



सत्यमेव जयते

Report of the Comptroller and Auditor General of India for the year ended March 2012



**Union Government
Scientific and Environmental
Ministries/Departments**

Report No. 22 of 2013
(Compliance Audit)

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Preface

This Report of the Comptroller and Auditor General of India has been prepared for submission to the President under Article 151 of the Constitution for being laid before the Parliament.

The report, covering the one year period 2011-12, contains significant results arising from test audit of transactions of Scientific and Environmental Ministries/Departments of the Union Government, autonomous bodies funded by these Ministries/Departments and other scientific institutions engaged in research and development and scientific pursuit.

This Report contains 12 audit paragraphs, which include three long paragraphs on:

- *EDUSAT Utilisation Programme of Indian Space Research Organisation*
- *Public Private Partnership for setting up of 'The Centre for Genomic Application' by Institute of Genomics and Integrative Biology*
- *Maintenance of Farakka Barrage and its ancillaries*

The observations in this Report are those which were noticed by Audit during 2012-13. For completeness, the observations relating to earlier years, not covered in the previous Reports, have also been included, wherever pertinent. Similarly, results of audit of transactions subsequent to March 2013 have also been mentioned, wherever relevant.

Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.



Overview

Introduction

This report of the Comptroller and Auditor General of India (C&AG) relates to matters arising from compliance audit of the transactions of nine Scientific and Environmental Ministries/Departments of the Government of India. The report contains eight chapters. Chapter I, in addition to explaining the objective of preparing this report, defines audit scope and methodology and also provides a synopsis of significant audit findings and observations. Chapters II to VIII present detailed findings/observations arising out of the compliance audit of Scientific and Environmental Ministries/Departments and the research centres, institutes and autonomous bodies under them.

Important areas of concern highlighted in the current report fall under the following broad categories:

- **Inefficient project management;**
- **Weaknesses in procurement and contract management;**
- **Financial benefits extended to employees without requisite approvals; and**
- **Deficient internal controls**

An overview of the specific audit findings included in this report is given below:

Inefficient project management

EDUSAT Utilisation Programme

EDUSAT, launched by the Department of Space in September 2004 was India's first thematic satellite dedicated exclusively for educational services to provide distance education service to remote areas of India. The total investment was ₹549.09 crore comprising of direct investment of ₹282.76 crore towards the launch of the spacecraft and further expenditure of ₹266.33 crore on establishment of ground network.

It was observed in audit that EDUSAT failed to effectively achieve its objectives due to deficiencies in planning for the network connectivity, content generation and failure to have a robust management structure. There were deficiencies in actual

implementation of the programme such as delay in establishment of ground network, idling of network connectivity, disparities in the allocation and idling of satellite bandwidth, inadequate content generation and deficiencies in monitoring and evaluation. The replacement strategy for the existing satellite was also deficient resulting in idling of operational networks. Thus, the objectives of implementation of EDUSAT could not be met fully even at the end of its life.

(Paragraph 3.1)

Public Private Partnership for setting up ‘The Centre for Genomic Application’ by Institute of Genomics and Integrative Biology

Institute of Genomics and Integrative Biology (IGIB) signed an agreement with the Institute of Molecular Medicine (IMM), a private partner for setting up ‘The Centre for Genomic Application’ (TCGA). IGIB did not follow due diligence before selecting the private partner. The agreement with IMM did not have adequate provisions for safeguarding interests of Government. TCGA could not achieve self-sufficiency, as envisaged. The pricing policy for its services was uneconomical. The financial practices of TCGA leaned in favour of the private partner, due to undercharging of services rendered, booking of expenditure unrelated to TCGA in its accounts and not charging the partner for use of equipment belonging to IGIB. The monitoring mechanism established for TCGA was lax. Advisory Council of TCGA did not issue the policy framework and guidelines for operation of TCGA by the private partner. The objective of TCGA in becoming a national research facility and a shared resource for use by universities, industries and laboratory groups remained largely unachieved. The activities of TCGA were suspended in August 2011.

(Paragraph 4.1)

Unfruitful expenditure

Central Institute of Mining and Fuel Research, a constituent unit of Council of Scientific and Industrial Research, failed to utilise technology of energy efficient coke oven in development of a demonstration/commercial plant. As a result, expenditure of ₹2.14 crore incurred on the project was rendered unfruitful.

(Paragraph 4.2)

Maintenance of Farakka Barrage and its ancillaries

Maintenance of the Farakka Barrage constructed by Government of India during the 1970s was inadequate. Consequently, there were major gate failures on six occasions from 1985 to 2011, major systems such as remote control systems for the gates and navigational lock of the barrage remained inoperative for nearly three decades. The project management did not have enough spare gates as prescribed by the Central Water Commission norms. Bed protection works and maintenance works

on the feeder canal were not undertaken. No action for preventive maintenance of the barrage structures was taken.

(Paragraph 7.1)

Weaknesses in procurement and contract management

Avoidable expenditure on compensation due to breach of agreement

Nuclear Fuel Complex (NFC) entered into an agreement for procurement of a minimum quantity of magnesium granules from a private firm for a period of seven years. No clause to cover deviations in the procurement quantity was included in the agreement. In the meantime, the requirement shifted to magnesium chips from magnesium granules. NFC could not revise the agreement and also failed to document the proceedings of an important meeting with the firm on the issue, resulting in avoidable payment of ₹1.43 crore towards compensation due to breach of agreement.

(Paragraph 2.1)

Hasty procurement of equipment without creating infrastructure facilities for installation

Saha Institute of Nuclear Physics, Kolkata could not install equipment of ₹38.90 crore for want of required infrastructure.

(Paragraph 2.2)

Parking of a foreign satellite in Indian Administration coordinated orbital slot

Department of Space allowed a foreign private satellite service provider to park its satellite in an orbital slot coordinated by the Indian Administration and meant for Indian Satellites, in violation of the country's SATCOM policy and International Telecommunication Union's radio regulations.

(Paragraph 3.2)

Loss due to unsafe transport and belated insurance of consignment

Liquid Propulsion Systems Centre, Mahendragiri did not ensure safe sea transport of a Liquid Hydrogen Storage Tank procured at a cost of ₹6.15 crore resulting in extensive damage to the consignment, due to which additional expenditure of ₹1.36 crore was incurred on repair. Insurance claim of ₹3.39 crore was also rejected by the Insurance Company due to delay in obtaining the insurance cover.

(Paragraph 3.3)

Financial benefits extended to employees without requisite approvals

Inadmissible payment of Transport Allowance

Jawaharlal Nehru Centre for Advanced Scientific Research irregularly paid transport allowance of ₹69.93 lakh to its employees who were utilising Institute's transport facility.

(Paragraph 5.2)

Repeated unauthorised creation and up-gradation of posts by Central Pollution Control Board

Central Pollution Control Board (CPCB), an autonomous institution under the Ministry of Environment and Forests (MoEF), created and upgraded posts in violation of orders of Ministry of Finance, did not comply with guidelines on ad-hoc appointments and incurred a recurring financial burden of more than ₹3.22 crore per annum on the exchequer. The repeated breach of delegation of powers by CPCB indicates the lack of control and monitoring by MoEF over the units under its administrative jurisdiction.

(Paragraph 6.1)

Irregular introduction of pension scheme and diversion of funds

Indian National Centre for Ocean Information Services, Hyderabad, irregularly introduced a pension scheme for its employees in violation of the orders of Ministry of Finance.

(Paragraph 8.1)

Deficient internal controls

Avoidable expenditure on hiring of office premises

Science and Engineering Research Board failed to occupy the premises hired from a private agency, for its office for 22 months and incurred avoidable expenditure of ₹8.84 crore towards rent.

(Paragraph 5.1)

CHAPTER - I

Introduction

1.1 About this Report

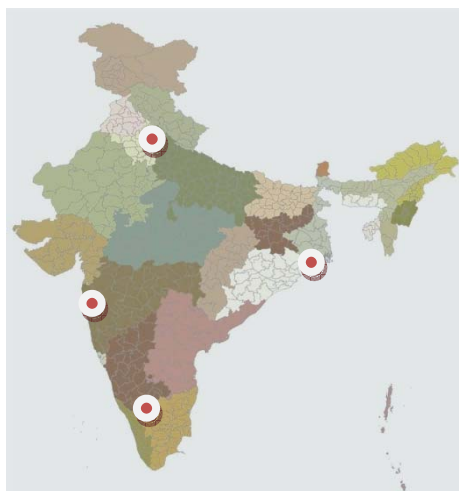
This report of the Comptroller and Auditor General of India (C&AG) relates to matters arising from compliance audit of the transactions of the Scientific and Environmental Ministries/Departments of the Government of India and the autonomous bodies under their administrative control, for the year 2011-12.

Compliance audit refers to examination of the transactions relating to expenditure, receipts, assets and liabilities of Government to ascertain that the provisions of the Constitution of India and the applicable laws, rules, regulations, orders and instructions issued by the competent authorities are being complied with. Compliance audit also includes an examination of the rules, regulations, orders and instructions to determine their legality, adequacy, transparency, propriety, prudence as also their effectiveness in terms of achievement of the intended objectives.

The primary purpose of the Report is to bring to the notice of the Parliament, important results of audit. Auditing Standards require that the materiality level for reporting be commensurate with the nature, volume and magnitude of transactions. The findings of audit are expected to enable the Executive to take corrective actions as also to frame policies and directives that will lead to improved financial management of the organisations, thus, contributing to better governance.

This chapter, in addition to explaining the planning and extent of audit, provides a synopsis of the significant audit observations followed by a brief analysis of the expenditure of Scientific and Environmental Ministries/Departments, position of outstanding utilisation certificates, position of proforma accounts of departmentally managed government undertakings, losses and irrecoverable dues written off/waived and follow-up on audit reports. Chapters II to VIII present findings/observations arising out of the compliance audit of Scientific and Environmental Ministries/Departments and the research centres, institutes and autonomous bodies under them. Weaknesses that exist in the system of project management, financial management, internal controls etc., in various scientific and environmental institutions are also highlighted in the report.

1.2 Organisational Structure of the office of the Principal Director of Audit, Scientific Departments



Location of Scientific Audit Offices

The office of the Principal Director of Audit, Scientific Departments, New Delhi was established as a separate office in April 1986 for the audit of Ministries/Departments of Union Government operating in the field of Science and Technology. With the increasing attention on environment protection and conservation issues within the country and global trend among Supreme Audit Institutions (SAIs)

for special focus on the audit of environment related matters, the C&AG designated the office of the Principal Director of Audit, Scientific Departments as the nodal office for Environmental Audit.

It has three branch offices located at Mumbai, Kolkata and Bangalore and a sub-office at Chennai, which assist the Principal Director of Audit, Scientific Departments in carrying out the audit of Union Government Scientific and Environmental Ministries/Departments as well as the subordinate/attached offices and autonomous bodies under them.

1.3 Profile of audited entities

Up to March 2012, the office of the Principal Director of Audit, Scientific Departments was responsible for audit of units under 14 Ministries/Departments. Following re-structuring of work of field audit offices under the Indian Audit and Accounts Department, the sphere of audit of the office was revised with effect from 1 April 2012. The revised audit domain extends over nine Scientific and Environmental Ministries/Departments of the Government of India, listed below:

- **Department of Atomic Energy (DAE)**
- **Ministry of Earth Sciences (MoES)**
- **Ministry of Environment and Forests (MoEF)**
- **Ministry of New and Renewable Energy (MNRE)**
- **Department of Space (DOS)**

- **Ministry of Science and Technology comprising of:**
 - **Department of Science and Technology (DST)**
 - **Department of Scientific and Industrial Research (DSIR) and**
 - **Department of Biotechnology (DBT)**
- **Ministry of Water Resources (MoWR)**

This report covers the audit findings in respect of the above Scientific and Environmental Ministries/Departments and their autonomous bodies only.

A brief profile of these Ministries/Departments is discussed in **Appendix I**.

The comparative position of expenditure of the Scientific and Environmental Ministries/Departments during 2011-12 and in the preceding two years is given below:

(₹in crore)

Table 1 - Details of expenditure incurred by Scientific and Environmental Ministries/Departments

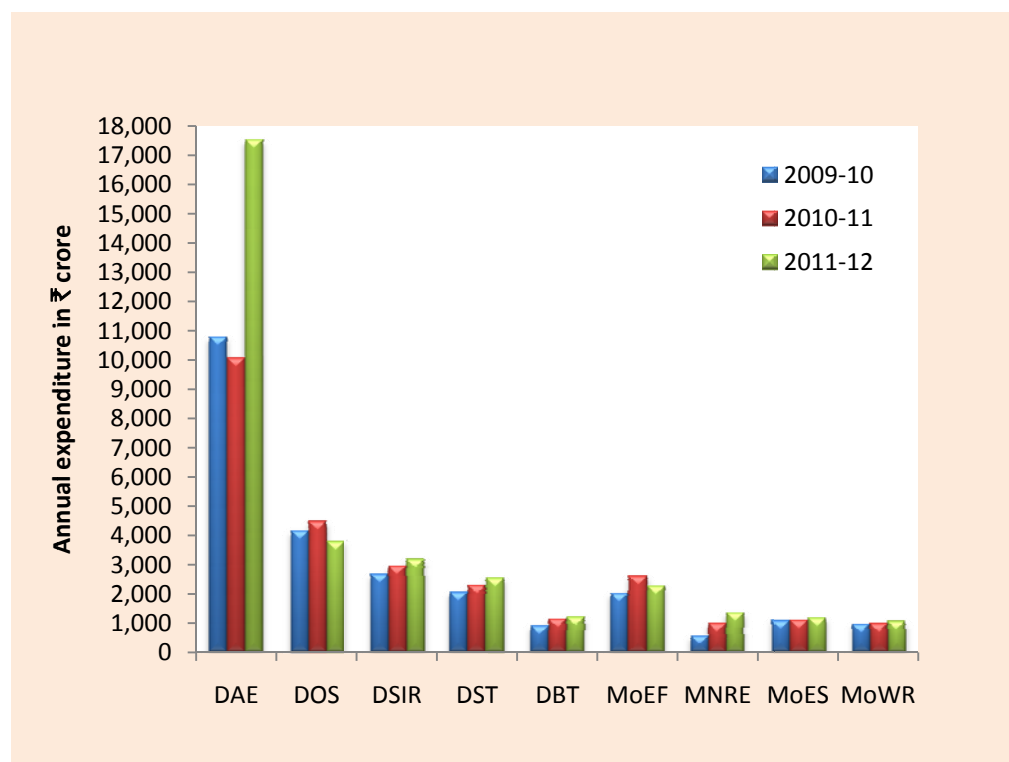
Sl. No.	Ministry/Department	2009-10	2010-11	2011-12
1.	Department of Atomic Energy	10,777.70	10,057.23	17,516.61
2.	Department of Space	4,162.96	4,482.23	3,790.79
3.	Department of Scientific and Industrial Research	2,697.31	2,982.68	3,214.70
4.	Department of Science and Technology	2,045.10	2,280.76	2,521.47
5.	Department of Biotechnology	906.56	1,144.87	1,208.43
6.	Ministry of Environment and Forests	2,021.71	2,608.92	2,270.00
7.	Ministry of New and Renewable Energy	563.40	994.81	1,365.22
8.	Ministry of Earth Sciences	1,080.54	1,098.08	1,174.60
9.	Ministry of Water Resources	969.24	992.79	1,066.03
Total		25,224.52	26,642.37	34,127.85
Percentage increase/decrease		21.13¹	5.62	28.10

Source : Appropriation Accounts of the respective years

The total expenditure on above listed Ministries/Departments of the Government of India during 2011-12 was ₹34,127.85 crore. Of this nearly 51 per cent of the expenditure was incurred by Department of Atomic Energy alone, followed by Department of Space (11 per cent) and Department of Scientific and Industrial Research (9 per cent).

