable extra expenditure on purchase of vehicles

Extra expenditure of Rs..28.33 lakh was incurred on purchase of expensive vehicles

As per staff car rules, Government Organisations are permitted to purchase Ambassador, Fiat and Maruti Cars including vans and Gypsies for use as staff cars. Test check of records revealed that ICFRE had purchased 12 expensive cars like Contessa etc. amounting to Rs.49.39 lakh from their normal budget/World Bank Project Fund. This resulted in an avoidable expenditure of Rs.28.33 lakh, calculated on the basis of the then prevailing price of the approved vehicles.

(h) Non-recovery of liquidated damages

Liquidated damages of Rs.7.08 lakh were not recovered

ICFRE placed a purchase order for 'Plant Growth Chamber', at a cost of Rs.70.77 lakh, on M/s Sanyo Gallan Kamp, United Kingdom in December 1993. The equipment was received in November 1995 against the scheduled date of delivery in September 1994. As per the terms and conditions of the purchase order, 10 *per cent* of the cost of equipment was to be levied as liquidated damages for delay in supply of more than six months. However, ICFRE failed to invoke the contractual penal provision and an amount of Rs.7.08 lakh remained un-recovered.

The Ministry stated, in December 1997, that as per Audit observations, ICFRE had instructed the Drawing and Disbursing Officer (DDO) to recover the liquidated damages.

9.1.8 Accounts

(a) Improper arrangements for preparation of accounts

In spite of having accounts wing, accounts were prepared and audited by the same Chartered Accountant

In spite of having a separate accounts wing, the annual accounts for the year 1996-97 were prepared by M/s A.K. Kashyap & Company, Chartered Accountants, hired by ICFRE for auditing their accounts. Rs.32,000 were charged by the firm as their fee during 1996-97 which included a sum of Rs.22,000 for accounting function. By entrusting the work of preparation of accounts and auditing of the accounts so prepared to the same firm of Chartered Accountants, ICFRE had shown gross irregularity.

(b) Outstanding utilisation certificates

ICFRE releases grants-in-aid to different Agricultural Universities subject to submission of utilisation certificates (UC). Though releases were made regularly every year, ICFRE did not insist for submission of UCs before the release of subsequent grants.

Utilisation certificates worth Rs.5.46 crore were outstanding from Agricultural Universities, of which UCs worth Rs.3.44 crore were outstanding for more than three years

A test check of records revealed that as on March 1997, 14 UCs, for grants aggregating Rs.5.46 crore, were outstanding. Of these, UCs in seven cases, aggregating Rs.3.44 crore, were outstanding for more than three years. ICFRE also had shown little concern for ascertaining whether the universities had utilised the funds for intended objectives. While sanctioning grants, provision for submission of audited statements of expenditure, as required in the GFRs, was not included in the sanctions. In the absence of such certificate, the authenticity of the expenditure could not be ensured.

The Ministry stated, in December 1997, that no further grants would be released by ICFRE to any University till receipt of UC for the amount already released.

9.1.9 Other points of interest

(a) Non-generation of adequate revenue receipts

As per the decision taken by the Board of Governors, ICFRE had to create a 'Pension Fund' for meeting the pension liability with effect from 1992-93. For this, it was resolved that annual receipts of ICFRE, such as from sale of books, tender forms and nursery plants, testing fees, training fees and fees on account of consultancy rendered by ICFRE etc., amounting to rupees two to three crore would be deposited as pension fund initially, along with matching grants from ICFRE budget, to build up the required corpus of Rs.30 crore over a period of five to six years.

The revenue receipts during 1992-97, were only Rs.4.83 crore and due to low generation of revenue receipts, revenue transferred to Pension Fund, including matching grants was Rs.9.75 crore. Thus, it may not be possible for ICFRE to achieve its target of Rs.30 crore by the end of this decade.

The Ministry stated, in December 1997, that a committee had been constituted at ICFRE to explore the possibility of generating revenue receipts.

(b) Non-recovery of water/electricity charges from Tamil Nadu Forest Department

Recovery of water and electricity charges of Rs.12.01 lakh from TNFD was not made

As per the Memorandum of Understanding between IFGTB, Coimbatore and Tamil Nadu Forest Department (TNFD) in October 1989, the entire payment for electricity, water, maintenance of roads and management of the campus was to be borne by the institute, at the first instance, followed by its recovery @ of 10 *per cent* of the total expenditure from the TNFD for their office and residential quarters situated in IFGTB campus.

An amount of Rs.1.20 crore was incurred by IFGTB, Coimbatore during 1990-97 on electricity, water and maintenance of roads etc. Perusal of records by Audit indicated that no action has been initiated to recover the amount of Rs.12.01 lakh at the rate of 10 *per cent* of total expenditure from TNFD.

The Ministry stated, in December 1997, that matter had been taken up with TNFD for recovery of the amount.

(c) Library

No physical verification of library conducted since inception

ICFRE library has books and periodicals valuing Rs.4.12 crore. However, no physical verification had been done of their library since inception. The correctness of the stock could not, therefore, be ascertained in Audit. The five institutes selected in Audit had also failed to conduct physical verification of books in their libraries since their inception.

The Ministry accepted the facts and stated, in December 1997, that the physical verification was under process.

(d) Overstocking of publications

Unsold publications worth Rs.29.69 lakh remained in stock

During 1991-97, publications worth Rs.36.07 lakh were got printed. Out of this, unsold printed publications valuing Rs.29.69 lakh were lying in the stock as of July 1997. This included printed material worth Rs.7.31 lakh. printed six years ago in 1991.

The Ministry admitted the fact and stated, in December 1997, that being first edition, it was difficult to project the demand of these books precisely by ICFRE and efforts were being intensified for their sale.

Chapter 10 : Ministry of Non-Conventional Energy Sources

10.1 Solar Energy Centre, Gurgaon

10.1.1 Introduction

Solar Energy Centre (SEC), a technical wing of the Ministry of Non-Conventional Energy Sources (MNES) was started as a project with UNDP assistance during 1982. It was intended to provide linkage between Government, industry and research institutes at national as well as international level for developing and promoting technologies involving harnessing and use of solar energy in India. The main objectives of SEC are to undertake design, testing, standardisation, product development, system engineering and consultancy, resource assessment and training activities relating to both solar thermal and solar photo voltaic (PV) technologies.

10.1.2 Scope of Audit

This review examines the activities of SEC on research, development and extension of technology of harnessing solar energy during 1992-97, with a view to evaluate whether SEC had been able to achieve its objectives.

10.1.3 Organisational set up

SEC, headed by a Director, is organised into six divisions/groups, each entrusted with a specific area of activity. These are :

(i) Solar Thermal division for testing of solar cookers and flat plate collectors meant for trapping solar thermal energy ;

(ii) Solar Photo Voltaic division for testing of PV cells, PV modules, domestic lighting system, street lighting system, solar lanterns, water pumps etc. ;

(iii) Power Generation division for solar power generation through thermal route ;

(iv) Information and Dissemination group for looking after the research needs and utilisation thereof ;

(v) Product Development and Resource Assessment group to assess the demand and resources; and

(vi) International Co-operation group for co-ordinating and co-operation among the Group-15 developing countries in the field of solar energy applications.