¹ Calculated on the basis of expenditure of ₹20,824.63 crore incurred in 2008-09

Chart 1 - Expenditure incurred by Scientific and Environmental Ministries/ Departments



While there was a significant increase of 21 *per cent* in the overall expenditure of the Scientific and Environmental Ministries/Departments during 2009-10 over 2008-09, the increase was a moderate six *per cent* during 2010-11 over 2009-10. During the next year 2011-12 however, there was a steep rise in total expenditure by 28 *per cent*. This was mainly due to the sharp increase in expenditure of Department of Atomic Energy and Ministry of New and Renewable Energy by 74 *per cent* and 37 *per cent* respectively.

1.4 Authority for Audit

The authority for audit by the C&AG is derived from Articles 149 and 151 of the Constitution of India and the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. C&AG conducts audit of expenditure of Ministries/Departments of the Government of India under Section 13² of the C&AG's (DPC) Act³. C&AG is the sole auditor in respect of autonomous bodies under the Scientific and Environmental Ministries/Departments which are audited under sections 19(2)⁴ and 20(1)⁵ of the

² Audit of (i) all expenditure from the Consolidated Fund of India, (ii) all transactions relating to Contingency Funds and Public Accounts and (iii) all trading, manufacturing, profit and loss accounts, balance-sheets and other subsidiary accounts.

³ Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

⁴ Audit of the accounts of corporations (not being companies) established by or under law made by Parliament in accordance with the provisions of the respective legislations.

⁵ Audit of accounts of any body or authority on the request of the President, on such terms and conditions as may be agreed upon between the C&AG and the Government.

C&AG's (DPC) Act. In addition, C&AG also conducts supplementary/superimposed audit of their autonomous bodies under Sections 14⁶ and 15⁷ of C&AG's (DPC) Act, which are substantially funded by the Government of India and whose primary audit is conducted by Chartered Accountants. Principles and methodologies for compliance audit are prescribed in the Regulations on Audit and Accounts, 2007 issued by the C&AG.

1.5 Planning and conduct of Audit

Compliance audit is conducted in accordance with the principles and practices enunciated in the auditing standards promulgated by the C&AG. The audit process starts with the assessment of risk of the Ministry/Department as a whole and each unit based on expenditure incurred, criticality/complexity of activities, level of delegated financial powers, assessment of overall internal controls and concerns of stakeholders. Previous audit findings are also considered in this exercise. Based on this risk assessment, the frequency and extent of audit are decided. An annual audit plan is formulated to conduct audit on the basis of such risk assessment.

After completion of audit of each unit, Inspection Reports containing audit findings are issued to the head of the unit. The units are requested to furnish replies to the audit findings within one month of receipt of the Inspection Report. Whenever replies are received, audit findings are either settled or further action for compliance is advised. The important audit observations arising out of these Inspection Reports are processed for inclusion in the audit reports which are submitted to the President of India under Article 151 of the Constitution of India.

During 2011-12, 3,566 audit party-days were used to carry out compliance audit of 215 out of 556 units of Scientific and Environmental Ministries/Departments. Our audit plan covered those units/entities which were vulnerable to significant risk, as per our assessment.

⁶ Audit of (i) all receipts and expenditure of a body/authority substantially financed by grants or loans from the Consolidated Fund of India and (ii) all receipts and expenditure of any body or authority where the grants or loans to such body or authority from the Consolidated Fund of India in a financial year is not less than ₹ one crore.

⁷ Audit of grant or loan given for any specific purpose from the Consolidated Fund of India to any authority or body, to scrutinise the procedures by which the sanctioning authority satisfies itself as to the fulfillment of the conditions subject to which such grants or loans were given.

1.6 Significant audit observations

In the last few years, Audit has reported on several significant deficiencies in critical areas which impact the effectiveness of functioning of Scientific and Environmental Ministries/Departments. The specific audit findings that have emerged from the audit of these Ministries/Departments during the last five years have been listed in **Appendix II**.

The current report brings out deficiencies in critical areas which impact the effectiveness of functioning of Scientific and Environmental Ministries/Departments/Organisations. The significant areas of concern requiring corrective action include:

- **Inefficient project management;**
- **Weaknesses in procurement and contract management;**
- **Financial benefits extended to employees without requisite approvals; and**
- **Deficient internal controls**

1.6.1 Inefficient project management

One of the most significant deficiencies, which audit has been pointing out is the failure of the scientific institutions to achieve project objectives set out by themselves in the project proposals. This issue is especially important as projects are taken up with clearly laid down deliverables, in the areas of both pure as well as applied scientific research. While we recognise the fact that the success of scientific endeavour cannot be predicted, the deficiencies pointed out are largely a result of poor project management, which is well within the control of these institutions.

The current report brings out the issues and problems faced by some of the scientific institutions in the implementation of their projects due to inefficient project management, which resulted in non-achievement/incomplete achievement of their stated objectives. These are (i) EDUSAT Utilisation Programme of ISRO (Para 3.1), (ii) Public Private Partnership of Institute of Genomics and Integrative Biology under DSIR for setting up The Centre for Genomic Application (Para 4.1) and (iii) Central Institute of Mining and Fuel Research under DSIR (Para 4.2). The report also brings out inadequate inspection and maintenance of the Farakka Barrage constructed on the river Ganga to facilitate water supply and river transport, which have compromised the safety and security of the critical operating structures of the barrage (Para 7.1).

1.6.2 Weaknesses in procurement and contract management

Scientific and Environmental Ministries/Departments spend a significant part of their budget on procurement of stores, equipment and services for successful implementation of projects. Some of these Departments like Atomic Energy and Space exercise enhanced financial powers in the purchase of stores and equipment in comparison to other Ministries/Departments of the Government of India.

The current report points out instances of weaknesses in procurement and contract management systems in Nuclear Fuel Complex and Saha Institute of Nuclear Physics under DAE (Paras 2.1 and 2.2), Indian Space Research Organisation and Liquid Propulsion Systems Centre under DOS (Paras 3.2 and 3.3).

1.6.3 Financial benefits given to employees without requisite approvals

Most of the autonomous bodies under the Scientific and Environmental Ministries/Departments are largely funded from grants provided by the Government of India. Their efforts to generate internal revenues have not yielded the desired results and in many cases, their dependence on government funding has increased over the years. Despite such dependence on the government for financial support, there have been increasing instances of these institutions granting substantially higher benefits to their employees. These benefits are extended irregularly, without the approval of the Ministry of Finance, thus, putting extra financial burden on the central exchequer.

The current report includes audit findings of grant of financial benefits to employees of autonomous bodies by Jawaharlal Nehru Centre for Advanced Scientific Research under DST (Para 5.2), Central Pollution Control Board under MoEF (Para 6.1) and Indian National Centre for Ocean Information Services under MoES (Para 8.1).

Such instances of grant of higher benefits by autonomous institutions must be reviewed by the Ministries concerned to ensure that extra financial burden is not put on the government without its approval.

1.6.4 Deficient internal controls

Internal controls are necessary to regulate the means by which the organisation's resources are mobilised and utilised economically and effectively. Government organisations need to impose stringent internal control measures and employ financial prudence in expenditure to ensure

that public funds are spent in accordance with rules and regulations and losses and wastages are minimal.

The current report brings out instances of avoidable and extra expenditure incurred due to inadequate internal control and financial management in Public Private Partnership arrangement of Institute of Genomics and Integrative Biology under DSIR for setting up The Centre for Genomic Application (Para 4.1) and Science and Engineering Research Board under DST (Para 5.1).

1.7 Budget and expenditure controls

A summary of Appropriation Accounts for 2011-12 in respect of Scientific and Environmental Ministries/Departments is given below:

(₹ in crore)

Table 2 - Details of grants received and expenditure incurred by Scientific and Environmental Ministries/Departments

Sl. No.	Ministry/Department	Grant/ Appropriation (including supplementary grant)	Expenditure	(-) Savings/ (+) Excess	Percentage of Unspent provision
1.	Department of Atomic Energy	18,812.64	17,516.61	-1,296.03	6.89
2.	Department of Space	6,626.06	3,790.79	-2,835.27	42.79
3.	Department of Scientific and Industrial Research	3,385.02	3,214.70	-170.32	5.03
4.	Department of Science and Technology	2,742.71	2,521.47	-221.24	8.07
5.	Department of Biotechnology	1,426.96	1,208.43	-218.53	15.31
6.	Ministry of Environment and Forests	2,784.17	2,270.00	-514.17	18.47
7.	Ministry of New and Renewable Energy	1,380.19	1,365.22	-14.97	1.08
8.	Ministry of Earth Sciences	1,569.16	1,174.60	-394.56	25.14
9.	Ministry of Water Resources	1,249.36	1,066.03	-183.33	14.67
Total		39,976.27	34,127.85	-5,848.42	14.63

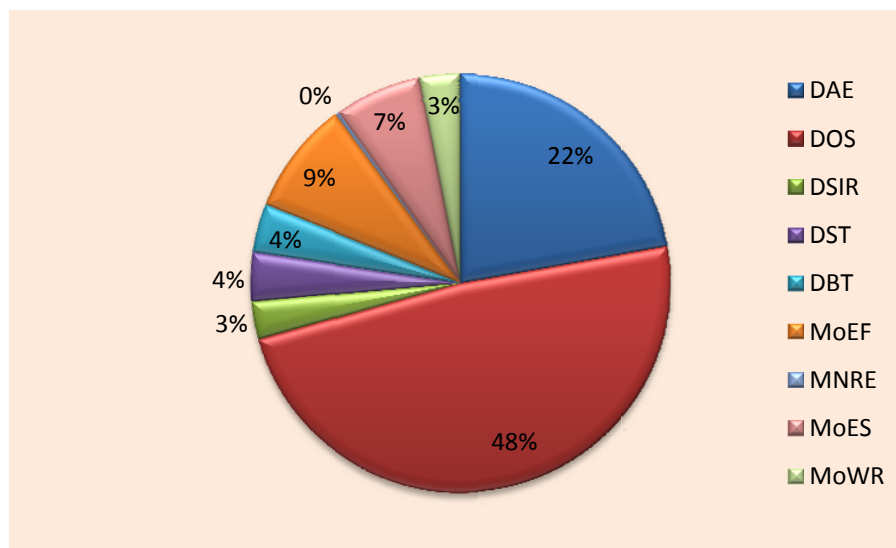
Source: Appropriation Accounts of the Ministries/ Departments for 2011-12

It would be seen from the above table that with reference to total budget allotment of ₹39,976.27 crore, the Scientific and Environmental Ministries/ Departments had an overall savings of ₹5,848.42 crore which constitutes 15 per cent of the total grant/appropriation. The Department of Space, Ministry of Earth Sciences, Ministry of Environment and Forests and Department of Biotechnology had significant savings of ₹2,835.27 crore (43 per cent),

₹394.56 crore (25 per cent), ₹514.17 crore (18 per cent) and ₹218.53 crore (15 per cent) respectively with reference to the funds released to these Ministries/Departments.

Out of the total savings of the Scientific and Environmental Ministries/Departments, the proportion of savings made by DOS was the highest, followed by DAE and MoEF respectively as shown below:

Chart 2- Ministry/ Department wise Percentage of savings to the total savings



Budget and expenditure controls in the Scientific and Environmental Ministries/Departments continue to be an area of concern, requiring attention and strengthening of control and oversight systems. C&AG's Report No.1 of 2013 mentions some of these areas in Chapters 3 and 4, which are briefly recapitulated below.

Savings of ₹100 crore or more

Savings in a grant or appropriation indicates deficient budgeting as well as shortfall in performance. Further, savings of ₹100 crore or above in any section of the grant need a detailed explanatory note to the Public Accounts Committee. Savings in excess of ₹100 crore were noticed under both Capital and Revenue heads in DAE, DOS and MoES. There were savings above ₹100 crore under Revenue heads in MoEF, DST, DSIR, DBT and MoWR. The unspent provisions ranged between ₹166.20 crore (MoWR) to ₹2,834.57 crore (DOS).

Persistent savings were observed in DAE and DOS under Capital head. The savings had increased progressively in DAE, from four per cent (2009-10) to 17 per cent (2010-11) and 24 per cent (2011-12). In DOS the savings ranged from 37 per cent (2009-10) to 28 per cent (2010-11) and 65 per cent (2011-12).

Unrealistic budgeting

Budgeting in the Scientific and Environmental Ministries/Departments was observed to be unrealistic. There were huge unspent provisions within the grants and funds received after supplementary grants and re-appropriations were eventually not utilised, indicating poor budgeting. Some of the significant observations in this regard are as below:

- MoEF sought a supplementary provision of ₹42 crore under the Capital (Voted) Section, which was 52 *per cent* of the original provision of ₹80.68 crore.
- In two cases, DAE and MoES made re-appropriations of ₹19.99 crore and ₹13 crore respectively, which was injudicious, as these re-appropriated funds were never utilised.
- In 14 cases of DAE, DST and DOS, the entire budget provision in the sub-heads remained unutilised.
- In 11 cases under DAE and DOS, the unspent provisions under the sub-heads alone was in excess of ₹100 crore.
- In 10 cases under DAE, DOS and MoES, there was unspent provision of 48 to 97 *per cent* of the budgeted provision under the sub-heads.

Surrender of savings

MoEF and DST surrendered major portion of their savings on the last day of the fiscal year. DST surrendered 90.4 *per cent* of its total savings on 31 March 2012. It was observed that under the Grant no 5- Nuclear Power Schemes of DAE, the amount surrendered (₹40.81 crore) was more than the savings (₹40.25 crore) under the grant.

Rush of expenditure

The quantum of expenditure incurred by DAE and DBT during the month of March 2012 was 17 and 18 *per cent* respectively, which was in excess of the prescribed quantum of 15 *per cent*. The expenditure incurred by MNRE during the last quarter of the financial year was to the extent of 42 *per cent* of the budget estimates which was in excess of the prescribed limit of 33 *per cent*.

Expenditure incurred without budget line

DOS incurred and booked an expenditure of ₹54.22 lakh on a new service for which no budget line was available. In April 2012, after the close of the

financial year, Department of Space amended the re-appropriation order and transferred this expenditure to two other heads.

Failure to obtain legislative approval for augmenting provision

Ministry of Finance issued (May 2012) clarification that the cases of augmentation of funds under the object heads 'Grants-in-aid', 'Subsidies' 'Machinery and equipment' and 'Major Works' under 'New Service/New instrument of service' and all cases relating to augmentation of funds above ₹2.5 crore or above 10 *per cent* of the provision under the object heads 'Major Works' and 'Machinery and equipment' would require prior approval of the Parliament. In the following cases, the augmentation was done without obtaining prior approval of the Parliament:

- In 129 cases of three⁸ Ministries/Departments, funds aggregating to ₹244.85 crore were augmented under the object heads 'Major Works' and 'Machinery and equipment'.
- In nine cases of seven⁹ Ministries/Departments expenditure of ₹20.64 crore was incurred by augmenting the provision under 'grants-in-aid' to various bodies/authorities.
- MNRE augmented the provision under the object head 'subsidy' to the extent of ₹15.70 crore.

Misclassification of expenditure

- Capital expenditure to the extent of ₹823.37 crore was misclassified and booked under Revenue expenditure by four¹⁰ Ministries/Departments.
- Revenue expenditure to the extent of ₹53.30 crore was booked under Capital expenditure by three¹¹ Ministries/Departments.
- DAE incorrectly booked an amount of ₹8.54 crore incurred towards Grants-in-aid under the object heads "Other Charges" and "Scholarships/Stipends".

⁸ DAE, DOS and MoEF

⁹ DAE, MoES, MoEF, DST, DBT, DOS and MoWR

¹⁰ DAE, MoES, DOS and MoWR

¹¹ DAE, MoES and MoWR

Expenditure incurred without prior authorisation

DAE incurred expenditure of ₹192.76 crore (June 2011 to February 2012) in excess of the available provision, without necessary prior authorisation. The re-appropriation order was issued only on 31 March 2012.

Non-operation of detailed head of Grants-in-aid Salaries

Ministry of Finance, Department of Expenditure notified (June 2011) introduction of new object head 36- Grants-in-aid-Salaries with effect from 1 April 2011, which would include amounts released as grants-in-aid for payment of salaries. DOS did not operate the new head but booked amount of ₹127.66 crore under the head Grants-in-aid-General.

Issue of deficient sanction orders

Although the Detailed Demand for Grants of DOS were prepared with full accounts classification up to the object head level on revenue and capital accounts separately for plan and non-plan expenditure, the sanction orders issued did not distinctly specify the amount of expenditure to be debited separately to revenue and capital accounts and plan and non-plan under revenue and capital accounts. Thus, the sanction orders issued by DOS were deficient, as they did not give clear directions with regard to proper booking and classification of expenditure.

Expenditure without adequate provisioning of funds

It was seen that the actual expenditure of ₹40.55 crore in 14 cases in DOS exceeded the available provision prior to issue of the re-appropriation orders, which was in violation of the extant rules.

1.8 Audit of accounts of Autonomous Bodies

Principal Director of Audit, Scientific Departments is the sole auditor of 10 autonomous bodies for which Separate Audit Reports (SAR) are prepared on their accounts under sections 19 (2) and 20 (1) of the C&AG's (DPC) Act, 1971. The total grants released to these autonomous bodies during 2011-12 were ₹3,394.48 crore, as detailed below:

(₹ in crore)

Table 3- Details of grants released to Central Autonomous Bodies

Sl.No.	Name of the Autonomous Body	Ministry/ Department	Amount of Grant released during 2011-12
1.	Council of Scientific and Industrial Research, New Delhi	DSIR	3,135.91
2.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram	DST	91.00
3.	Technology Development Board, New Delhi	DST	Nil
4.	National Tiger Conservation Authority, New Delhi	MoEF	14.71
5.	Wildlife Institute of India, Dehradun	MoEF	18.70
6.	Central Zoo Authority, New Delhi	MoEF	17.35
7.	National Biodiversity Authority, Chennai	MoEF	9.37
8.	Animal Welfare Board of India, Chennai	MoEF	24.09
9.	National Water Development Agency, New Delhi	MoWR	34.35
10.	Brahmaputra Board, Guwahati	MoWR	49.00
Total			3,394.48

Source: Separate Audit Reports of the Autonomous Bodies for the year 2011-12. Audit of Science and Engineering Research Board was entrusted during 2012-13.

In addition, supplementary/superimposed audit of 64 other autonomous bodies are conducted under Sections 14 or 15 of the C&AG's (DPC) Act, 1971. The total grants released to 57¹² autonomous bodies during 2011-12 were ₹3,301.75 crore, details of which are indicated in **Appendix III**.

1.9 Outstanding Utilisation Certificates

Ministries and Departments are required to obtain certificates of utilisation of grants from the grantees i.e., statutory bodies, non-governmental institutions etc., indicating that the grants had been utilised for the purpose for which these were sanctioned and where the grants were conditional, the prescribed conditions had been fulfilled. According to the information furnished by six¹³ Ministries/Departments, 8,865 utilisation certificates (UC) due by March 2012, for grants aggregating ₹1,091.72 crore were outstanding as given in **Appendix IV**.

Out of the 8,865 UCs awaited in respect of the six Ministries/Departments, 7,565 certificates amounting to ₹409.36 crore were pending for more than two years. A total of 6,232 UCs amounting to ₹288.18 crore were outstanding for more than five years.

¹² Information in respect of seven autonomous bodies was not furnished.

¹³ DAE, DOS, MoEF, MNRE, MoES and MoWR

Ministry/Department-wise position of outstanding UCs is given in the table below:

(₹ in crore)

Sl. No.	Ministry/Department	UCs pending for more than two years		UCs pending for more than five years	
		No.	Amount	No.	Amount
1.	Department of Atomic Energy	189	10.78	56	1.92
2.	Department of Space	162	12.58	105	9.04
3.	Department of Scientific and Industrial Research	Not available			
4.	Department of Science and Technology	Not available			
5.	Department of Biotechnology	Not available			
6.	Ministry of Environment and Forests	6,168	302.16	5,354	240.30
7.	Ministry of New and Renewable Energy	33	6.41	1	0.03
8.	Ministry of Earth Sciences	879	61.13	699	36.08
9.	Ministry of Water Resources	134	16.30	17	0.81

1.10 Departmentally Managed Government Undertakings - Position of Proforma Accounts

The General Financial Rules stipulate that departmentally managed government undertakings of commercial or quasi-commercial nature will maintain such subsidiary accounts and proforma accounts as may be prescribed by the Government in consultation with the C&AG.

There were two departmentally managed Government Undertakings of commercial or quasi-commercial nature as of 31 March 2012 which were under audit jurisdiction of this office. The financial results of these undertakings are ascertained annually by preparing proforma accounts generally consisting of Trading Account, Profit and Loss Accounts and Balance Sheet. The position of the summarised financial results of the departmentally managed government undertakings on the basis of their latest available accounts is given in **Appendix V**. Both Nuclear Fuel Complex and Heavy Water Board provided provisional figures.

1.11 Losses and irrecoverable dues written off/waived

Statement of losses and irrecoverable dues written off/waived during 2011-12 furnished by eight¹⁴ Ministries/Departments is given in **Appendix VI** to this Report. It will be seen from the Appendix that while in 32 cases involving ₹8.46 lakh the amounts were written off for 'other reasons', two cases

¹⁴ DAE, DOS, DSIR, DST, DBT, MoEF, MNRE and MoWR

involving ₹ two lakh pertained to 'ex-gratia payments' and one case of ₹24.78 lakh pertained to waiver of recovery which were written off during 2011-12.

1.12 Response of the Ministries/Departments to Draft Audit Paragraphs

On the recommendations of the Public Accounts Committee, Ministry of Finance (Department of Expenditure) issued directions to all Ministries in June 1960 to send their response to the Draft Audit Paragraphs proposed for inclusion in the Report of the C&AG within six weeks.

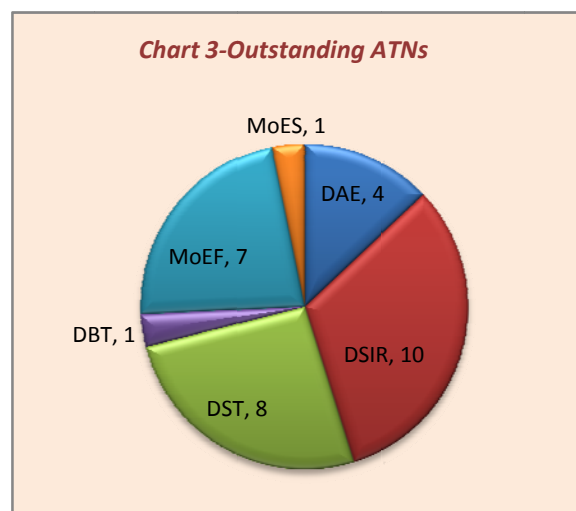
The Draft Paragraphs are forwarded to the Secretaries of the Ministry/Departments concerned drawing their attention to the audit findings and requesting them to send their response within six weeks. It is brought to their personal attention that in view of likely inclusion of such Paragraphs in the Audit reports of the C&AG, which are placed before Parliament, it would be desirable to include their comments in the matter.

Draft Paragraphs proposed for inclusion in this report were forwarded to the Secretaries concerned between November 2009 and June 2012 through letters addressed to them personally.

Concerned Ministries/Departments did not send replies to four out of 12 Paragraphs featured in Chapters II to VIII. The responses of concerned Ministries/Departments received in respect of eight paragraphs have been suitably incorporated in the Report.

1.13 Follow-up on Audit Reports

In its Ninth Report (Eleventh Lok Sabha) presented to Parliament on 22 April 1997, the Public Accounts Committee had recommended that Action Taken Notes (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. A review of outstanding ATNs on paragraphs included in the Reports of the C&AG pertaining to Scientific and Environmental Ministries/



Departments as of December 2012 (details in **Appendix VII**) revealed that a total of four ATNs pending from two Ministries/Departments/Autonomous Bodies were not received even for the first time indicating delay in submission of ATNs ranging between one year to five years.

Also revised ATNs in respect of 27 paras were pending from six Ministries/Departments for more than six months (**Appendix VII A**).

CHAPTER - II

Department of Atomic Energy

2.1 Avoidable expenditure on compensation due to breach of agreement

Nuclear Fuel Complex (NFC) entered into an agreement for procurement of a minimum quantity of magnesium granules from a private firm for a period of seven years. No clause to cover deviations in the procurement quantity was included in the agreement. In the meantime the requirement shifted to magnesium chips from magnesium granules. NFC could not revise the agreement and also failed to document the proceedings of an important meeting with the firm on the issue, resulting in avoidable payment of ₹1.43 crore towards compensation due to breach of agreement.

Nuclear Fuel Complex (NFC), Hyderabad established in 1971, is a major industrial unit of the Department of Atomic Energy (DAE) and is responsible for the supply of nuclear fuel bundles and reactor core components for all the nuclear power reactors operating in India.

During the course of its research activities NFC, between 1977 and 1982 designed, developed and qualified prototype/process for production of magnesium granules. The magnesium granules were being supplied to meet the captive requirement¹⁵ of Uranium Metal Plant (UMP) of Bhabha Atomic Research Centre (BARC)¹⁶. In view of the increased requirement¹⁷ of magnesium granules projected by UMP, NFC decided (July 1991) to transfer the technology to private parties for commercial production of magnesium granules on non-exclusive basis for a period of seven years. NFC further decided to give an undertaking to the firms for purchasing a minimum of 10 MT per annum during the seven year period of the agreement.

Accordingly NFC entered into an agreement (March 1992) with Yashoda Metals, Hyderabad (firm) for transfer of the technology and grant of license for seven years for manufacture of the magnesium granules against payment of a lump sum amount of ₹3.50 lakh as a non-refundable technology transfer fee. The agreement stipulated supply of a minimum of 10 MT of magnesium

¹⁵ 12 to 15 MT per annum

¹⁶ a constituent unit of DAE

¹⁷ 20 to 25 MT per annum

granules per year for seven years from March 1992 to March 1999 to NFC/DAE for which NFC would place purchase orders accordingly. The agreement also allowed NFC to inspect and test the product manufactured by the firm and in case it failed to meet the specifications as per the agreement, the former had the right to revoke the licence. Audit observed that NFC did not include a safety clause in the agreement to protect itself from possible deviations in the procurement of magnesium granules from the firm. Audit also found that no inspection was carried out by NFC though the firm did not install manufacturing facility as per the terms of agreement.

During 1993, BARC changed their preference from magnesium granules to magnesium chips and floated an open tender (October 1993) through its Directorate of Purchase and Stores (DPS)¹⁸ for the procurement of magnesium chips. Thereafter, the firm filed a petition against this in the Hon'ble High Court of Andhra Pradesh, as a result of which the tender notice was withdrawn and the petition was dismissed.

In March 1994 the firm requested NFC to revise the agreement for supply of magnesium granules into magnesium chips and referred to an earlier meeting held in April 1993, in which it was requested to stop the implementation of the project. The firm also claimed that it was asked during the meeting whether it could supply magnesium chips, as there was no demand for magnesium granules. NFC neither documented the minutes of the said meeting nor revised the agreement. Audit observed that although NFC was aware of the change in preference of UMP, BARC to magnesium chips, it did not take adequate measures to re-negotiate the contract and safeguard its interests.

Against the 70 MT of magnesium granules stipulated in the agreement, NFC procured only 15 MT from the firm. Due to lack of response, the firm issued a legal notice to NFC (July 2000) for loss on account of breach of contract committed by NFC. The matter was ultimately referred to the Sole Arbitrator (July 2002), who decided in favour of the firm (December 2003). NFC challenged the award before Hon'ble City Civil Court, Hyderabad but lost the case and eventually paid ₹1.43 crore to the firm (October 2010) towards full and final settlement of the above case.

Failure to protect its interest by not satisfactorily pursuing the issue with the firm nor documenting discussions of important meetings resulted in avoidable expenditure of ₹1.43 crore as compensation for breach of agreement.

¹⁸ Directorate of Purchase and Stores is a centralized agency under DAE responsible for the materials management function of the various centres and industrial units working under DAE.

In reply NFC denied (March 2012) that the Department had advised the firm to unilaterally suspend production of magnesium granules and manufacture magnesium chips. NFC further stated that the requirement of magnesium granules still existed. In the same reply, they stated that the firm never furnished any status report on production as the required unit was not installed by them.

The reply of NFC needs to be viewed in the context of its failure to document important proceedings in the execution of the agreement. They failed to carry out any inspection of the unit though as per the agreement they had right to do so. Further NFC committed to buy 10 MT per year of the magnesium granules from the firm for a period of seven years without including safety provision for possible deviations in the procurement. Also in spite of being aware that UMP, BARC had changed their preference to magnesium chips instead of granules, NFC took no action to revise the agreement or to document the meetings held with the firm on the issue. It was further seen that the average requirement of magnesium granules at UMP, BARC from 1992 up to November 2012 was 7.5 MT per annum only.

Thus failure to carry out inspection of the unit as also to record adequate precaution by NFC in the execution of the agreement resulted in avoidable expenditure towards payment of compensation of ₹1.43 crore.

The matter was referred to the Department in March 2013, its reply was not received as of July 2013.

2.2 Hasty procurement of equipment without creating infrastructure facilities for installation

Saha Institute of Nuclear Physics, Kolkata (SINP) could not install equipment of ₹38.90 crore for want of required infrastructure.

The Saha Institute of Nuclear Physics (SINP), Kolkata is an institute of basic scientific research working under Department of Atomic Energy (DAE). SINP formulated a proposal to set up a national Facility for Research in Experimental Nuclear Astrophysics (FRENA) in February 2007. The project comprised of procurement of a three MV (high current) tandem and a 500KV accelerator system along with other accessories at an estimated cost of ₹35 crore. To install these pieces of equipment, major works including construction of accelerator hall and laboratory buildings, electrical and air conditioning, liquid nitrogen plant, computers and networking, etc., were to be completed at an estimated cost of ₹24.46 crore at the institute's new campus at Rajarhat, Kolkata. The proposed facility was to provide

opportunities of research in the field of low energy nuclear astrophysics for first time in India.

In June 2007, SINP sought the approval for procurement of the equipment for the FRENA project from DAE for which DAE sanctioned ₹35 crore in March 2008. Before the memorandum conveying sanction was received, it floated (November 2007) a global tender for the equipment allowing the bidders, 35 days to respond as against 90 days as stipulated in the Purchase Manual of DAE. A single bid received from a foreign firm was opened on 7 December 2007 and supply order for two items¹⁹ was placed with the firm on 31 December 2007.