10.1.4 Highlights

- **The requirement of funds for SEC was not projected realistically. As a result, SEC had to surrender more than one-third of the allocated funds during 1992-97. Percentage of savings ranged from five to 59.**

  (Para 10.1.5)

- **No feasibility study was conducted before creation of photo voltaic and solar testing facilities. These facilities were under-utilised during the last five years as very few samples were being received from the industry for testing. SEC's objective of providing support to industry for quality control and product improvement could not be achieved.**

  Equipment worth Rs.89 lakh earmarked for material testing were installed after a delay of 22 to 57 months. No material testing had been done as of December 1997 rendering the expenditure unfruitful.

  (Para 10.1.6)

- **A Solar Thermal Power Plant of 50 KW capacity installed in a village for demonstrating feasibility of generation of electricity at a cost of Rs.2.19 crore remained inoperative for more than five years from November 1990 to February 1996. Though recommended for dismantling in October 1994, the plant was finally made operational at downgraded capacity of 15-20 KW in February 1996 with modified objective of conducting R&D, which could also not be achieved. The expenditure of Rs.2.43 crore, including Rs.23.83 lakh on its repair, maintenance and staff proved unproductive.**

  (Para 10.1.7)

- **Under an Indo-German project, having German assistance of DM 2.3 million, non-achievement of objectives resulted in deferment of assistance by the foreign collaborator for the second phase .**

{Para 10.1.9(a)}

- **Under a USAID assisted project, SEC incurred avoidable expenditure of Rs.14.52 lakh during January 1992 to June 1993 towards payment of Customs duty and demurrage. No staff was deployed as of August 1997 on the project costing Rs.2.80 crore.**

{Para 10.1.9(b)}

- **Equipment valued at Rs.12.24 lakh procured during 1988-93 under UNDP project were lying idle in store as of August 1997. 18 out of 24 scientific staff trained abroad specifically to operate the imported equipment meant for the project were transferred from SEC to MNES. In spite of continuance of the project for more than two years beyond its schedule, SEC failed to implement the action plan recommended by a mission comprising of foreign and Indian representatives.**

{Para 10.1.9(c)}

- **Equipment/stores valued at Rs.19.81 lakh were lying idle in store for periods ranging from five to ten years.**

Guest house constructed in 1991 at a cost of Rs.18.47 lakh remained unoccupied for five years.

(Para 10.1.10)

10.1.5 Manpower and financial outlay

(a) Manpower

There had been persistent shortage of manpower in SEC, since 1992, particularly in scientific and technical cadres. As on 31 March 1997, against the sanctioned strength of 16 scientific, 29 technical, 7

Scientific vacant posts remained unfilled by MNES

administrative and 42 other posts, men in position were 11, 21, 7 and 32 respectively. MNES was the cadre controlling authority in respect of scientific posts. It was observed that vacancies arising from transfer of officers from SEC to MNES were not being filled up.

Accepting the facts, the Ministry stated in December 1997, that three senior scientific officers had since been posted to augment the scientific cadre of SEC.

(b) Financial outlay

Funds for SEC were included in the Demands for Grant of MNES. It also received assistance in kind from various foreign collaborators. The details of funds received and actual expenditure incurred during 1992-97 were as under:

(Rs.in lakh)

Year	Budget	Expenditure	Amount surrendered
1992-93	121	91.12	29.88
1993-94	210	90.51	119.49
1994-95	213	203.02	9.98
1995-96	213	193.29	19.71
1996-97	300	122.82	177.18
Total	1057	700.76	356.24

Requirement of funds was not projected realistically

It was evident from the above that the requirement of funds for SEC was not projected realistically. As a result, more than one-third of the allocated funds during 1992-97 had to be surrendered. The year-wise details of savings under each head were as under :

(Rs.in lakh)

Year	Heads of account								
	Salaries			Machinery and equipment			Demonstration*		
	Budget	Expenditure	Savings	Budget	Expenditure	Savings	Budget	Expenditure	Savings
1992-93	35.60	30.19	5.41	10.00	3.73	6.27	2.00	--	2.00
1993-94	42.00	31.43	10.57	--	--	--	34.00	7.20	26.80
1994-95	48.00	33.81	14.19	--	---	---	---	---	---
1995-96	48.00	40.24	7.76	150.00	14.95	135.05	--	--	--
1996-97	53.00	48.03	4.97	75.00	17.15	57.85			

* Head 'Demonstration' merged with 'Machinery and equipment' w.e.f. 1.4.1996

Savings under the head 'Salaries' were due to the fact that budget proposals were prepared by SEC for the sanctioned strength instead of the actual staff. Consequently, funds provided for the vacant posts were surrendered. Under the head 'Machinery and equipment', savings were due to failure to make timely assessment of the need for additional items of equipment intended to be financed from the available foreign assistance.

While accepting the facts the Ministry stated, in December 1997, that the time taken for interacting with other R&D institutions for project formulations also contributed to non-utilisation of the funds.

10.1.6 Testing and standardisation

Due to non-conducting of feasibility study both Solar Thermal and PV testing facilities remained under-utilised

As per objectives of SEC, it was to act as the nodal and referral test centre for co-ordinating solar thermal and photo voltaic testing activities within the country and develop and update standards on the basis of feedback. In pursuance of this objective, SEC established Solar Thermal and photo voltaic testing facilities during 1992-97. It was observed in Audit that no feasibility study to assess the number of samples likely to be received and tested was conducted before the creation of facilities. MNES also did not make it mandatory for all manufacturers to get their products tested and certified by SEC while giving subsidy. Consequently, the number of samples received by these facilities for testing was very low. Thus, SEC could not achieve its stated objective of providing technical support to industry for quality control and product improvement.

A review of performance of SEC in respect of these facilities revealed the following :

(a) Solar thermal testing facility

The solar thermal testing facility was established at Gurgaon during 1992-93. The standards laid down by the Bureau of Indian Standard were followed for testing.

Out of 51, only 13 manufacturers approached SEC for testing of 62 samples during last five years

It was observed that of the 51 manufacturers of solar thermal systems in the market, SEC received 16 samples of solar cookers and 46 samples of solar collectors from 13 manufacturers during 1992-97. As such, SEC tested on an average three samples of solar cookers and nine samples of

solar collectors each year which indicated sub-optimal utilisation of the testing facility.

While accepting the fact of under-utilisation of the testing facility, SEC stated in August 1997, that the subsidy given to the manufacturers on solar flat plate collectors and solar cookers was withdrawn since 1993 and 1994 respectively by MNES, which resulted in loss of interest on the part of manufacturers to make products run on solar energy.

The Ministry, in its reply of December 1997, stated that initiatives were being undertaken to enhance the utilisation of the facility.

(b) Solar photo voltaic testing facility

Out of 74 manufacturers of PV systems, only 22 approached SEC for testing

In December 1994, a photo voltaic testing facility was established at SEC. Of the 74 manufacturers of PV systems in the field as in March 1997, only 22 approached SEC for testing. The details of samples received and tested during 1994-97 were as under:

Product	No. of samples tested during year			
	1994-95	1995-96	1996-97	Total
Solar cells	24	50	--	74
PV modules	100	300	218	618
Domestic lighting system	08	04	06	18
Street lighting system	01	03	07	11
Solar lanterns	50	210	101	361
PV water pumping	--	01	02	03
Total	183	568	334	1085

As is evident from the above table, apart from PV modules and solar lanterns, the number of samples tested in case of all other products was marginal. The fact of under-utilisation of the facility was accepted by SEC in August 1997. In this connection, SEC stated that as per MNES programme, testing was mandatory only for solar lanterns and PV modules. For other systems, the testing was at the option of the manufacturers/users.