Subsequently, SINP revised supply orders twice, first in March 2008 and again in August 2008, to include remaining 24 pieces of equipment and issued to the same firm. The total value of orders was Euro 57,81,084 and delivery period was 24 to 26 months from the placement of confirmed orders. The institute placed orders for procurement of equipment without prior approval of the DAE and the concurrence of Member (Finance), Atomic Energy Commission (AEC) as required under Delegation of Financial Powers Rules. The equipment was received in December 2010 and expenditure of ₹38.90 crore had been incurred on the same.

As stated above, SINP had planned to construct the accelerator hall and laboratory building at the proposed new campus at Rajarhat and the works were scheduled to be completed by September 2009. But, it engaged a consultancy firm for the preparation of a Master Plan for its Rajarhat campus only in September 2008. In December 2009, it decided to construct the FRENA laboratory building in existing Salt Lake campus, citing procedural delays in getting the approval of the Master Plan for the Rajarhat Campus. Meanwhile the equipment was delivered in December 2010. The tenders for construction of laboratory building had not been finalised as of October 2012, despite lapse of 22 months from the date of delivery of equipment. As 22 month period was stipulated for completion of building works in prequalification tender documents and, therefore, the building infrastructure is not expected to be ready before August 2014. This indicated lack of planning coupled with delayed action for construction of infrastructure for costly equipment. Thus undue haste in placing order for equipment resulted in following:

- (a) Equipment worth ₹38.90 crore was lying uninstalled and extra expenditure of ₹15.03 lakh has been incurred since December 2010. The temporary arrangement in place for last 18 months is likely to

¹⁹ Switching magnet, Type 'A' including accessories and 90° deflection magnet including accessories.

continue at least for another 18 months, as construction of the laboratory building was yet to start (June 2012).

- (b) The project cost was revised to ₹45.24 crore to cover escalation in equipment cost, exchange rate variation and custom duty etc., the approval of DAE for the revised project cost was still awaited (June 2012).
- (c) No testing for the equipment was done and the warranty period for the equipment was over in March 2012. Rectification of any major fault, if discovered during installation in future will have additional cost implications.

SINP stated (June 2012) that Directorate of Constructions, Services and Estate Management (DCSEM) of DAE had shortlisted the interested agencies for construction of the accelerator hall and laboratory building. Tender papers for the same were being prepared and construction of the building was expected to commence later this year. SINP subsequently stated (October 2012) that AERB had given approval in September 2012 and they were in process of placing the work order for construction of the building. The fact remains that SINP showed undue haste in procurement of equipment and did not show the same level of diligence in creating supporting infrastructure which led to idling of costly equipment.

The matter was referred to DAE in June 2013; their reply was awaited as of July 2013.

CHAPTER - III

Department of Space

3.1 EDUSAT Utilisation Programme

EDUSAT, launched by the Department of Space (DOS) in September 2004 was India's first thematic satellite dedicated exclusively for educational services to provide distance education service to remote areas of India. The total investment was ₹549.09 crore comprising of direct investment of ₹282.76 crore towards the launch of the spacecraft and further expenditure of ₹266.33 crore on establishment of ground network.

It was observed in audit that EDUSAT failed to effectively achieve its objectives due to deficiencies in planning for the network connectivity, content generation and failure to have a robust management structure. There were deficiencies in actual implementation of the programme such as delay in establishment of ground network, idling of network connectivity, disparities in the allocation and idling of satellite bandwidth, inadequate content generation and deficiencies in monitoring and evaluation. The replacement strategy for the existing satellite was also deficient resulting in idling of operational networks. Thus, the objectives of implementation of EDUSAT could not be met fully even at the end of its life.

3.1.1 Introduction

3.1.1.1 Recognising the importance of education in national development and the challenges faced in the field of education on a number of fronts like the adult and continuing education, school education, higher education and professional education, it was felt that a promising technology, in particular, a satellite based system could provide an optimal solution in achieving the necessary growth and appropriate quality in education and also its reach in remote parts of the country.



Accordingly, on a proposal made by DOS /ISRO in August 2002, an exclusive Education Satellite (EDUSAT) was launched on 24 September 2004. The specific factors that formed the basis of the launch of the exclusive satellite were:

- (a) An acute shortage of qualified teachers both at school level and higher education including engineering and other technical subjects.
- (b) A massive drop out of students at school level.
- (c) A need for formal and non-formal and continuing education to the vast masses of the country through satellite, viz., EDUSAT in view of a very large population of illiterates and rural literacy.
- (d) Need to supplement curriculum based teaching, provide effective teacher training, facilitate community participation and enable interaction between scholars and research.
- (e) Need to provide a quantum jump in providing access to education to remote areas and improving the quality of education.

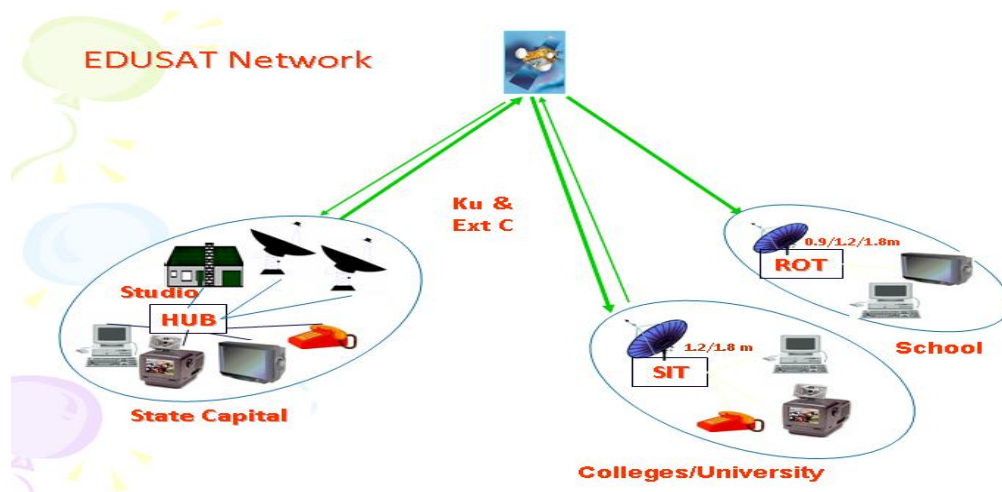
The programme to utilise EDUSAT was known as EDUSAT Utilisation Programme (EUP). EUP was to be utilised by various national and regional users. The national users were to be Indira Gandhi National Open University (IGNOU), National Council of Education Research and Training (NCERT), Integrated Disease Surveillance Programme (IDSP) and National Council of Science Museums (NCSM). The regional users were to be state governments, universities, colleges and schools.

EDUSAT had six transponders²⁰ in Ku-band and six transponders in extended C Band with a capacity of 36 MHz each. The total satellite capacity of 12 transponders of EDUSAT was therefore 432 MHz. The operational life of the satellite was seven years.

EDUSAT network was to have hub and studio facility at state capital/designated place of users, Satellite Interactive Terminals (SITs) at universities/colleges and Receive Only Terminals (ROTs) at schools. ISRO provided one hub and 10 terminals to each State/Union Territory free, the cost of establishing rest of the hubs and terminals was to be borne by the respective States/Union Territories. Educational programmes were to be aired from the studio facility. While SITs are two way audio and video communication,

²⁰ Transponders perform the task of being both transmitters and responders. It is an electronic device used in satellite which receives a particular signal from a source, it strengthens signal before sending it to a predefined location. Each transponder will have bandwidth of tens of megahertz.

enabling interaction of student and teacher for engineering colleges, teachers training institutions, etc., ROTs are one way audio and video delivery terminals for primary and secondary education, as shown in the diagram below:-



There was one national beam and five regional beams provided by ISRO through EDUSAT to cater to the educational requirements of the nation as a whole and also of the regions separately. As of September 2011, there were 47 hubs available in EUP. One hub was capable of supporting eight networks. Each of these networks could support a maximum of 500 SITs primarily for universities/colleges and any number of ROTs primarily for schools. Therefore, EUP had capacity to support 376 networks and in turn 1.88 lakh SITs and any number of ROTs.

ISRO decommissioned EDUSAT on 30 September 2010 at the end of sixth year of its operation due to power constraints in the satellite.

3.1.1.2 A Chronology of important events of EUP

August 2002	Meeting of the Secretary, DOS and representative of DOS/ISRO with Minister of Human Resources Development and its officials on the idea of launching an exclusive satellite for Education
August 2002	Space Commission approved development of an exclusive satellite for education at a cost of ₹85 crore.
May 2003	Space Commission approved EDUSAT Utilisation Programme for ₹98 crore.
August 2004	News Letter of ISRO on EDUSAT stated that regional hubs would be operational within six months from the date of launch of EDUSAT i.e., by March 2005
September 2004	National Core Group (NCG) was constituted to look after the management issues on a long term basis.

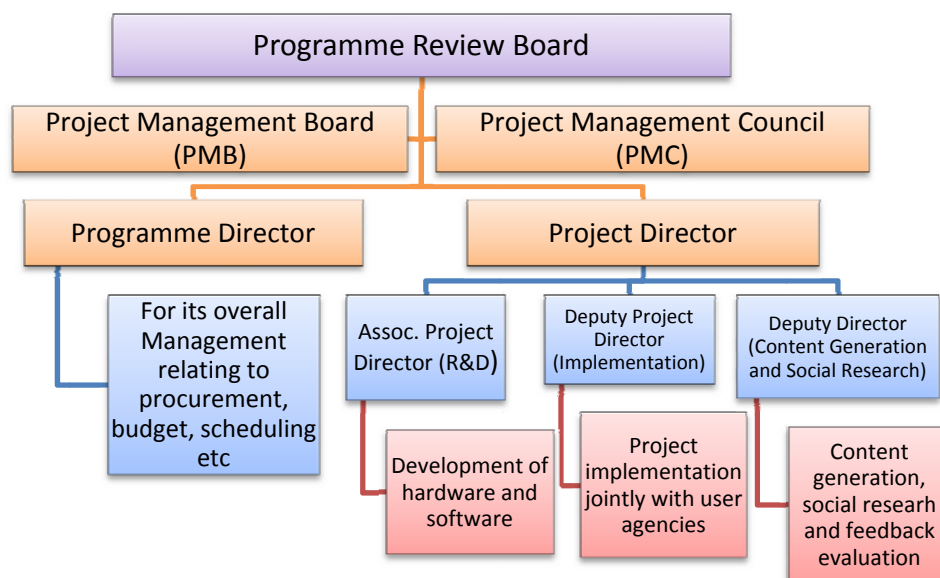
September 2004	Inter Departmental Programme Review Board (PRB) and DOS/ISRO level Project Management Board (PMB) and Project Management Council (PMC) was constituted considering the large scope of work, complexities involved and keeping in mind the follow up/coordination and user interfaces required for EDUSAT utilisation.
September 2004	EDUSAT was launched using GSLV-F01.
September 2004	National Institute of Advanced Studies (NIAS) conducted an impact assessment study on the pilot phase of EUP for 13 weeks.
October 2004	Meeting of NCG in Delhi in which it was decided that one hub would support eight to 10 sub-hubs (EDUSAT networks).
November 2004	First meeting of PMB.
December 2004	Meeting of NCG in which it was decided that funding at Central and State level was very critical and the possibility of a Centrally Sponsored Scheme (CSS) to be explored. User agencies were directed to keep enabling provision in their budget for EDUSAT activities. The possibility of commercial renting out of the satellite to ensure commercial viability was also discussed.
January 2005	PMC meeting.
April 2005	Second meeting of PMB. It was decided that each state will have minimum one hub with a bandwidth of around 4.5 MHz with three simultaneous channels and 1200 SITs.
June 2005	First meeting of PRB
August 2005	Meeting of NCG
April 2006	A proposal to fund EUP on CSS mode was initiated by Ministry of Human Resources Development
September 2008	10 networks of EDUSAT were shifted to another satellite due to power constraints in the EDUSAT
June 2009	Another seven networks of EDUSAT shifted to other satellite
August 2009	ISRO stated that licensing scheme built into the hubs is that hubs can support a maximum of 500 interactive terminals and any number of receive only terminals
May 2010	13 networks of EDUSAT were shifted to other satellites
September 2010	EDUSAT was decommissioned in its sixth year of operation due to power constraints in the satellite

3.1.1.3 The main objectives of EUP were:

- To provide support to education through low cost ground segment and reach the unreached people of India in every nook and corner;
- To provide sustainable distance education service and support formal and non-formal education in India.

3.1.1.4 At the national level, a Core Group was formed which comprised of Vice Chancellor, IGNOU as the Chairman, representatives from ISRO, University Grants Commission (UGC) and National University of Educational Planning and Administration (NUEPA). The Core Group was constituted in September 2004 to finalise the programme schedule of EDUSAT and to look after management issues relating to EDUSAT on a long term basis.

In addition to the above, EDUSAT utilisation Project Management Board (PMB), Project Management Council (PMC) and Programme Review Board (PRB) were also constituted for direction, guidance and overall management of EDUSAT. An organisation chart of EUP is detailed below:-



3.1.1.5 DOS spent ₹282.76 crore on EDUSAT and its launch and ₹266.33 crore²¹ on establishment of ground network as of March 2013.

3.1.1.6 Audit test checked the implementation of EUP during May 2009, January – March 2011, October 2011 and June - July 2013 covering the period up to March 2013. Out of 83 networks established in 48 hubs of 35 States/UTs, 47 networks established in 30 hubs in 14 States/Union Territories were selected for detailed study. Similarly, out of more than 80 purchase orders issued to various contractors for the installation and commissioning of networks, 19 purchase orders consisting of 24 hubs and 15,123 terminals (1,990 SITs and 13,133 ROTs) were selected for detailed scrutiny. Important issues relating to deficiencies in planning, execution and decommissioning of EDUSAT are discussed in the succeeding paragraphs.

²¹ Includes ₹180.79 crore shared by various States/institutions.

3.1.2 Issues in planning of the EUP

3.1.2.1 Failure to obtain the revised financial sanction for EUP from the appropriate authority

According to the instructions issued by the Ministry of Finance in May 2003, approval of the Union Cabinet is necessary for undertaking projects estimated to cost more than ₹100 crore. Therefore, DOS was to obtain the approval of the Union Cabinet for incurring expenditure above ₹100 crore under EUP.

Actual expenditure incurred on establishment of ground network of EUP was ₹266.33 crore. DOS however had obtained the approval of the Space Commission for incurring expenditure of ₹98 crore only. The financial sanction for the escalation in project cost was not obtained from the appropriate sanctioning authority as was being done by DOS in other projects such as Space Capsule Recovery Experiment (SRE) II project.

ISRO stated (August 2009) that Space Commission had approved the programme and added that the EDUSAT programme was an approved budget item of ISRO every year. DOS stated (February 2010) that annual budget proposals containing projections of expenditure for EUP of the DOS had been voted by the Parliament thereby providing authorisation for incurring the expenditure. Approval of the Union Cabinet was mandatory since actual expenditure under the project was ₹266.33 crore.

3.1.2.2 Non-fixation of target date and action plan for the establishment of ground network

The connectivity between hubs and the ground networks comprising of interactive terminals and receive only terminals were to be realised in three phases. These were pilot phase, semi-operational phase and operational phase. In the pilot phase, INSAT 3A/3B satellites were used to ensure that the technology worked with satellite based solution. In the semi-operational phase, EDUSAT was used to establish national and regional networks. In the operational phase, the users were to procure ground segment with technical support from ISRO and the network was to become fully operational. A time bound schedule and action plan in terms of number of ground networks to be established under each phase needs to be fixed to ensure timely establishment of ground networks.

It was observed in audit that specific target dates were not fixed for each of these phases. A time bound programme schedule with action plan and details regarding establishment of networks, hubs, SITs, ROTs, etc., were not

fixed. A definite programme indicating targets, action plans for each year of operation, milestones, etc., was also not in place. Thus, non-fixation of definite target dates and non-preparation of action plan for the three phases of EUP delayed the implementation of the project. Further, there was no documentation to show the completion of each phase (pilot phase, semi-operational phase and operational phase) of the project.

ISRO while admitting the audit observation stated (August 2009) that while broad objectives and action plans were made by ISRO, the exact numbers were not taken as targets as there were uncertainties with respect to end users' participation, preparedness, budget allocation, etc. The reply of ISRO/DOS pointed out to the lack of definite plans. Thus, DOS did not ensure end user participation, user preparedness and financial resources prior to launch of EDUSAT and rolling out of EUP.

3.1.2.3 Inadequate plan of action for running educational programmes

The educational programmes prepared by content experts needs to be aired from the studio facility associated with hub. The contents so generated were to be run through the EDUSAT ground network. Therefore content generation constituted a vital component of EUP. The educational programmes to be generated had to be in different languages, accurate, authentic and credible besides being consistent with the prescribed syllabus. Through an order issued in September 2004, ISRO took upon themselves the responsibility of content generation jointly with user agencies.

Audit observed that there was no definite plan of action for content generation/utilisation in ISRO and there was no single source identified for co-ordination and monitoring.

ISRO stated (August 2009) that while implementing the EDUSAT programme, all stakeholders had agreed that the content generation should be the responsibility of user agencies like State Governments/Departments/Universities. It added that ISRO through its unit viz., DECU²² took significant steps to guide the users by publishing a guideline book on content generation. DOS stated (February 2010) that state level registered societies were established for looking after content generation. However, ISRO failed to discharge its proactive role and coordinate content generation effectively. The assessment mechanism for the reach of educational services to the targeted people by ISRO was also not on record.

²² Development and Educational Communication Unit

3.1.2.4 Ineffective monitoring and evaluation mechanism

In view of the large number of agencies involved in the implementation of EUP, it was essential to have a robust structure in place to co-ordinate and monitor implementation. EUP envisaged the following monitoring and evaluation mechanism.

- A coordinating body involving Ministry of Human Resources Development (MHRD), state governments, user agencies like UGC, DST²³, AICTE²⁴ etc., and ISRO.
- Constitution of various agencies like an independent education authority/EDUSAT co-ordination committee/EDUSAT Advisory Group etc., at various stages of implementation of EUP.
- ISRO as a technology provider and partner was responsible for content generation, social research feedback and evaluation, pilot programme production and research studies as well as utilisation jointly with user agencies and MHRD. Users were required to ensure continuous content/educational programmes to these networks and also to ensure the safe custody of these ground networks. Therefore, tripartite MOUs were required to be entered into by ISRO with MHRD and concerned State/national users, defining the specific responsibilities of each entity.

Audit observed that against the above monitoring and evaluation mechanism envisaged, DOS/ISRO did not put these mechanisms in place as discussed below:-

- The coordinating body was not created to ensure full utilisation of the services provided by EDUSAT. Non-creation of a body to coordinate between different stakeholders delayed actual implementation of EUP. DOS stated (February 2010) that a high level inter-departmental Programme Review Board was constituted for smooth co-ordination and optimal utilisation of EDUSAT network. The reply is not acceptable, since a Programme Review Board which is an inter-departmental board, consisting of members of ISRO/DOS and various central agencies/universities did not have representatives from user states and as such, effective coordination was not possible. Further, the National Core Group and Programme Review Board comprising of the representatives of MHRD, however, did not meet after August 2005.

²³ Department of Science and Technology.

²⁴ All India Council for Technical Education.

- Education authority/EDUSAT co-ordination committee/EDUSAT Advisory Group was not constituted as envisaged. Without furnishing specific reasons for non-constitution of management structure as envisaged, ISRO stated (August 2009) that all possible efforts within the powers of DOS/ISRO had been made to effectively utilise EDUSAT as a technology provider and partner. Further, without furnishing the details of reporting structure, ISRO stated that it was being streamlined.
- A tripartite MOU as envisaged was not entered into. ISRO noted the observation in August 2009 and DOS stated (February 2010) that MHRD took the responsibility of getting MOU signed by user agency in September 2005. Without furnishing signed copy of the tripartite MOU, DOS merely added that tripartite MOU method already existed.

3.1.2.5 Financial resources for EUP

In a high level meeting under the Chairmanship of Secretary of the Department of Secondary and Higher Education, Government of India in December 2004, it was deliberated that the funding of the project at the Central and State level is very critical for the success of the programme and possibility of a Centrally Sponsored Scheme (CSS) was to be explored.

Though the idea of a CSS to fund EUP was mooted in November 2003, MHRD initiated the proposal only in April 2006 to utilise EDUSAT fully. CSS proposed an investment of ₹2,456 crore to utilise EDUSAT fully, including ₹1,628.03 crore towards ground network connectivity and ₹590 crore towards content generation. The scheme did not materialise and in the meantime, EDUSAT was decommissioned. DOS stated (February 2010) that MHRD funding was part of country wide funding of EUP and this funding was out of context with respect to EDUSAT.

The reply of DOS needs to be viewed in light of the fact that EDUSAT had remained grossly underutilised and the modalities to ensure full utilisation of EDUSAT including funding for the programmes should have been worked out by DOS before launch of the satellite. However, even at the end of its life (at the end of sixth year of its operation), action plan for full utilisation of EDUSAT was not in place.

It was, therefore, evident that a definite source of funding was not identified for the users towards expansion of their network connectivity and content generation even at the end of the life of EDUSAT (September 2010). Inadequate planning of financial resources therefore resulted in underutilisation of the satellite.

Recommendation 1:

DOS/ISRO need to plan their satellite based application programmes only after ensuring that definite plans in terms of finances and infrastructure are in place so that the satellites are utilised fully.

3.1.3 Issues in execution of EUP

3.1.3.1 Establishment of network connectivity

(a) Delay in establishment of ground networks

A total expenditure of ₹549.09 crore was incurred towards EDUSAT and EUP as on March 2013. EDUSAT was launched in September 2004 and was to remain in operation for seven years i.e., up to September 2011. Therefore timely utilisation of satellites by establishing network would ensure effective utilisation of scarce satellite resources.

The regional EDUSAT networks were expected to be operational in six months after the launch of EDUSAT (i.e. by March 2005). The test check of records relating to establishment of network in 14 states revealed that there were delays in the establishment of EDUSAT. The delay has been worked out from the scheduled date of operationalisation of the network to actual date of operationalisation of the network. The delays in the test checked cases were as under:-

Table 5- Delay in establishment of selected networks

Sl. No.	Networks	Scheduled date of Operationalisation ²⁵	Actual date of operationalisation *	Delay in months
1.	Odisha	March 2005	January 2009	46
2.	Maharashtra (YCMOU Nasik Hub)	March 2005	August 2008	41
3.	Arunachal Pradesh	March 2005	May 2008	38
4.	Punjab	March 2005	January 2008	34
5.	Madhya Pradesh (RSK)	March 2005	September 2007	30
6.	Haryana	March 2005	May 2007	26
7.	Integrated Disease Surveillance Programme	April 2007	March 2011**	48
8.	Rajasthan	March 2005	October 2006	19

²⁵ The national beams of EDUSAT were operational from November 2004 and its five regional beams were operationalised six months from its launch viz., March 2005. Actual date of operationalisation of the networks was requested for computing the delay, which was not furnished. Thus, from the information available in the network file, actual date of operationalisation of the 14 networks test checked in audit were arrived at.

9.	West Bengal	March 2005	Training for the site coordinators completed by July 2006	16
10.	Jammu & Kashmir (Srinagar Hub)	March 2005	Srinagar hub was inaugurated in May 2006	14
11.	Karnataka (Interactive)	March 2005	March 2006	12
12.	Delhi	March 2005	March 2006	12
13.	Tamil Nadu	March 2005	October 2005	7
14.	Kerala	March 2005	October 2005	7

* After supply, installation, testing, commissioning and operationalisation and imparting of training
**37 SITs are yet to be installed.

- The delays in the establishment of networks ranged from seven months to 46 months in these 14 states indicating idling of satellite resources during the operational life of the satellite.
- In 50 *per cent* of the cases there was a delay of more than one year but less than two years.
- In 29 *per cent* of the cases there had been delay of more than two years.

DOS stated (February 2010) that delay was due to significant delays in arranging road permits by the user agencies and site readiness for the installation of the equipment. The reply of DOS needs to be viewed in light of the fact that the management structure to address these issues though envisaged was not put in place. It was also evident that the delay was due to absence of definite target dates and implementation plan for various phases of the project together with lack of funds with user states.

(b) Delay in the establishment of network due to deficiency in the management of network contracts

DOS/ISRO established the network in the user states by releasing purchase orders to the firms such as Bharat Electronics Limited, Hughes Network Systems India Limited, etc.

Test check of 19 out of 84 orders issued by ISRO till March 2009 for installation and commissioning of hubs and terminals revealed delays in completion by one to 35 months. DOS in February 2010 cited reasons such as delay in obtaining road permit, site readiness and holidays at schools for the delay in installation and commissioning. In these 19 cases test checked, liquidated damages of ₹17.39 crore leviable on contractors for delays in completion could not be levied as States/UTs delayed readying the sites of installation.

ISRO stated (August 2009) that a suitable clause to recover the charges on account of non-readiness of site from the user States/UTs was being incorporated in the MOUs entered subsequently with users. It added that it might not be feasible to implement this in the old MOUs at this stage. The fact remains that liquidated damages were not/could not be levied for delays in installation and commissioning.

(c) Underutilisation of EDUSAT in terms of network connectivity

DOS/ISRO incurred substantial sums towards EDUSAT and its utilisation programme. Further, the operational life of the satellite is limited and valid for seven years. The scarce satellite resource, therefore, needs to be utilised to its maximum potential to achieve the intended objective of EUP to ensure that satellite based education reach the unreached poor people of India.

Audit, however, observed that there was underutilisation of EDUSAT, both in terms of network connectivity and in terms of satellite resource utilisation as discussed below:

- As per the norm one hub supports eight networks. Therefore 47 hubs that were available in EUP as of September 2011 should have supported 376 networks. As against this, EDUSAT supported only four networks in 2004-05, 12 in 2005-06, 31 in 2006-07, 46 in 2007-08, 51 in 2008-09, 52 in 2009-10 and 42 networks in its final year of 2010-11 as detailed in the table below:

Table 6- Status of the establishment of EDUSAT Networks from 2004-05 to 2010-11 (September 2010)

No.	Year	Networks	Percentage of Networks not established against a maximum of 376 networks a year possible [$100 - (\text{col.3} \times 100 / 376)$]	Percentage of Networks not established against a maximum of 136 networks a year possible [$100 - (\text{col.3} \times 100 / 136)$]
1.	2004-05 (EDUSAT was launched in September 2004)	4	99	97.06
2.	2005-06	12	97	91.18
3.	2006-07	31	92	77.21
4.	2007-08	46	88	66.18
5.	2008-09	51	86	62.50
6.	2009-10	52	86	61.77
7.	2010-11 (EDUSAT was decommissioned in September 2010)	42	89	69.11
	Average	34	91	75

- As would be seen from the table above, the under utilisation, when compared to the maximum capacity of 376 networks round the year, varied from 99 *per cent*²⁶ in 2004-05 to 89 *per cent*²⁷ in 2010-11 with an average of 91 *per cent*²⁸ over the period. This resulted in idling of satellite capacity, which impacted availability of educational programmes to the intended target groups.

ISRO stated (September 2009) that considering the transponder availability at the end of the life of the space craft, maximum number of networks EDUSAT can support was only 136. DOS stated (February 2010) that EDUSAT supported 96 networks (70 *per cent*) as of February 2010, in the fifth year of operation and all hubs were to be customised to the user requirements and every hub would not be capable of supporting eight networks. The replies of ISRO and DOS need to be viewed in the context of the fact that the action plan prepared by ISRO clearly stipulated that each regional network could handle maximum eight networks. Further, even after accepting the contention of ISRO, EDUSAT could support only up to a maximum of 52 networks during its operational life which was only 38 *per cent*²⁹ of the capacity.

- Going by the contention of DOS that EDUSAT could only support 136 networks, there was still an underutilisation of EDUSAT to the extent³⁰ of 69 *per cent* at the end of September 2010. Thus the objective of reaching satellite based education to the un-reached poor masses remained unachieved to a large extent despite incurring huge expenditure for the purpose.
- Against the capability of each network to support 500 SITs, none of the 61 networks³¹ of EUP established as of March 2009 supported its maximum capacity. Similarly, against the capability of each network supporting any number of ROTs, only 18 networks (30 *per cent*) supported ROTs. This resulted in under utilisation of network and entailed inadequate reach of educational programmes. Without indicating network capability of each hub established under EUP, DOS stated (February 2010) that technically it was incorrect to derive the utilisation factor from the capabilities of the hub. The reply of DOS is contrary to earlier replies of August 2009 furnished by ISRO that the

²⁶ Considering eight network per hub $[100 - (4 \times 100 / 376)]$.

²⁷ Considering eight network per hub $[100 - (42 \times 100 / 376)]$.

²⁸ Average of 4, 12, 31, 46, 51, 52 and 46 is 35 $[100 - (35 \times 100 / 376)]$

²⁹ $52 \times 100 / 136$

³⁰ $[100 - (42 \times 100 / 136)]$

³¹ 52 networks of EDUSAT and nine networks shifted to INSAT 4CR satellite

licensing scheme built into the hubs supported a maximum of 500 SITs and any number of ROTs. States could not exploit the hub capacity. Some of the networks did not have ROTs as the State Governments had not allocated sufficient funds to start the network which confirm ineffective coordination with states in pre-launch phases.

- Audit also observed from the Bandwidth Utilisation Statement of March 2009 furnished by ISRO that a separate bandwidth of 2.3 MHz was allocated to Bhabha Atomic Research Centre (BARC) hub without a regular network resulting in idling of hubs. Thus, the bandwidth allocated to this hub was not utilised. Without indicating number of SITs and ROTs connected to BARC, DOS stated (February 2010) that it was a fully functional network for CBSE schools. The reply of DOS was not acceptable in view of the fact that the status of the EDUSAT Network furnished by ISRO in May 2009 revealed that network consisting of SITs and ROTs was not established for this hub.

Though the success of EUP depended on network connectivity, this could not be ensured by ISRO. Thus, there were inordinate delays ranging from seven months to almost four years in establishment of networks, resulting in under utilisation of satellite in terms of network connectivity averaging to 90 *per cent* during the life of the satellite. There were losses due to non-utilisation of network connectivity, establishment of network connectivity when optimal terminals were not available and inadequate penetration of ROTs at the primary school level. Similarly, there were instances of underutilisation of hubs and network connectivity due to non-establishment of adequate terminals. As a result, reach of the educational programmes beamed by EDUSAT could not reach all the user agencies, specially the states.

DOS stated (February 2010) that a co-ordination mechanism from DOS/ISRO was identified in September 2004 and that the response from the user agency was lacking which led to delay in establishing the network. It added that funding from the State Governments was needed to increase the population of terminals. The reply is to be viewed in the context that a management structure was not constituted and a mechanism to fund network connectivity and content generation though envisaged was not put into practice for the successful implementation of EUP. Lack of coordination with user agencies for timely action regarding site preparedness and arrangement for establishing network was evident.