The Ministry stated, in December 1997, that SEC was assisting in the preparation of technical specifications and standards and a number of

samples and systems had been tested during the period covered in this review. However, the Ministry conceded that the utility of the facility depended on the policy of the Government. Since testing of systems was not mandatory, this affected the utilisation of the facility.

Establishment of new centres for testing PV samples at a cost of Rs.1.05 crore was unjustified

In addition to testing facility at Gwalpahri (Gurgaon), MNES had sanctioned Rs.1.12 crore and released Rs.1.05 crore upto March 1997 to SEC for establishment of three additional photo voltaic testing centres at Bangalore, Calcutta and Thiruvananthapuram as most of the PV component/ system manufacturers were stationed in southern States. Principal Scientific Officer of SEC conducted an inspection in July 1997 of the three centres. As per report submitted by him, the test centres, set up in 1996-97, were not utilised to their full capacity. The main reason for under-utilisation of the facility was attributed to lack of awareness on the part of the manufacturers. Evidently, the creation of three additional centres was not preceded by an assessment by MNES of the likely demand for the services sought to be provided by SEC to the manufacturers. Moreover, SEC failed to create an awareness among manufacturers for getting their products tested at these centres. This rendered the expenditure of Rs.1.05 crore incurred on setting up of these centres largely unfruitful.

The Ministry's reply (December 1997) that the activity in these three centres had picked up in 1997-98, could not be verified as it had failed to support its contention with the figures of tests actually conducted by the centres.

(c) Material research and testing

SEC failed to achieve the specified objectives by not conducting material testing; equipment worth Rs.89 lakh earmarked for the purpose remained idle

To improve the durability and reliability of solar energy devices, increase their efficiency and reduce their cost, SEC earmarked equipment worth Rs.89 lakh in 1989-90 for material testing, a part of solar thermal system testing. However, due to delay in establishing thermal testing facility, the installation of these equipment was delayed for periods ranging from 22 to 57 months. It was observed that, as of August 1997, no material testing had been done, leading to non-standardization of solar devices from the

view point of their reliability and durability. Thus, the expenditure of Rs.89 lakh had not been fruitful.

The Ministry admitted, in December 1997, the fact of delay in setting up the facility and attributed the same to inadequacy of the scientific personnel.

10.1.7 Solar thermal power generation

MNES decided in 1984 to set up a power plant at Achheja village in Uttar Pradesh by utilising solar energy through line focusing collectors for generation of 50 KW electrical power. The main objective of the project was to demonstrate the feasibility of generating electric power from solar energy on a small scale in villages. In February 1988, with the construction of SEC at Gwalpahri, MNES decided to install the plant at SEC campus so as to utilise the energy produced by the plant in their workshop. The plant was commissioned in April 1989 at a total cost of Rs.2.19 crore.

During its operation several problems cropped up with the reflectors and receiver tubes and finally, the plant was shutdown in November 1990. The Advisor and Head of SEC recommended dismantling of the plant in October 1994 in view of the estimated heavy expenditure of Rs.3 to 4 crore for renovation/rebuilding of reflectors and receiver tubes. The solar thermal group, however, was of the view that the plant might serve as demonstration unit for providing training and technical support for 30 MW power plant proposed to be set up at Jodhpur in Rajasthan by MNES and other similar plants likely to come up in future. The plant was thus made operational in February 1996 at a downgraded capacity of 10-15 KW .

Even after spending Rs.2.43 crore on installation and maintenance of 50 KW solar thermal power plant, it remained inoperative for more than five years, resulting in unproductive expenditure

It was observed in Audit that SEC incurred a total expenditure of Rs.23.83 lakh (Rs.10 lakh each, on salary and maintenance during the shutdown period, Rs.0.55 lakh on underground cables for connecting the plant with workshop and Rs.3.28 lakh on the revival of the plant) till March 1997. However, the plant could generate only 1520 KWH (units) by running for

72 days from May 1989 to March 1997. The proposed 30 MW thermal power plant at Jodhpur was also not set up.

Thus, the power plant set up at a cost of Rs.2.19 crore remained inoperative for more than five years and even after incurring an additional expenditure of Rs.23.83 lakh, its objectives were not achieved. SEC stated that the installation of 50 KW solar thermal power plant was initiated as a research and development project on solar power generation and while formulating the project, it was envisaged that power produced by the plant would be used in the workshop. The reply was not tenable as the initial objective of the project was to serve as a small scale decentralised power generation plant. It was only at the time of revival of the plant that it was conceived as R&D project. Even the contention of SEC that the plant was mainly used as demonstration project for students and researchers in the area of solar power generation was not supported with relevant figures or documents confirming technology demonstration.

The Ministry stated, in December 1997, that non-availability of some of the broken components in the international market led to the present state of the plant.

Thus, the purpose of setting up of the plant was defeated, rendering the total expenditure of Rs.2.43 crore upto March 1997 unproductive.

10.1.8 Workshop

A workshop for fabrication and maintenance of mechanical items required to support development and testing works of various divisions of SEC was functioning at SEC since 1982. The workshop was equipped with machinery and equipment valued at Rs.14.55 lakh procured between 1983-90 under UNDP assistance.

Workshop was under-utilised for want of sufficient work

In the workshop, the fabrication works were mainly supposed to be received from both solar thermal and photo voltaic testing facilities. As both the facilities were under-utilised for want of sufficient samples, they could not award work to the workshop regularly. Scrutiny of job cards and job registers maintained by SEC revealed that during 1992-97 the workshop had received only 151 jobs, of which 119 jobs were of repairs

and maintenance, petty works etc. and 32 of fabrication. It was further observed that during 1993-96, staff had worked for only one to two months in a year and had remained idle for rest of the period. Between 1992-96, 22 officials including one foreman were deployed and, at the instance of Audit, the strength was reduced to 14 with effect from 1996-97. In August 1997, SEC accepted that workshop has been under-utilised for want of sufficient work-load.

The Ministry accepted the facts in December 1997.

10.1.9 Foreign collaboration projects

In pursuance of its objectives, SEC implemented following projects in collaboration with foreign agencies. The details of such projects and audit observations thereon are as under:

(a) Indo-German collaboration project

To set up indoor-outdoor test facilities for uninterrupted testing of solar devices, a project was conceived under Indo-German Technical Co-operation Programme in September 1990 for a duration of four years. The German assistance was DM 2.3 million for equipment and training and that of Government of India, Rs.20 lakh for building and other infrastructure.

The project commenced in September 1990 and was extended upto March 1995. However, some of the objectives of the project such as research and development activities, uniform standards for solar thermal system and know-how transfer of solar thermal systems/components to Indian industries etc. were not achieved.

Non-achievement of the objectives resulted in second phase being planned, which has also not materialised till date

To achieve the remaining objectives mainly standardisation of Solar Thermal System and transfer of know-how to industry, a second phase of two years was agreed to by the two sides. While planning for the second phase, the German team, in a workshop held in May 1994, expressed their concern over the lack of linkage between SEC and industry and non-availability of personnel for the project. The issue of granting autonomous status to SEC was also raised. The German team stated that they would be able to extend assistance for the second phase only after resolving these

issues. However, SEC did not take any initiative for strengthening its interface with industry. As regards the issue of granting autonomous status to SEC, the matter was stated to be under consideration of MNES since February 1996. No decision had been taken as of November 1997.

Test check of SEC's records disclosed the following:

Solar thermal system testing facility could not be installed as of December 1997

(i) SEC succeeded only in setting up solar collector testing facility, whereas system testing facility had not been established as of December 1997 due to second phase not having taken off.

Scientific staff of SEC were transferred to MNES immediately on their return from abroad after training

(ii) SEC sent four scientific staff abroad for training on installation, operation and maintenance of the facilities which would be installed at SEC. The trained officers were to work as core group of scientists for equipment operation and maintenance. It was observed that out of four trained scientific staff, three were transferred to MNES immediately on their return from training.

(iii) Even after a period of more than three years of the workshop held in May 1994, no feed back was obtained by SEC from any industry/user for expert advice on updating the production techniques to bring it to the international level.

(b) USAID project

A project for creation of PV testing facility, hardware procurement, training programmes and field evaluation was initiated by SEC in February 1991, for a duration of three years, in collaboration with United States Agency for International Development (USAID). The share of USAID was $ 549000, equivalent to Rs.1.42 crore, for equipment and training and the Government of India was to contribute Rs.1.38 crore for civil construction, provision of staff, equipment etc.

Scrutiny of records revealed the following lapses :

SEC incurred an avoidable extra expenditure of Rs.14.52 lakh towards payment of Customs duty and demurrage

(i) Scientific/technical equipment not manufactured in India and imported for research activities were not subject to payment of Customs duty, provided that 'not manufactured in India' and Customs duty exemption certificate were obtained from the Directorate General Trade Development before Customs clearance of the imported goods. SEC failed to obtain such certificate while clearing the equipment received under this project and paid Rs.12.03 lakh towards Customs duty during January 1992 to June 1993. In addition, SEC had also incurred an expenditure of Rs. 2.49 lakh towards payment of demurrage due to delay ranging from two to eleven months in clearance of the consignments. The reason for delay was stated to be change in the name, description and cost of equipment from the list provided earlier by USAID authorities. No responsibility was fixed by SEC for incurring the avoidable payment of Rs.14.52 lakh.

No staff was deployed on the project

(ii) As per project proposal, 21 personnel under different categories for test facility were to be deployed but no deployment of staff was made against the posts till August 1997. SEC accepted that research, development, testing and evaluation work had been hampered due to lack of trained manpower. The Ministry accepted the facts in December 1997.

(c) UNDP project

In order to establish a facility for updating existing technology, prototype development and fabrication, system engineering, demonstration and field testing in solar thermal energy, a project titled "Solar Thermal Energy Centre" was initiated by MNES in 1981 in collaboration with United Nations Development Programme (UNDP). The project was planned in two phases.

The first phase commenced in 1984 with UNDP assistance of $ 3.72 million, in the form of specialised material/equipment and training for SEC's scientific staff abroad. The Government of India was to contribute Rs.3.25 crore towards salaries, land, building etc. The main objectives of the first phase were setting up of Solar Thermal Energy Centre, procurement and installation of equipment and training.

Scrutiny of records relating to the first phase revealed as under :

Transfer of trained manpower to MNES rendered the training unfruitful

(i) SEC sent 24 scientific staff abroad for training. Out of the trained staff, 18 were transferred to MNES. Transfer of trained staff rendered the training unfruitful as training was specifically meant to equip the personnel in operation of imported equipment.

Equipment worth Rs.12.24 lakh procured during 1988 to 1993 were lying unutilised

(ii) Though the first phase of the project commenced in 1984, no equipment was received during the first phase (1984-88), due to delay in ordering the equipment by SEC and delay in completion of SEC's building. The same were received during 1988 to 1993. A test check of store records revealed that out of these, some sophisticated equipment/spare parts etc. valuing about Rs.12.24 lakh were lying in the stores as of November 1997. The Ministry stated in December 1997 that non-utilisation of equipment and stores was due to transfer of trained personnel from SEC to the Ministry.

The second phase commenced in March 1988 with UNDP assistance of $ 1.51 million on material/ equipment and Government of India's contribution of Rs.3.18 crore for infrastructure facilities. The main objectives of the second phase were (i) commissioning of facilities, (ii) preparation of testing standards for thermal devices, (iii) technology transfer etc. The project continued two years beyond its schedule till December 1993.

Follow up action plan was not initiated as recommended by the evaluation team

During July 1993, a mission comprising of foreign and Indian representatives evaluated the project and pointed out that there was delay in project implementation due to unrealistic time plan. It also pointed out delay on the part of SEC in ordering, installing and commissioning of the equipment. SEC was found to be understaffed in terms of technicians. The mission recommended a limited UNDP supported three year follow up action plan. SEC, however failed to take any follow up action.

10.1.10 Other points of interest

(a) Non-issue of stores

A review of various stock registers maintained by SEC's central store revealed that 90 items like machinery, equipment, tools, chemicals etc., costing Rs.19.81 lakh, had not been issued since their procurement during the last five to 10 years. In the absence of issue, it could be inferred that there was no justification for procurement of these materials. Ministry stated, in December 1997, that some items of stores like tools and measuring instruments were given on loan basis to workshop as and when required.

Equipment/stores worth Rs.19.81 lakh had not been issued for the last five to ten years

(b) Unfruitful expenditure on construction of Guest House

A guest house comprising six suites for trainees and visitors was constructed at SEC, Gwalpahri (Gurgaon) at a cost of Rs.18.47 lakh in 1991. However, it remained unoccupied for five years and was made operational only from March 1996. SEC stated that visitors and trainees did not prefer to stay at the guest house because of its remote location and lack of other related facilities, such as public transport, reliable telecommunication network, non-availability of market or hospital facility in the vicinity.

Guest house constructed at a cost of Rs.18.47 lakh remained unoccupied for five years

The aforesaid problems were foreseeable. The expenditure of Rs.18.47 lakh did not serve the intended purpose.

(c) Non-accountal of equipment/spares in central stores worth Rs.1.06 crore

Equipment/spares procured under USAID project and Indo-German project worth Rs.1.06 crore were not taken into central stores account in violation of GFRs. This indicated ineffective inventory control.

Equipment/spares worth Rs. 1.06 crore were kept out of central stores records

Accepting the facts, the Ministry stated, in December 1997, that the work of preparation of inventory was delayed due to non-availability of the services of Stores Officer for two years due to his suspension. It was further stated that this work had since been initiated by SEC.

(d) ***Review report of MNES***

MNES constituted a committee consisting of Advisor to Department of Atomic Energy, Director, NPL and Director, IIT, Delhi in August 1996 to review the functioning of SEC. The report, submitted in the same month, attributed SEC's improper functioning to lack of expertise, inadequate staffing, erratic power supply to the Centre and the policy of interchangeability of scientific personnel between SEC and MNES. Although the Committee was set up by MNES, no follow up action had been taken by MNES on the observations of the Committee by the Ministry as of November 1997.

The Ministry stated, in December 1997, that the matter had been considered by the 'Commission for Additional Sources of Energy' a policy making body of the Ministry, and a final decision in this matter would be taken in the near future.