(d) Satellite capacity allocation and utilisation in state networks

The transponder capacity/bandwidth of various Indian satellites is a national resource and should be allotted judiciously and in a most transparent manner to derive maximum benefit. Bandwidth is the space to enable users to utilise EUP and is expressed in megahertz (MHz). Higher the bandwidth more could be the networks, channels, programmes etc. EDUSAT had six transponders in Ku-band and six transponders in extended C Band each with a capacity of 36 MHz. Thus, a total bandwidth of 432 MHz was available for allocation. The allocation of bandwidth was to take into account the target groups. Of the twelve transponders, seven (six C band and one Ku band) were for National beams and five (Ku band) were for regional beams for imparting education in regional languages. PMB of EUP decided in April 2005 that each state would have a minimum one hub with a bandwidth of around 4.5 MHz, with three simultaneous channels and 1,200 SITs. Details of bandwidth allocation, target groups and connectivity in various states³² are as follows:

Table 7- Status of state-wise allocation of Satellite Capacity at the end of March 2009

No.	States	Satellite capacity Allocation	Population – Target groups (Figures in lakhs)				Connectivity		
			Total	Rural	Child	Illiterates	Network	SITs	ROTs
1.	Andhra Pradesh	1.50	762.10	554.01	101.72	362.76	1	0	2,100
2.	A&N Islands ³³		3.56	2.40	0.45	1.03	1	25	0
3.	Arunachal Pradesh	3.40	10.98	8.70	2.06	6.13	1	47	0
4.	Assam	3.40	266.55	232.16	44.98	126.40	0	0	0
5.	Bihar	0.00	829.98	743.17	168.05	518.89	0	0	0
6.	Chandigarh	0.00	9.00	0.92	1.16	2.57	0	0	0
7.	Chattisgarh	2.25	208.33	166.48	35.55	96.61	1	47	0
8.	Dadra & Nagar Haveli	0.00	2.20	1.70	0.40	1.17	0	0	0
9.	Daman & Diu	0.00	1.58	1.00	0.21	0.51	0	0	0
10.	New Delhi ³⁴	27.87	138.50	9.45	20.17	41.86	1	32	0
11.	Goa	3.00	13.47	6.77	1.46	3.62	0	0	0
12.	Gujarat	12.30	506.71	317.41	75.32	208.43	2	0	1,210
13.	Haryana	10.00	211.44	150.29	33.36	90.51	5	509	10,032
14.	Himachal Pradesh	0.00	60.77	54.82	7.93	20.36	0	0	0
15.	Jammu & Kashmir	8.64	101.43	76.27	14.86	53.36	2	100	0
16.	Jharkhand	0.00	269.45	209.52	49.57	151.68	0	0	0
17.	Karnataka	19.61	528.50	348.89	71.82	224.16	6	59	3093

³² Source: EDUSAT Bandwidth Allocation Statement as of March 2009 furnished by ISRO (this statement did not include the bandwidth allocated to states such as Andhra Pradesh, Lakshadweep and Odisha), 2001 Census data of states.

³³ Supported from INSAT-4A.

³⁴ Band width allocation to National beam such as IGNOU, NCERT and Mahabharat included.

Table 7- Status of state-wise allocation of Satellite Capacity at the end of March 2009

No.	States	Satellite capacity Allocation	Population – Target groups (Figures in lakhs)				Connectivity		
			Total	Rural	Child	Illiterates	Network	SITs	ROTs
18.	Kerala ³⁵	5.76	318.41	235.74	37.93	63.56	5	100	1,400
19.	Lakshadweep ³⁶		0.60	0.34	0.09	0.16	1	13	21
20.	Madhya Pradesh ³⁷	13.91	603.48	443.81	107.82	287.56	6	220	1,084
21.	Maharashtra ³⁸	11.09	968.78	557.78	136.70	329.13	1	41	0
22.	Manipur	3.40	22.93	15.91	3.09	8.56	0	0	0
23.	Meghalaya	3.40	23.18	18.65	4.68	11.61	1	51	0
24.	Mizoram	3.40	8.88	4.48	1.44	2.27	1	16	0
25.	Nagaland	3.60	19.90	16.47	2.90	8.58	1	43	0
26.	Odisha	6.60	368.04	312.87	53.59	169.68	2	60	80
27.	Puducherry ³⁹	0.00	9.74	3.26	1.17	2.78	0	0	0
28.	Punjab	9.16	243.58	160.97	31.72	96.02	2	307	0
29.	Rajasthan	9.00	565.07	432.93	106.51	288.05	2	82	300
30.	Sikkim	3.40	5.40	4.81	0.78	2.23	0	0	0
31.	Tamil Nadu	8.25	624.05	349.22	72.35	218.81	4	493	0
32.	Tripura	3.60	31.99	26.54	4.37	11.77	1	50	0
33.	Uttar Pradesh	0.00	1,661.97	1,316.58	316.25	904.77	0	0	0
34.	Uttarakhand	0.00	84.89	63.10	13.60	33.84	0	0	0
35.	West Bengal ⁴⁰	10.64	801.76	577.49	114.14	329.80	3	126	680
	Total	187.18	10,287.20	7,424.91	1,638.20	4,679.23		2421	20,000

The position emerging from the table and the response of ISRO on them are brought out and discussed below:

(e) Underutilisation of EDUSAT satellite capacity for education

As against the available satellite capacity of 432 MHz only 187 MHz (43 per cent) was allocated to EDUSAT user agencies. Audit further noticed from EDUSAT Bandwidth Utilisation Statement of March 2009 that 27 per cent of the available bandwidth was utilised for other purposes like private TV Channels (1.5 per cent), telemedicine (8.9 per cent), disaster management (8.3 per cent) and village resource centre programmes (8.3 per cent). 30 per cent of the satellite capacity was not utilised at all.

57 per cent of the satellite capacity of EDUSAT was idling during the fifth year of its operation, which stopped working in its sixth year of operation. Thus,

³⁵ Include IIM, Bangalore network with two SITs.

³⁶ Coupled with Kerala.

³⁷ Included Rajiv Gandhi Project for EDUSAT Supported Elementary Education (RGPEEE) Sidhi network supporting 1,084 ROTs(Receiving Terminals) .

³⁸ Include Yashwantrao Chavan Maharashtra Open University (YCMOU) with 41 SITs.

³⁹ Coupled with Tamil Nadu.

⁴⁰ Include National Council of Science Museums with six SITs.

during the entire life of the satellite, the scarce and valuable satellite capacity was idling and could not be put to use for the purpose of reaching quality education to the poor rural masses.

ISRO stated (August 2009) that transponders' usages for telemedicine programme, disaster management support programme and village resource centre programme were integral part of education in various fields of learning and hence they cannot be treated in isolation. The fact is that EDUSAT satellite which was launched exclusively for education was utilised for the purposes other than its intended use. Further a major chunk of the satellite capacity remained idle defeating the primary objectives of EDUSAT.

(f) Disparity in allotment of satellite capacity among states

The valuable and scarce satellite resources needs to be allocated to individual states uniformly keeping in view the target group of each state. The target group in the states is illiterate population, child population and rural population. Audit observed the disparities in allotment of satellite capacity as of the fifth year of the operation (satellite was in operation for six years) of EDUSAT as indicated below:

- In 22 out of 35 States/UTs constituting 63 *per cent*, the allocation of bandwidth was less than the decided average of 4.5 MHz. In 10 out of 35 States/UTs, the bandwidth allocation was more than the maximum of 6.5 MHz envisaged. DOS stated (February 2010) that there was no decided average. The reply is contrary to the decision made in the second meeting of EDUSAT Utilisation PMB held in April 2005 that each state would have a minimum one hub with a bandwidth of around 4.5 MHz.
- The states of Uttar Pradesh, Bihar, Jharkhand, Uttarakhand and Himachal Pradesh were not provided any bandwidth as of March 2009, despite the target groups (child population) in these states constituting a large chunk (33.90 *per cent*) of the total population. ISRO stated (August 2009) that continuous efforts were being made to implement EDUSAT network in Uttar Pradesh and Bihar. It also stated that Jharkhand and Uttarakhand had established networks. EDUSAT Network was yet to be established in Uttar Pradesh (June 2013) which was having illiterate population of nine crore, the largest among all the states.
- The states like Punjab (Illiterate population: 96 lakh) and Haryana (Illiterate population: 90 lakh) were allotted higher bandwidth than states having more illiterate population like Assam (Illiterate

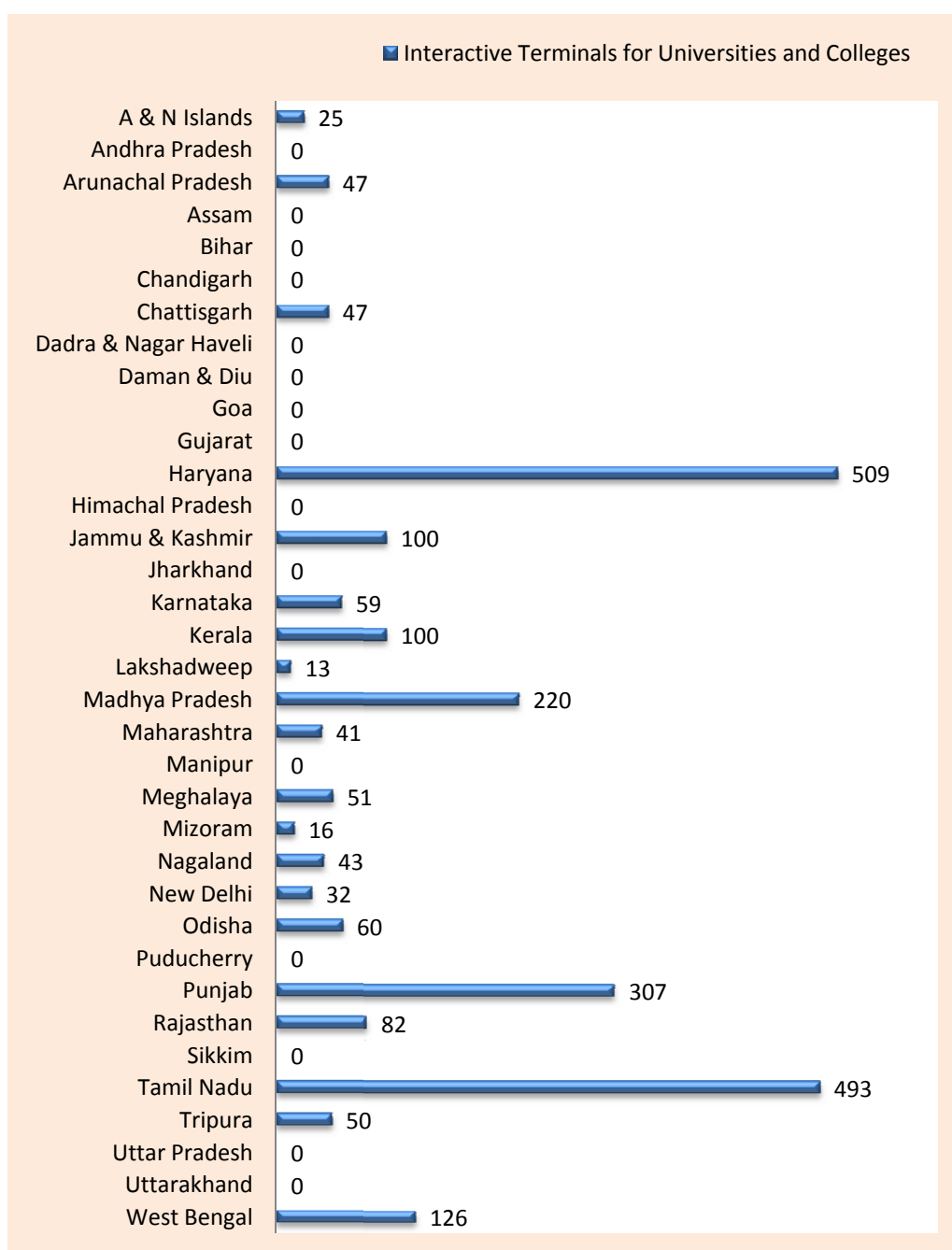
population: 126 lakh) and Odisha (Illiterate population: 170 lakh). ISRO, while admitting the fact that bandwidth allocation was not uniform, stated (August 2009) that with appropriate approvals, best performing users were provided with additional channels keeping in view effective utilisation of bandwidth on EDUSAT. DOS stated (February 2010) that states with enhanced funding were given additional bandwidth so that such states can become role model for others to follow. The reply goes against DOS/ISRO policy of providing fixed bandwidth to each state and allotment based on target groups.

- Despite terminals to utilise bandwidth not being in place, in four states (Assam, Goa, Manipur and Sikkim) total bandwidth of 13.20 MHz was allotted, resulting in idling of bandwidth. DOS stated (February 2010) that bandwidth was reserved for Uttar Pradesh and Himachal Pradesh in extended C-Band and ISRO stated (August 2009) that it was necessary to reserve minimum bandwidth for each state so that bandwidth was allotted in equitable manner for all the states to start off their programmes. Thus, non-establishment of ground network had resulted in idling of satellite capacity reserved for the states. According to its bandwidth utilisation statement of March 2009, ISRO, however, did not reserve bandwidth for states such as Uttar Pradesh, Bihar, Jharkhand, Uttarakhand and Himachal Pradesh.

(g) Failure to establish educational terminals for colleges and universities

The satellite capacity allocated to each state was to be used to its maximum potential by establishing interactive and receive only terminals. Interactive terminals are established in colleges and universities to promote quality education in higher, technical and professional education sector. To achieve this objective, EDUSAT Utilisation PMB in its second meeting (April 2005) decided that each state would have a minimum one hub with a bandwidth of around 4.5 MHz, with three simultaneous channels and 1,200 SITs. The graphical representation of the establishment of interactive terminals in the States is given in chart 4.