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Principal Director of Audit
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New Delhi
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- 8 MAY 1998

Countersigned

(V.K. SHUNGLU)
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- 8 MAY 1998

Appendix I

Grants paid to Autonomous Bodies

(Reference - Paragraph 1.1.7 at page 7)

(Rs.in crore)

Sl. No.	Ministry/Department Name of the Autonomous Body	Amount of grants received in 1996-97
	Department of Atomic Energy	
1.	Tata Memorial Centre, Mumbai	33.87
2.	Saha Institute of Nuclear Physics, Calcutta	9.98
3.	Institute of Physics, Bhubaneswar	6.06
4.	Atomic Energy Education Society's School, Mumbai	3.28
5.	Tata Institute of Fundamental Research, Mumbai	54.50
6.	Mehta Institute of Mathematical Physics, Allahabad	2.62
	Total	110.31
	Department of Electronics	
7	Centre for Development of Advance Computing, Pune	11.07
8	Society for Applied Microwave Electronics Engineering Research, Mumbai	7.19
9	Electronic Research and Development Centre, Bangalore	1.01
10.	National Centre for Software Technology, Mumbai	3.88
11.	Centres for Electronics Design and Technology of India, Aurangabad	0.54
12.	Software Technology Parks of India	3.08
13.	Centre for Materials for Electronics Technology Research	NA
14.	Centre for Liquid Crystal Research	NA
	Total	26.77
	Department of Environment, Forests and Wildlife	
15.	Central Pollution Control Board, New Delhi	11.63
16.	Indian Institute of Forest Management, Bhopal	2.62
17.	Wild Life Institute of India, Dehradun	4.40
18.	Indian Council of Forestry Research & Education, Dehradun	52.50
19.	Central Zoo Authority of India, New Delhi	3.30
20.	Padmaja Naidu Himalayan Zoological Park, Darjeeling	0.06
21.	G.B. Pant Himalayan Paryavaran Evam Vikas Sansthan, Almora	4.57
22.	Indian Plywood Research and Training Institute, Bangalore	1.29

23.	Animal Welfare Board of India, Chennai	2.15
24.	Centres for Excellence	6.04
25.	Indian Institute of Forest Productivity, Ranchi	NA
	Total	88.56
	Department of Science and Technology	
26.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram	18.05
27.	National Institute of Immunology, New Delhi	9.20
28.	Raman Research Institute, Bangalore	7.69
29.	Bose Institute, Calcutta	6.40
30.	Indian Institute of Tropical Meteorology, Pune	3.94
31.	Indian Association for Cultivation of Science, Calcutta	7.68
32.	Indian Institute of Astrophysics, Bangalore	13.12
33.	Indian Institute of Geo-Magnetism Mumbai	5.84
34.	Indian Science Congress Association, Calcutta	0.74
35.	Indian National Science Academy, New Delhi	5.42
36.	Birbal Sahni Institute of Palaeobotany, Lucknow	3.90
37.	Wadia Institute of Himalayan Geology, Dehradun	3.80
38.	S.N.Bose National Centre for Basic Sciences, Calcutta	2.62
39.	Maharashtra Association for Cultivation of Science, Pune	2.81
40.	Indian Academy of Sciences, Bangalore	1.35
41.	Institute for Plasma Research, Ahmedabad	9.11
42.	J.N. Centre for Advanced Scientific Research, Bangalore	5.17
43.	National Academy of Science, Allahabad	0.44
44.	Technology Information Forecasting and Assessment Council, New Delhi	4.97
45.	Vigyan Prasar, New Delhi	0.75
46.	Technology Development Board, New Delhi	NA
	Total	113.00
	Department of Space	
47.	National Remote Sensing Agency, Hyderabad	17.50
48.	Physical Research Laboratory, Ahmedabad	NA
49.	National MST Radar Facility	NA
	Total	17.50
	Department of Agriculture Research and Education	
50.	Indian Council of Agricultural Research, New Delhi	547.62
	Total	547.62

	Ministry of Health and Family Welfare	
51.	Indian Council of Medical Research, New Delhi	63.70
	Total	63.70
	Department of Scientific and Industrial Research	
52.	Council for Scientific and Industrial Research, New Delhi	444.00
	Total	444.00
	Department of Telecommunications	
53.	Centre for Development of Telematics (C-DOT)	54.20
	Total	54.20
	Planning Commission	
54.	Regional Computer Centre, Calcutta	0.20
	Total	0.20
	Grand Total	**1465.86**

Appendix II

Outstanding Utilisation Certificates

(Reference - Paragraph 1.2 at page 7)

(Rs.in lakh)

Ministry/Department	Period to which grant relates	Number of utilisation certificates outstanding at the end of March 1997	Amount
Atomic Energy	1985-86	1	1.50
	1987-88	1	0.86
	1988-89	2	2.96
	1989-90	2	0.57
	1990-91	2	1.14
	1991-92	1	2.51
	1992-93	3	1.82
	1993-94	5	6.39
	1994-95	15	22.38
	1995-96	28	38.46
	Total	60	78.59
Environment	1980-81	20	22.10
and Forests	1981-82	60	32.15
	1982-83	81	127.02
	1983-84	215	209.15
	1984-85	209	377.01
	1985-86	245	715.39
	1986-87	204	1306.79
	1987-88	515	11006.02
	1988-89	501	3057.16
	1989-90	635	316.77
	1990-91	79	193.16
	1991-92	112	1748.64
	1992-93	297	3471.44
	1993-94	105	151.62
	1994-95	267	1549.98
	1995-96	89	149.60
	Total	3634	24434.00

Ocean Development	1983-84	23	250.52
	1984-85	25	24.22
	1985-86	50	45.13
	1986-87	33	60.51
	1987-88	33	371.39
	1988-89	91	193.36
	1989-90	160	715.85
	1990-91	53	497.16
	1991-92	99	1258.72
	1992-93	18	13.91
	1993-94	76	1115.19
	1994-95	106	893.48
	1995-96	67	102.43
	Total	834	5541.87
Space	1976-77	1	0.05
	1977-78	1	0.15
	1978-79	2	0.08
	1979-80	2	0.21
	1980-81	5	0.72
	1981-82	7	4.63
	1982-83	21	7.33
	1983-84	13	3.77
	1984-85	27	7.12
	1985-86	15	3.28
	1986-87	16	5.65
	1987-88	14	5.60
	1988-89	9	8.18
	1989-90	4	3.18
	1990-91	7	7.84
	1991-92	7	5.30
	1992-93	10	16.88
	1993-94	27	38.75
	1994-95	40	210.82
	1995-96	19	70.29
	Total	247	399.83
Geological Survey of India Department of Mines	1991-92	1	0.10
	1992-93	2	0.15
	1993-94	1	0.05
	1994-95	3	0.35

	1995-96	29	2.57
	Total	36	3.22
Electronics	1986-87	26	176.70
	1987-88	31	232.68
	1988-89	59	562.25
	1989-90	138	1459.37
	1990-91	121	1614.73
	1991-92	138	1891.89
	1992-93	140	1932.05
	1993-94	183	1834.36
	1994-95	228	3666.80
	1995-96	247	6441.42
	Total	1311	19812.25
Non-Conventional Energy Sources	1994-95	310	2404.00
	1995-96	153	556.00
	Total	63	2960.00
	Grand Total	**6585**	**53229.76**