Chart 4- Satellite Interactive Terminals for Universities



Audit observed the following disparities as of the fifth year of operation of EDUSAT (satellite was in operation for six years) in the establishment of interactive terminals against the envisaged number of SITs for colleges and universities:

- None of the 35 States/Union Territories had achieved envisaged level of 1,200 interactive terminals. None of the 12 States/Union Territories which were allocated bandwidth of more than 4.5 MHz, had achieved envisaged level of 1,200 interactive terminals. ISRO stated (August 2009) that target of 1,200 SITs in each state was not

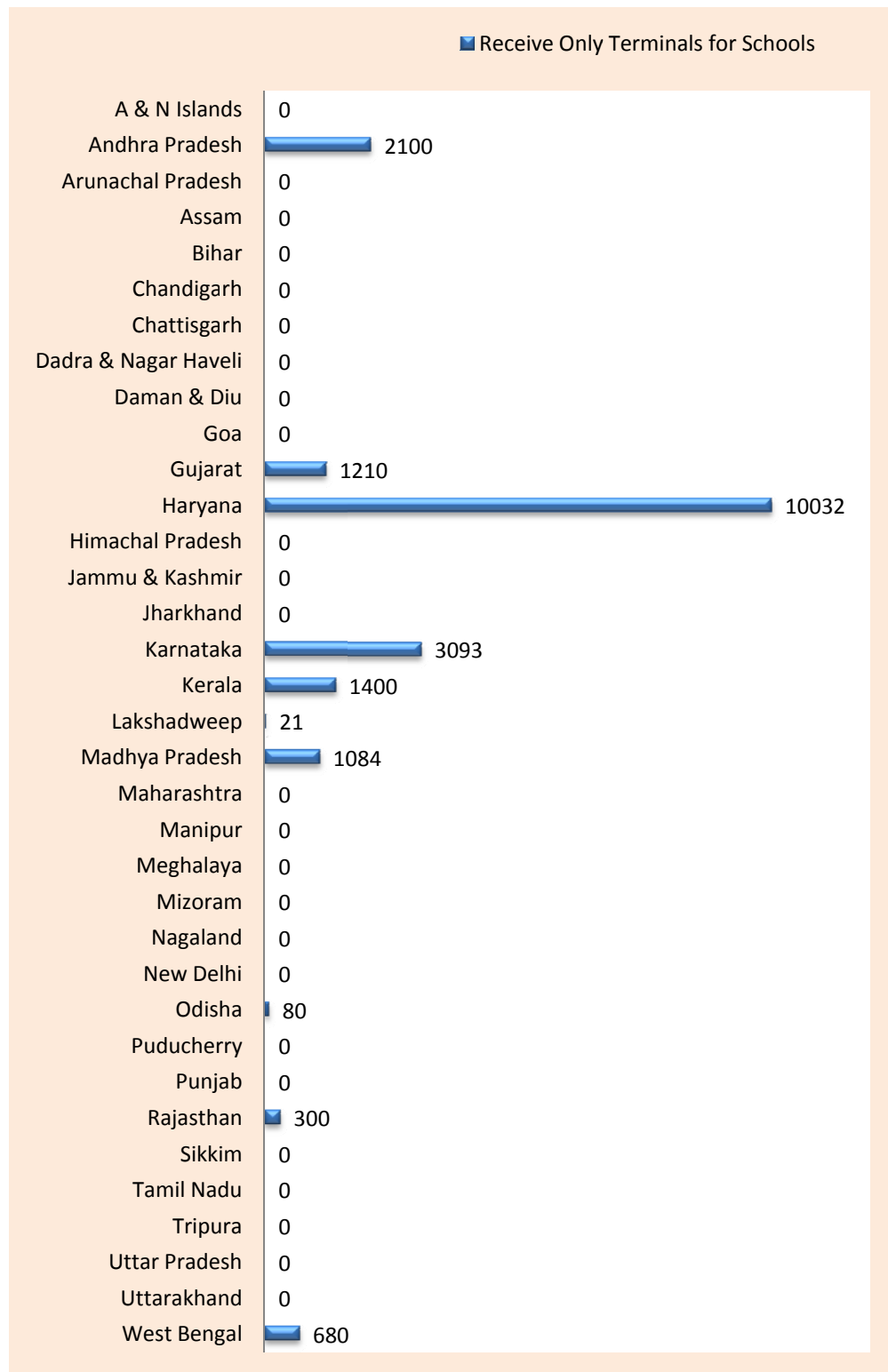
stated in any of the project plans and DOS stated (February 2010) that 1,200 SITs were not taken as a target. The fact, however, remained that in the second meeting of EDUSAT Utilisation PMB held in April 2005, it was decided that each state would have a minimum one hub with a bandwidth of around 4.5 MHz, with three simultaneous channels and 1,200 SITs.

- In 13 states neither networks nor interactive terminals were established.

(h) Failure to establish educational terminals for schools

EUP was conceived as a sustainable distance education alternative primarily for the primary school and mass non-formal education for areas where experienced teachers were not available. Receive Only Terminals (ROTs) were basically used to provide primary school education to masses. It was envisaged in the EDUSAT Action Plan that each network can have unlimited number of ROTs. The graphical representation of the establishment of receive only terminals in the States is given in chart 5.

Chart 5- Receive Only Terminals for Schools



Audit observed the following disparities as of the fifth year of operation of EDUSAT (satellite was in operation for six years) in the establishment of receive only terminals for schools:

- From the status of ROTs established, it is evident that out of 30 States/UTs where EDUSAT network was in place, only 10 (33 *per cent*) States/UTs had penetration of ROTs among primary schools and poor masses, thereby resulting in non-achieving of the objectives in 90 *per cent* of the cases.
- Large states having substantial illiterate population such as Uttar Pradesh, Bihar, Maharashtra, Tamil Nadu, Odisha, Jharkhand and Assam had no ROT at all. Thus the objective of reaching quality education to the primary schools in the bigger states was not achieved as of the fifth year of operation of the satellite.

ISRO stated (August 2009) that ROT channel could not be established due to non-readiness in terms of local infrastructure, content and budgetary support from the State Government. DOS stated (February 2010) that most of the states had not made clear plans for implementation due to inadequate budgetary support. This risk could have been mitigated effectively, had the management structure to execute and co-ordinate various activities of EUP been set up as envisaged.

Thus, satellite capacity allocation to states was not uniform and did not follow the declared policy of ISRO. Whereas five important target population states were not allocated any satellite capacity, in another two states the allocation was not commensurate with the target population. There were cases of idling of satellite capacity, allotment of EDUSAT satellite capacity to private TV channels etc. As a result, the reach of educational services to the user agencies could not be ensured.

(i) Thefts of EDUSAT network hardware

Out of 1,065 ROTs established free of cost by ISRO for Rajiv Gandhi Project for EDUSAT Supported Elementary Education, to cover mainly primary schools in Madhya Pradesh, 174 solar plates, 14 television sets and 165 other items, costing in all ₹3.62 crore, were stolen. DOS could not initiate specific action to redeem the losses and stated in February 2010 that IGNOU was the custodian. The reply needs to be viewed in the light of the fact that ISRO did not sign any tripartite⁴¹ agreement as envisaged which could have safeguarded losses due to such events. Further, there were thefts in Odisha, Rajasthan and Tamil Nadu Regional Networks too.

⁴¹ Between ISRO, user and MHRD.

3.1.3.2 Inadequate Content generation

The education content is required to be generated and streamed through the networks. A full time education programme channel would require 6,570 educational programmes per year with three repeat programmes at the rate of 18 hours a day.

Audit observed that:-

- A Deputy Project Director level officer was responsible in ISRO for content generation and social research feedback evaluation. The details of content generation in the networks established under EUP, however, were not available with ISRO except for three networks. As a result, ISRO was not aware of the extent of utilisation of the satellite for educational purposes. The impact evaluation undertaken by the National Institute of Advanced Studies (NIAS), Bengaluru on the pilot phase of EUP had also reported that the content generation was not up to the required level.
- In three networks, against the requirement of 6,570 educational programmes per year for one channel, YCMOU⁴² network was conducting 936 programmes (14.25 *per cent*) per year, Karnataka network was conducting 558 programmes (8.49 *per cent*) per year and Sidhi network was conducting only 150 programmes (2.3 *per cent*) per year.

3.1.3.3 Deficiencies in monitoring and evaluation

A comprehensive project evaluation includes several distinct elements. Monitoring of the project would ensure that the project objectives are being implemented as planned. A project monitoring system enables continuous feedback on the status of its implementation to identify specific problems and risks so that these risks could be mitigated to achieve the desired results. Monitoring and evaluation of the project would also focus on process evaluation to analyse the operational requirements of the project in its interaction with the users and stake holders and focuses on problems in service delivery.

A large number of stake holders comprising Central Government and State Government agencies were involved in the implementation of EUP. It was, therefore, essential to have a structured monitoring and evaluation mechanism to improve the project outcome for the stake holders.

⁴² Yashwantrao Chavan Maharashtra Open University.

There were significant delays in the establishment of networks at the users premises due to reasons such as non-readiness of site, delay in obtaining road permits, etc. This clearly indicated lack of monitoring mechanism to coordinate with different stake holders. These delays occurred when the scarce and valuable satellite capacity meant exclusively for education was idling.

Though a number of national level, inter-departmental and departmental committees were in place the committees did not meet periodically during the period between 2004 to 2010 (when EDUSAT was in operation) to carry out their mandated role. Thus monitoring and evaluation through these committees were deficient as discussed below:-

- A National Core Group (NCG) comprising representatives from IGNOU, ISRO, UGC and National Institute of Educational Planning and Administration (NIEPA) was constituted in September 2004 to prepare programme schedule beginning with the launch of EDUSAT and to look after long term management issues in implementation. However, this could not ensure an adequate plan for preparedness when EDUSAT became operational by November 2004. It failed to prepare an action plan for full utilisation of potential of EDUSAT, plan for proper satellite capacity allocation and plan for timely establishment of networks and allied activities. The scrutiny of files maintained in ISRO revealed that NCG did not meet after August 2005.

Without furnishing specific reply to the shortcomings in the efficiency of the monitoring mechanism available, ISRO stated (August 2009) that while introducing new technology like EDUSAT, most of the elements could be checked end to end only after satellite was made operational and there needed to be a significant time period after launch to realise the ground segment. Reply of ISRO needs to be viewed in the light of the fact that delay in establishing ground network itself occurred due to management issues such as non-readiness of site by the users, delay in shipments and delays in obtaining road permits etc., which had significant impact on the utilisation of EDUSAT. Further, the core group was constituted only one month before the launch of EDUSAT and no action plan for full utilisation of potential of EDUSAT was prepared.

- DOS/ISRO in September 2004 constituted Programme Review Board (PRB) which is an interdepartmental board, consisting of Secretary, DOS, Secretary, MHRD, Vice Chancellor IGNOU, Chairman UGC, Director, NCERT, members from ISRO/DOS (excluding

representatives from user states). Further, DOS/ISRO level Project Management Board (PMB) and Project Management Council (PMC) were also constituted in September 2004. These three committees were constituted by DOS/ISRO considering the larger scope of work, complexities involved and keeping in mind the follow up/coordination and user interfaces required for EDUSAT utilisation.

Audit observed that inter-departmental committee, PRB met only once in June 2005. While PMC met only once in January 2005, PMB met only twice in November 2004 and April 2005.

- Satellite Communication Programme Office (SCPO) of ISRO was responsible for overall management of EUP within ISRO. It was observed in audit that it did not possess information on operationalisation of various networks, number of free and paid hardware supplied, utilisation of networks, content generation etc.

Without furnishing copies of periodic Management Information System reports that helped in monitoring EUP, ISRO stated (August 2009) that annual report of ISRO and monthly report of DECU provided consolidated progress of EUP.

Thus, the committees empowered to look after long term management issues in implementation of EUP and also to carry out follow up, coordination and user interface issues met only during the first year of the operation of the satellite. Therefore the monitoring and evaluation mechanism of EUP was flawed during the remaining five years of operation of EDUSAT.

3.1.3.4 Impact evaluation study conducted by NIAS

ISRO entrusted the impact evaluation of pilot phase of EUP to National Institute of Advanced Studies (NIAS), Bengaluru for completion within 13 weeks from September 2004. NIAS conducted the study between October 2004 and April 2005 in 100 colleges under Visvesvaraya Technological University which was a user of services of EDUSAT in the pilot phase. Some of the observations of the impact evaluation were:

- Performance of SITs was poor during the pilot phase. It was functional in few colleges and seldom used. In 40 *per cent* of the colleges, terminals (ROTs and SITs) were not functioning for different periods of time. DOS merely stated in February 2010 that based on these inputs SIT configuration were reworked and the new configuration was designed and deployed.

- The project had been successful in 32 *per cent* of colleges, partially successful in 47 *per cent* and failed to take off in 21 *per cent* of the colleges.
- Only 27 *per cent* of students watched pilot sessions and lack of awareness about sessions among students was 41 *per cent*. A log book of connectivity, audio/video quality, strength of attendance was not available.

The Impact analysis report concluded that there was a gap between planning and execution which led to a lack of sense of ownership and engagement among the actual users. Despite availability of feedback in April 2005 no measures were taken to improve the effectiveness in utilisation of EDUSAT in further stages. EDUSAT satellite was in operation during the period from 2004 to 2010, the feedback system was, however, not available after April 2005.

Recommendation 2:

In satellite based application programmes wherein stakeholders other than DOS/ ISRO were to be involved, DOS/ISRO may constitute a management structure to sort out issues that would come up during the implementation of the programme.

Recommendation 3:

ISRO should allocate bandwidth to all users in the most objective and transparent manner to avoid differential treatment and subjectivity in the allocation of bandwidth.

Recommendation 4:

ISRO also needs to impress upon users to improve utilisation of bandwidth by creating an appropriate management structure so that the precious national resource is utilised optimally for the benefit of unreached masses and rural population.

3.1.4 Deficiencies in replacement planning of EDUSAT subsequent to its decommissioning

3.1.4.1 Fund requirement for the replacement satellite

Education is a subject in the concurrent list of the Constitution of India and therefore Ministry of Human Resource and Development of the Central Government and State Governments are responsible for preparing and implementing programmes relating to education. The specific role of DOS in its satellite based space application programme was to undertake proof of concept/technology demonstration of the space application programmes so that users could replicate the validated technology and use the satellite capacity.

Audit, however, observed that in EUP, DOS went beyond its scope of demonstration of satellite based education technology and its validation on pilot scale and took on to itself the entire Edusat Utilisation Programme including the role of expansion of ground network connectivity across the country, content generation and monitoring and evaluation.

Based on the direction of the Ministry of Finance and Planning Commission, DOS had decided to charge all the users of INSAT including Government users for social benefit etc. including Department of Telecommunication, All India Radio, Doordarshan, BSNL since 2001. INSAT Coordination Committee (ICC) is an inter-departmental coordination mechanism constituted by the Cabinet Secretariat to plan and allocate the communication satellite capacity from INSAT system. ICC also endorsed the decision of the Government to charge all users of INSAT. It was decided to charge above the floor rate of ₹2.50 crore per unit for the transponders from the Government users. DOS, however, launched a satellite exclusively for education and the satellite capacity was provided free of cost to its users.

After the life of EDUSAT, substantial sum of money (₹700 crore and above) was required to launch and maintain its replacement satellite. The replacement satellite needed to be launched to ensure continuity of the satellite capacity for the ground network connectivity established with substantial investment. Therefore, there needed to be clarity and assurance from the users on the funding aspect and satellite capacity charges (transponder lease charges) need to be collected from the users to make EUP sustainable. Audit, however, observed that there was no clarity/assurance on the funding for the replacement satellite.

After the decommissioning of the EDUSAT in September 2010 the networks operated in the 12 transponders of EDUSAT were shifted mainly to other operational communication satellites such as INSAT 4CR and GSAT-8. The

transponder charges charged for these operational satellites were around ₹ five crore per transponder per year. Though the Central Government decided to charge all the Government users including the users of social benefit, DOS provided the satellite capacity free of cost to its users.

3.1.4.2 Deficiency in planning replacement satellite for EDUSAT

The designed life of EDUSAT was seven years viz. upto September 2011. According to the status of EDUSAT network furnished by ISRO in June 2013, 83 networks consisting of 48 hubs, 4,652 SITs and 51,429 ROTs were established as of June 2013.

The replacement strategy to EDUSAT transponders was to be planned in its orbital slot at 74° East to have continuity for operational EDUSAT networks. ISRO planned replacement to EDUSAT transponders in GSAT-14 only in 12th Five Year Plan period (2012-2017). It was, therefore, evident that ISRO could not plan replacement for EDUSAT transponders in time to provide continuity to operational EDUSAT networks. Inadequate planning of replacement strategy for EDUSAT had resulted in idling of operational networks of EDUSAT networks at the time of decommissioning of EDUSAT in September 2010. Prior to decommissioning of EDUSAT in September 2010, there were onboard power constraints leading to reduction in the number of operational transponders. Due to these constraints 10 networks were shifted to INSAT 4CR satellite in September/October 2008, seven networks shifted to the same satellite in June/July 2009 and another 13 networks shifted in May 2010. Thus, a total of 30 networks were shifted prior to decommissioning of the satellite. Out of 74 networks established in EUP prior to its decommissioning, two networks for Andaman and Nicobar Islands were operating through INSAT 4A. The balance 42 networks were operating in EDUSAT. Idling of these operational networks is explained below:

- 42 networks were idling for more than three months from September 2010 to December 2010.
- 23 networks were idling for more than seven months from September 2010 to April 2011.
- 18 networks were idling for more than one year from September 2010 to April 2011.
- 13 networks were idling for more than two and half years from September 2010 to June 2013.