Appendix III

Outstanding Action Taken Notes

(Reference - Paragraph 1.3 at page 9)

Sl. No.	Report No. and years	Chapter of the Report	Para No.	Pertains to	Brief Subject
1.	6 of 1995	VI	6.1	Geological Survey of India	Avoidable payment of Customs duty
2.	6 of 1996	III	3.1	Ministry of Non-Conventional Energy Sources	Audit review on National Programme on Improved Chulhas
3.	-do -	- do -	3.2	-do-	Wasteful expenditure
4.	5 of 1997	II	2.1	Department of Atomic Energy	Idle equipment
5.	- do -	- do -	2.2	- do -	Avoidable expenditure due to delay in installation of capacitors
6.	- do -	III	3.1	Department of Ocean Development	Infructuous expenditure on procurement of Polar Bear II
7.	- do -	VI	6.1	Council for Scientific & Industrial Research	Regional Research Laboratory, Jorhat
8.	- do -	- do -	6.2	- do -	Central Electronic Engineering Research Institute, Pilani

Appendix IV

Categories of staff and grades in CSIR

(Reference - Paragraph 2.1.5 at page 14)

Scientific Staff		
Group/Designation	Grade	Pay scale (Rs.)
IV	1	2200-4000
IV	2	3000-4500
IV	3	3700-5000
IV	4	4500-5700
IV	5	5100-6300
IV	6	5900-6700
IV	7	5900-7300
Engineering Staff		
V(A)	1	1400-2300
V(A)	2	1640-2900
V(A)	3	2000-3500
V(A)	4	2200-4000
V(A)	5	3000-4500
V(B)	1	4500-5700
Technical Staff		
III	1	1400-2300
III	2	1640-2900
III	3	2000-3500
III	4	2200-4000
III	5	3000-4500
III	6	3700-5000
III	7	4500-5700
Supporting Staff		
II	1	950-1400
II	2	1350-2200
II	3	1400-2300
II	4	1640-2900
II	5	2000-3500
I	1	750-940
I	2	800-1150
I	3	950-1400
I	4	1350-2200

Administrative Staff

Sl No	Name of post	Pay scale (Rs.)
1.	Sr. Dy. Secretary/Sr. Controller of Administration	4500-5700
2.	Dy. Secretary/ Controller of Administration	3700-5000
3.	Under Secretary/Administrative Officer	3000-4500
4.	Section Officer (General)	2000-3500
5.	Assistant (General)	1640-2900
6.	U.D.C	1200-2040
7.	L.D.C.	950-1500
8.	Sr. Finance & Accounts Officer	3000-4500
9.	Finance & Accounts Officer	2200-4000
10.	Section Officer (Finance & Accounts)	2000-3200
11.	Assistant (Finance & Accounts)	1640-2900
12.	Stores & Purchase Officer	3000-4500
13.	Dy. Stores & Purchase Officer	2000-3500
14.	Stores & Purchase Assistant III	1640-2900
15.	Stores & Purchase Assistant IV	1200-2040
16.	Stores & Purchase Assistant V	950-1500
17.	Private Secretary/ Sr. Personal Assistant	2000-3500
18.	Sr. Stenographer	1640-2900
19.	Jr. Stenographer	1200-2040
20.	Group 'D' posts	950-1500 825-1200 800-1100 750-940

Appendix V

Expenditure on manpower in comparison to other components in CSIR

(Reference - Paragraph 2.1.6 at page 14)

(Rs.in crore)

	V th Plan	Plan Holiday 1979-80	VI th Plan	VII th Plan	Plan Holiday 1990-92	VIII th Plan
1. Manpower	93.75	20.89	195.04	428.31	248.58	1007.64
2. Office Establishment	22.25	4.72	45.05	92.69	56.72	242.84
3. Equipment	31.47	9.88	79.72	129.24	55.24	189.42
4. Other capital heads	23.64	5.53	70.66	137.10	51.42	176.72
5. Consumable and other R&D	22.76	5.42	50.54	82.32	46.56	164.33
6. Extra mural research and scientists pool	16.26	4.18	30.59	74.04	47.10	148.66
7. Other revenue expenditure	18.10	3.14	18.48	42.93	25.37	57.61
Total	228.23	53.76	490.08	986.63	530.99	1987.22

Appendix VI

Number of vacancies during 1992-96 in six laboratories and CSIR Headquarters

{ Reference - Paragraph 2.1.7 (a) at page 17 }

S. No	Name of laboratory	Sanctioned strength as on 1.4.1992	No. of vacancies				
			1.4.1992	1.4.1993	1.4.1994	1.4.1995	1.4.1996
1	CBRI						
i	Scientific	197	12	17	23	26	10
ii	Technical	352	18	17	21	28	7
iii	Administrative	154	8	15	25	25	20
2	CDRI						
i	Scientific	260	43	59	60	69	44
ii	Technical	568	39	51	61	75	25
iii	Administrative	173	50	46	47	36	53
3	IIP						
i	Scientific	190	12	13	61	36	21
ii	Technical	417	68	72	68	115	14
iii	Administrative	194	41	43	43	50	51
4	ITRC						
i	Scientific	128	17	19	20	23	12
ii	Technical	199	18	20	23	26	6
iii	Administrative	79	13	18	17	13	12
5	NPL						
i	Scientific	330	39	24	33	36	2
ii	Technical	792	81	40	47	68	37
iii	Administrative	349	33	39	32	30	50
6	SERC						
i	Scientific	54	22	24	24	26	22
ii	Technical	61	26	27	26	27	22
iii	Administrative	55	22	25	25	25	26
7	CSIR Hdqrs.						
i	Scientific	NS	NS	NS	NS	NS	NS
ii	Technical	NS	NS	NS	NS	NS	NS
iii	Administrative	NS	NS	NS	NS	NS	NS

NS - Not supplied

Appendix VII

Ratio of scientific to non-scientific personnel in six laboratories of CSIR

{ Reference - Paragraph 2.1.7 (b) at page 17}

Name of Laboratory	Position of staff as on									
	1.4.1992		1.4.1993		1.4.1994		1.4.1995		1.4.1996	
	SS	MIP	SS	MIP	SS	MIP	SS	MIP	SS	MIP
CBRI										
Scientific	197	185	197	180	196	173	195	169	176	166
Non-Scientific	506	480	517	485	517	471	516	463	485	458
Ratio	1:2.57	1:2.59	1:2.62	1:2.69	1:2.64	1:2.72	1:2.65	1:2.74	1:2.76	1:2.76
CDRI										
Scientific	260	217	260	201	260	200	260	191	234	190
Non-Scientific	741	652	741	644	761	653	760	649	705	627
Ratio	1:2.85	1:3.00	1:2.85	1:3.20	1:2.93	1:3.27	1:2.92	1:3.40	1:3.01	1:3.30
IIP										
Scientific	190	178	190	177	190	129	190	154	172	151
Non-Scientific	611	502	611	496	611	500	617	452	550	485
Ratio	1:3.22	1:2.82	1:3.22	1:2.80	1:3.22	1:3.88	1:3.25	1:2.94	1:3.20	1:3.28
ITRC										
Scientific	128	111	128	109	129	109	129	106	117	105
Non-Scientific	278	247	278	240	278	238	276	237	257	239
Ratio	1:2.17	1:2.23	1:2.17	1:2.20	1:2.16	1:2.18	1:2.14	1:2.24	1:2.20	1:2.28
NPL										
Scientific	330	291	316	294	318	285	318	282	284	282
Non-Scientific	1141	1027	1076	997	1078	999	1078	980	1007	920
Ratio	1:3.46	1:3.53	1:3.41	1:3.39	1:3.39	1:3.51	1:3.39	1:3.48	1:3.55	1:3.26
SERC										
Scientific	54	32	54	30	54	30	54	28	49	27
Non-Scientific	116	68	116	64	116	65	116	64	111	63
Ratio	1:2.15	1:2.13	1:2.15	1:2.13	1:2.15	1:2.17	1:2.15	1:2.29	1:2.27	1:2.33

SS - Sanctioned strength
MIP - Men-in-position

Appendix VIII

Regular staff in excess of sanctioned strength in CSIR

{ Reference -Paragraph 2.1.7 (c) at page 18 }

S. No	Name of laboratory	Group IV (Scientists)		Group III (Technicians)		Group II (Technicians)		Group I (Technicians)	
		SS	MIP	SS	MIP	SS	MIP	SS	MIP
1	CCMB	85	94	85	115	94	120	61	83
2	CECRI	213	224	118	129	218	224	-	-
3	CFRI	-	-	208	277	-	-	-	-
4	CGCRI	-	-	144	166	263	273	88	104
5	CMERI	170	186	-	-	220	385	-	-
6	ITRC	-	-	-	-	75	85	-	-
7	NBRI	105	122	-	-	121	126	184	187
8	NEERI	173	196	-	-	-	-	-	-
9	NIO	230	231	100	115	140	142	-	-
10	NISTADS	50	57	-	-	3	12	3	8
11	PID	90	95	75	93	31	51	15	45
12	RRL, Bhopal	42	51	20	23	-	-	-	-
13	RRL, Jorhat	135	139	20	23	-	-	-	-
14	RRL, Thiruvanan-thapuram	65	85	-	-	-	-	-	-
	Total	1358	1480	770	941	1165	1418	351	427
Excess posts operated			122		171		253		76

Appendix IX

Vacant posts not abolished in six laboratories and CSIR Headquarters

{ Reference - Paragraph 2.1.7 (d) at page 18 }

Sl. No	Name of laboratory	No. of vacancies lying unfilled for one year and more			
		1.4.1993	1.4.1994	1.4.1995	1.4.1996
1	CDRI				
i	Scientific	59	60	43	44
ii	Technical	51	61	39	25
iii	Administrative	39	43	42	46
2	IIP				
i	Scientific	13	61	36	21
ii	Technical	72	68	115	114
iii	Administrative	43	43	50	51
3	NPL				
i	Scientific	22	29	36	2
ii	Technical	40	47	68	37
iii	Administrative	39	30	30	50
4	SERC				
i	Scientific	24	24	26	22
ii	Technical	27	26	27	22
iii	Administrative	25	25	25	26
	Total	454	517	537	460

Note : CBRI, ITRC and CSIR Headquarters did not supply information

Appendix X

Regular staff employed for sponsored schemes by CDRI

{ Reference - Paragraph 2.1.8 (b) at page 23 }

Sl. No		Details of schemes	
		Regional Sophisticated Instrumentation Centre	Establishment of Sectoral Information Centre (NICDAP)
1	Date of Sanction	27.2.1975	29.9.1977
2	Initial period of Sanction	5 years	1 1/2 years
3	Approved manpower		
(a)	Scientific	2	1
(b)	Technical	7	5
(c)	Administrative	-	1
4.	Manpower deployed		
(a)	Scientific	4	10
(b)	Technical	17	23
(c)	Administrative	2	5
5.	Recruitment made (Regular) *		
(a)	Scientific	2	2
(b)	Technical	14	13
(c)	Administrative	-	6
6.	Recovery due from sponsor of scheme	Rs.49.20 lakh	Rs.35.51 lakh

* Besides, four casual workers were appointed for NICDAP scheme

Appendix XI

Violations of sanctioned strength in six laboratories of CSIR

{ Reference - Paragraph 2.1.8 (c) at page 24 }

	CBRI				CDRI				IIP				ITRC			
	SS	MIP	Others	Excess	SS	MIP	Others	Excess	SS	MIP	Others	Excess	SS	MIP	Others	Excess
1992-93																
Technical	352	334	63	45	568	529	86	47	417	349	10	--	199	181	--	--
Administrative	154	146	13	5	173	123	299	249	194	153	61	20	79	66	171	158
1993-94																
Technical	348	331	63	46	568	517	86	35	417	345	18	--	199	179	--	--
Administrative	169	154	13	--	173	127	299	253	194	151	64	21	79	61	169	151
1994-95																
Technical	345	324	63	42	568	507	86	25	417	349	21	--	198	175	--	--
Administrative	172	147	13	--	193	146	299	252	194	151	71	28	80	63	127	110
1995-96																
Technical	344	316	63	35	568	493	82	7	417	302	31	--	198	172	--	--
Administrative	172	147	13	--	192	156	302	266	200	150	91	41	78	65	69	56
1996-97																
Technical	318	311	62	55	512	487	82	57	350	336	59	45	179	173	--	--
Administrative	167	147	13	--	193	140	302	249	200	149	120	69	78	66	69	57

Note : NPL and SERC did not employ excess staff

Appendix XII

Cases of faster promotions in CSIR

{ Reference - Paragraph 2.1.9 (c) at page 31 }

Sl. No.	Name	Qualification	Appointment		No of promotions during 1.2.1981 to 31.3.1997	Dates of promotions	Designation and pay scale as on 31.3.1997
			Year	Post and pre-revised pay scale			
1.	A	Matric	1958	Peon Rs.70-85	3	4.2.1981 5.2.1987 1.4.1988	Technical Officer-III(4) (Xerox operator) Rs.2200-4000
2.	B	Matric	1959	III Division Clerk Rs.60-130	3	20.6.1985 20.6.1990 1.6.1993	Technical Officer-III(4) (Xerox operator) Rs.2200-4000
3.	C	M.Sc.	1978	Jr. Technical Assistant Rs.425-700	4	1.2.1981 1.2.1984 1.2.1989 1.2.1994	Scientist- IV (3) Rs.3700-5000
4.	D	M.Sc.	1965	Survey Assistant Rs.210-425	3	11.11.1983 11.11.1988 11.11.1993	Scientist -IV (4) (Editor) Rs.4500-5700
5.	E	M.A.	1974	Jr. Technical Assistant Rs.425-700	3	1.2.1981 1.2.1987 1.2.1992	Scientist -IV (3) Rs.3700-5000
6.	F	M.Sc.	1977	Sr. Scientific Assistant Rs.550-900	5	1.2.1981 1.2.1982 1.2.1987 1.2.1990 1.2.1995	Scientist -IV (4) Rs.4500-5700
7.	G	M.Sc.	1967	Jr. laboratory Assistant Rs.110-200	4	19.12.1980 1.2.1981 1.2.1986 1.2.1989	Scientist -IV (3) Rs.3700-5000
8.	H	M.Sc.	1981	Sr. Technical Assistant Rs.550-900	3	1.4.1982 (in less than one year) 1.4.1985 1.4.1990	Scientist -IV (2) Rs.3000-4500
9.	I	M.Sc.	1972	Translator Rs.325-575	3	1.2.1981 1.2.1986 1.2.1989	Scientist -IV (3) Rs.3700-5000
10.	J	M.Sc.	1970	Sr. Laboratory Assistant Rs.150-300	3	1.2.1981 1.2.1986 1.2.1991	Scientist -IV (3) Rs.3700-5000

Appendix XIII

Retrospective promotions in six laboratories and CSIR Headquarters

{ Reference - Paragraph 2.1.9 (d) at page 31 }

			Range of retrospective benefit			
Sl. No	Name of laboratory	Total Number of promotions	Upto one year	1-3 years	3-5 years	More than 5 years
1	CBRI					
i	Scientific	81	-	33	46	2
ii	Technical	199	5	144	49	1
2	CDRI					
i	Scientific	141	-	136	5	-
ii	Technical	290	4	257	29	-
3	IIP					
i	Scientific	38	-	-	38	-
ii	Technical	201	-	158	43	-
4	ITRC					
i	Scientific	63	2	51	10	-
ii	Technical	87	8	67	11	1
5	NPL					
i	Scientific	117	1	50	66	-
ii	Technical	250	2	151	97	-
6	SERC					
i	Scientific	16	-	3	11	2
ii	Technical	33	-	4	27	2
7	CSIR Hdqrs.					
i	Scientific	28	2	11	15	-
ii	Technical	123	3	79	33	8

Appendix XIV

Administrative posts before and after the cadre reviews in CSIR

{ Reference - Paragraph 2.1.9 (e) at page 33 }

Sl No	Name of posts	Corresponding pay scale (Rs.)	Total No. of posts Before cadre reviews	After cadre reviews
1.	Sr. Dy. Secretary/Sr. Controller of Administration	4500-5700	-	8
2.	Dy. Secretary/ Controller of Administration	3700-5000	24	59
3.	Under Secretary/Administrative Officer	3000-4500	36	48
4.	Section Officer (General)	2000-3500	111	195
5.	Assistant (General)	1640-2900	259	1042
6.	U.D.C	1200-2040	640	785
7.	L.D.C.	950-1500	837	306
8.	Sr. Finance & Accounts Officer	3000-4500	24	40
9.	Finance & Accounts Officer	2200-4000	34	25
10.	Section Officer (Finance & Accounts)	2000-3200	67	112
11.	Assistant (Finance & Accounts)	1640-2900	NA	103
12.	Stores & Purchase Officer	3000-4500	20	45
13.	Dy. Stores & Purchase Officer	2000-3500	21	84
14.	Stores & Purchase Assistant III	1640-2900	84	179
15.	Stores & Purchase Assistant IV	1200-2040	146	126
16.	Stores & Purchase Assistant V	950-1500	84	49
17.	Private Secretary/ Sr. Personal Assistant	2000-3500	116	149
18.	Sr. Stenographer	1640-2900	235	635
19.	Jr. Stenographer	1200-2040	555	287
20.	Group 'D' posts (i) Rs.950-1500 (ii) Rs.825-1200 (iii) Rs.800-1100 (iv) Rs.750-940		 - 54 331 1332	 165 - 1078 593
21.	Isolated posts		NA	NA

Appendix-XV

Equipment lying idle in ICAR's Institutes

(Reference - Paragraph 8.1.5 (a) (ii) at page 114)

Sl. No.	Name of Institute	Name of Equipment/ Machinery	Cost (Rs.in lakh)	Month since when lying idle	Remarks
1.	IGFRI Jhansi	AC Plant	7.30	4/95	No efforts were made by Institute to set it right
2.	NBAGR Karnal	Equipment for ARIS CELL	11.28	5/96	For want of infrastructure
3.	-do-	Transformer	02.05	6/96	For want of control panels
4.	IVRI Izatnagar	Spectroflurometer	3.83	9/85	Parts for the equipment received in defective condition and firm ceased to exit
5.	-do-	Cell Harvester	3.80	8/87	Indian agent did not turn up for installation of equipment
6	-do-	UV Microplate Reader	2.76	11/89	Short supply of printer cable
7.	-do-	Chemitrics Analyser	3.79	5/85	Non-replacement of spare part
8.	-do-	Tas Plus image Analysis system	23.00	9/85	For want of requisite software and trained personnel
9.	-do-	Sledge Cryo micro tome	7.72	2/86	Defective parts not replaced
10.	-do-	Fermentor	5.00	1/87	Defect not rectified
11.	Directorate IARI	Generating set	2.78	3/94	For want of load
12.	Mycology IARI	Air-conditioners	1.45	4/93	For want of space for installation
13	IISR Lucknow	Automatic weather Station	2.10	6/95	Local agent could not install the equipment
TOTAL COST			76.86		

Appendix-XVI

Delay in installation of equipment/machinery in ICAR's institutes

(Reference - Paragraph 8.1.5 (b) (ii) at page 115)

Unit	Equipment/ Machinery	Cost (Rs.in lakh)	Month of receipt	Month of installation	Delay in installation (in months)	Remarks
1. CISH Lucknow	Image system	4.60	3/94	1/95	10	Delay in receipt of replacement for defective parts
2. -do-	Incubator	0.96	3/92	5/94	26	Local agent did not turn up for installation
3. -do-	Air generators	4.02	9/93	1/95	16	Late receipt of replacement for defective part
4.Mycology IARI	Lab bio reactor	4.42	4/92	8/94	28	Failure of Indian agents to install the equipment
5. -do-	Water purifier	2.47	7/92	7/93	12	Delay in receipt of replacement of defective parts
6. -do-	Spectro photo meter	2.04	7/92	5/93	10	The firm did not turn up for installation in time
7. -do-	HPLC	12.45	7/94	11/95	16	Delay in completion of infrastructure facility
8. Entomo-logy IARI	Image Analyser	6.38	8/96	2/97	6	Short supply
9. DWR Karnal	Olympus Research Microscope	0.75	4/95	12/95	8	Reasons not furnished
10. BTC IARI	Laminar Airflow	1.70	4/92	1/95	33	Delay in completion of infrastructure facility
11. BTC	Water Purification System	5.45	6/92	6/95	36	-do-
12. BTC	RO 250 system	5.82	6/92	6/95	36	-do-
13.NBAGR	CO^2 Incubator	11.10	5/95	12/96	19	Non-availability of CO^2 gas cylinders
14. -do-	Millipore Water purification System	2.94	7/94	2/97	32	Reasons not furnished

15. -do-	Ultra centrifuge	16.84	8/95	7/97	24	Vacuum pump not functioning
16. CSWRI Avikanagar	Friction spinning mill	36.96	5/95	11/95	6	Reasons not furnished
17. -do-	Universal Testing Machine	17.25	3/95	1/97	22	Reasons not furnished
18. -do-	Elisa reader	2.62	3/95	10/96	20	Indian agents did not install the equipment
19. -do-	CO_2 Incubator	2.90	7/94	11/95	16	Reasons not furnished
20. -do-	Blood Cell analyser	5.90	6/96	4/97	10	Indian agents could not install the equipment
21. -do-	HPLC	20.78	1/96	11/97	22	Short shipping of items
22. IGFRI Jhansi	Nitrogen Analyser	5.02	9/95	2/97	17	Reasons not furnished
	Total	**173.37**				