ISRO stated (March 2011) that prior to decommissioning of EDUSAT, there were on-board power constraints leading to reduction in number of operational transponders. It added that EDUSAT power anomaly leading to de-commissioning was unexpected and premature incidence. The reply is not tenable since ISRO planned replacement to EDUSAT transponders in GSAT-14 only in 12th Five Year Plan period (2012-2017), even though EDUSAT was to complete its designed life by September 2011. Operational EDUSAT networks in Ku band transponders were shifted to INSAT 4CR satellite. This satellite was launched to provide DTH⁴³ and telecom services in the country. Inadequate replacement strategy to EDUSAT had therefore impacted services planned under INSAT 4CR also.

3.1.4.3 Diversion/lending of ISRO funds

In terms of guidelines⁴⁴ of ISRO, works executed by it on behalf of other bodies were to be from deposits obtained from them. Appropriate departmental charges were to be levied for these deposit works. It was observed in Audit that instead of the aforesaid arrangement, ISRO signed an MOU with Antrix Corporation Limited (ACL) in September 2005, authorising the latter to raise demand and collect cost including their commission and taxes. During the period 2003-09, ISRO incurred a total expenditure of ₹180.79 crore from its budget head instead of against deposits collected from users on whose behalf the works were executed. Appropriate departmental charges aggregating ₹12.65 crore⁴⁵ were also not levied and collected. Such a violation resulted in diversion of ISRO's budget of ₹180.79 crore and loss of departmental charges of ₹12.65 crore. The cost realised by ACL was transferred to ISRO with delays ranging from one to three years resulting in loss of interest of ₹24 crore. Further, specific network and its elements should have been finalised to utilise the satellite fully by its launch and operationalisation in November 2004, duly taking into account requirement of users.

ISRO stated (August 2009) that DOS guidelines regarding deposit works to be executed from deposits obtained from them were not followed since the specification of state specific EDUSAT network and its elements were not finalised and added that ACL was involved to take up further expansion activities on a commercial model. DOS stated (February 2010) that in order to ensure speedy execution of the project, ACL was involved. Reply of ISRO/DOS needs to be viewed in light of the fact that ISRO's guidelines of 2001 prescribed undertaking of works on deposit basis.

⁴³ Direct to Home

⁴⁴ June 2001.

⁴⁵ Seven per cent of ₹180.79 crore.

DOS admitted in February 2010 that delay in the installation of networks was due to non-readiness of the sites by users and delays in certifying the work which led to delayed transfer of money to ISRO. Without citing specific cases, ISRO stated that in some cases ACL had to return money to the user. The reply of ISRO is not acceptable, since the amount for deposit work should in the first instance have been placed with ISRO and not ACL. Accordingly the amount remitted to ISRO as deposit work could also have been returned in such exceptional cases. ISRO agreed to furnish details of hubs and terminals to Accounts Division in future to raise demands on ACL.

Recommendation 5:

In satellite based application programmes of DOS/ISRO, it should implement replacement strategy for the existing satellite in advance to avoid interruption to its satellites based operational programmes.

3.1.5 Conclusion

EDUSAT, launched by the DOS in September 2004 was India's first thematic satellite dedicated exclusively for educational services to provide distance education service to remote areas of India with a total investment of ₹549.09 crore. The investment of the satellite was not returned since the intended benefit of the programme was largely not met.

EDUSAT was in operation for six years from September 2004 to September 2010. 57 per cent of the satellite capacity of the EDUSAT was idling as late as the fifth year of its operation. The bigger states with higher illiteracy such as Uttar Pradesh and Bihar did not have an EDUSAT network even in the fifth year of operation of the satellite. In fact Uttar Pradesh, which had an illiterate population of more than nine crore, did not have any network as of June 2013. None of the states and Union Territories could achieve envisaged 1,200 interactive satellite based educational terminals meant for colleges and universities. Large states having substantial illiterate population such as Uttar Pradesh, Bihar, Maharashtra, Tamil Nadu, Odisha, Jharkhand and Assam did not have satellite based receive only educational terminals meant for schools. The objective of reaching quality education to the primary schools in the bigger states was not achieved even as late as the fifth year of operation of the satellite. Thus, the objective of reaching quality primary, higher, technical and professional education to the unreached poor masses of the country remained unachieved.

In addition to non-achievement of the objectives of the EUP, there were deficiencies relating to its planning, implementation of projects in the area of

establishment of ground network for the satellite, generation of the education contents for the ground networks and monitoring and evaluation of the programme to effectively coordinate activities among the stake holders of the project. There were considerable delays in establishment of ground networks. The underutilisation of satellite in terms of network connectivity averaged to 91 *per cent* during the life of the satellite which resulted in idling of hubs which impacted availability of educational programmes. Bandwidth allocation to states was not done transparently as the same was not allotted uniformly to all states against the declared policy of ISRO. Inadequate replacement strategy planning for EDUSAT had resulted in idling of operational EDUSAT networks and impacted services planned under INSAT 4CR.

Thus, the objectives of implementation of EDUSAT could not be achieved even at the end of its life.

3.2 Parking of a foreign satellite in Indian Administration coordinated orbital slot

Department of Space allowed a foreign private satellite service provider to park its satellite in an orbital slot coordinated by the Indian Administration and meant for Indian Satellites, in violation of the country's SATCOM policy and International Telecommunication Union's radio regulations.

Orbital slot is the position of geo-stationary satellite above earth. Member countries under the framework of United Nations acquire these orbital slots through a coordination process at International Telecommunication Union (ITU)⁴⁶.



Orbital slots once allocated can be held by a member country for seven years. If the country does not use them within the stipulated period of seven years, the slot allocated would lapse. Hence each country has to prepare orbital slot filings for country-specific slots and occupy the allocated slots within the due diligence period. The long-drawn process of filing and coordination with ITU and due diligence principle make filings for India-specific orbital slot an important and critical

⁴⁶ The International Telecommunication Union is the United Nations specialized agency for information and communications technologies, which allocates global radio spectrum and satellite orbits.

activity. Thus an orbital slot, availability of which is scarce and is hence a valuable resource, is required to be used optimally and judiciously and also to be protected.

Indian Administration in ITU is represented by the Wireless Planning and Coordination (WPC) Wing of the Department of Telecommunications. There are no regulatory provisions in the International Radio Regulations⁴⁷ (IRR), for permitting the use of orbital position coordinated by the Administration of a country by a third party. Therefore an orbital slot acquired by Indian administration is to be coordinated for Indian satellite systems only.

Further, the norms, guidelines and procedures of SATCOM Policy approved by Union Government in January 2000, as applicable to satellites developed by DOS or private Indian satellites, stipulated the following mechanisms by which satellite capacity could be made available to private parties:

- Paragraph 2.5 of the guidelines allows the INSAT Co-ordination Committee (ICC) to earmark a certain percentage of capacity for use by those non-governmental users who have been authorised by law. Operations with INSAT and providing services in India will be subject to the party obtaining the requisite operating and frequency/siting license from the concerned authorities.
- The paragraph 2.7 of the guidelines allows DOS to build up capacity for a non-government party at its request based on commercial considerations.
- The paragraph 3.1 of the guidelines authorises the Indian Administration (WPC) in consultation with DOS and other concerned regulatory authorities to inform, notify, co-ordinate and register satellite systems and networks by and for Indian private parties following certain well-defined and transparent norms.

Accordingly ICC earmarks certain percentage of the capacity of Indian Satellites (INSAT) owned by Government of India on a non-exclusive basis to Indian private users. These satellites in INSAT system are placed in Indian Administration coordinated orbital slots. The responsibility of ISRO in the customer specific satellites is to make a satellite and launch it into the orbital slot made available by the customer. The SATCOM policy does not provide parking of foreign satellites in the Indian orbital slot.

⁴⁷ Radio regulations are prepared by ITU member states and contain general rules for the assignment and use of frequencies by the member states. The regulations have the status of an international treaty and are binding on the ITU member states.

In the course of audit, it was observed that ISRO allowed Intelsat, an international private satellite organisation to place their satellite at 55°E in an orbital location coordinated by the Indian Administration. The foreign satellite was also allowed non-Indian coverage. Audit scrutiny, further, revealed that:

The Indian communications satellite INSAT 2DT stopped functioning from February 2003. Its replacement satellite INSAT 3E was planned for launch in later part of 2003. ISRO leased in 16 transponders from Intelsat⁴⁸ (having 68 transponders in all) for one year (February 2003 to February 2004) as a stop gap arrangement to ensure continuity of services of INSAT 2DT. The foreign satellite was shifted to the orbital location of INSAT 2DT viz. 55°E. As per the terms of the agreement, ISRO was to pay a sum of USD two million as Earnest Money Deposit, USD 5.6 million upon deployment of the satellite to 55°E and half yearly charges of USD 7.6 million to Intelsat for the services of 16 transponders. The remaining 52 transponders of the Intelsat satellite were allowed to function from this orbital slot free of cost.

Audit also observed that although the replacement satellite to INSAT 2DT, INSAT 3E was launched in September 2003, ISRO allowed the Intelsat satellite IS 702 to continue to function from the same location. ISRO signed another agreement with Intelsat (March 2004) requesting Intelsat to place its satellite IS 702 at 54.85°E nominally collocated with INSAT 3E, 55°E, as a backup to INSAT 3E free of charge. Intelsat was allowed to use INSAT's ITU filings for non-Indian coverage. The agreement, initially valid for five years up to March 2009, was extended seven times up to August 2011.

It is pertinent to note that there was also no existing practice in ISRO to provide backup to operational satellites.

Thus ISRO allowed the use of a valuable Indian Administration coordinated orbital slot which was meant for Indian satellites, by a foreign private satellite service provider for non-Indian coverage thereby violating the country's SATCOM Policy and ITU's radio regulations. In the process, ISRO extended undue benefit to the foreign party.

ISRO stated (September 2012) that each country adopts the country specific radio regulation and added that usage of orbital slot coordinated or owned by member countries by private parties was an international practice. Department of Space further added (July 2013) that the strategy of locating Intelsat to 55°E was to acquire additional orbital slot in Ku band for the Indian Administration and protect the coordination rights which otherwise would have been elapsed rather than generating revenue.

⁴⁸ IS-702 satellite

The reply of ISRO needs to be viewed in the light of WPC clarification (March 2004) with regard to continuation of Intelsat IS-702 at 55°E. It confirmed the settled view, "fully known to DOS" that there are no regulatory provisions in radio regulation for permitting the use of this orbital position by a third party and also stated that DOS would remain the operator for the proposed satellite system to use the orbital slots which are being coordinated for Indian Satellite Systems. Further, the question of lapsing of orbital rights for the location 55°E also did not arise as the replacement satellite INSAT 3E was launched within one year whereas the due diligence period for occupying an orbital slot is seven years.

It is evident that Indian Administration coordinated orbital slots were to be used by Indian satellites. By allowing a foreign satellite to occupy the Indian slot, ISRO violated the country's SATCOM policy as well as the ITU radio regulations and thereby extended undue benefit to the foreign private firm.

3.3 Loss due to unsafe transport and belated insurance of consignment

Liquid Propulsion Systems Centre, Mahendragiri did not ensure safe sea transport of a Liquid Hydrogen Storage Tank procured at a cost of ₹6.15 crore resulting in extensive damage to the consignment, due to which additional expenditure of ₹1.36 crore was incurred on repair. Insurance claim of ₹3.39 crore was also rejected by the Insurance Company due to delay in obtaining the cover.

Liquid Propulsion Systems Centre, Mahendragiri (LPSCM) is a unit of Indian Space Research Organisation (ISRO), Department of Space (DOS), responsible for the development and testing of liquid rocket engines. To meet the need for the augmentation of liquid Hydrogen storage for Cryogenic project (C25), LPSCM placed a purchase order on Gardener Cryogenics, USA (manufacturer) (March 2006) for the design, fabrication and supply of 125 kilo litres Liquid Hydrogen Storage Tank at a cost of USD 1,316,778.86⁴⁹ ex-works⁵⁰ Bethlehem, PA USA to be despatched by sea with a delivery period of 15 to 17 months. The consignment was despatched in November 2007 and LPSCM made a total payment of ₹5.71 crore during the period June 2006 to December 2008 to the manufacturer against the purchase order.

⁴⁹ Including USD 25,778.86 as cost of spares and accessories

⁵⁰ According to the International Trade Rules INCOTERMS 2000, under an ex-works transaction, the seller places the goods at the disposal of the buyer at the seller's premises and the buyer has to bear all costs and risks involved in transporting the goods from the seller's premises.

Since the transaction was processed on ex-works basis, the responsibility for all costs and risks involved in transportation of the goods from the manufacturer's premises to the destination lay with LPSCM. The shipment of the consignment upto Mahendragiri, including ocean freight, transportation charges, customs charges, etc. was entrusted to Balmer Lawrie & Co. Ltd. (freight forwarder) who was the authorised air consolidation agent of DOS, for USD 109,804 and ₹44.47 lakh was released as advance (February 2008).

While taking delivery of the consignment (February 2008), it was noticed that the storage tank had suffered heavy damage during the voyage. A Committee was constituted (March 2008) to assess the external damages to the storage tank. The Committee recommended replacement of the damaged components and repair of the external damages to the tank. Accordingly, LPSCM placed two separate purchase orders on the manufacturer for replacement of the damaged items (May 2009) at a cost of USD 93,585 and repair of dents and support assistance (September 2010) through a local firm Gamma Technik at a cost of USD 207,200. The manufacturer completed the repair work by February 2011.

The manufacturer informed LPSCM (May 2011) that while repairing the damages to the storage tank it was discovered that the inner supports of the tank had yielded and expressed the view that the damage to the internal supports of the tank would not have occurred if the tank was properly secured to the deck of the ship. This indicated that adequate care was not taken in the transportation of the storage tank.

LPSCM incurred an expenditure of ₹42.25 lakh towards replacement of the damaged items and ₹93.87 lakh for the external repair work. Another Technical Expert Committee was constituted (June 2012) which assessed the internal damages to the tank. The Expert Committee recommended a set of eight tests for the operation of the tank. The storage tank was finally commissioned in May 2013, after lapse of over five years from the date of procurement.

In this regard audit observed that:

- i. Before entrusting the sea shipment of the storage tank to their air consolidation agent, LPSCM neither ascertained the transportation requirements for the safe sea voyage of the cargo from the manufacturer nor obtained reasonable assurance on the expertise and experience of the freight forwarder in this field.
- ii. LPSCM did not take an all risk insurance policy to cover risks of damage to the high value consignment during the sea voyage. The

freight forwarder took an insurance policy for the consignment with National Insurance Company Limited for a value of ₹5.68 crore belatedly only in January 2008 i.e after the consignment had encountered bad weather and had been damaged during the voyage (December 2007). The fact that the consignment had already suffered damage was not disclosed at the time of taking insurance. Consequently, the insurance claim preferred by LPSCM for an amount of ₹3.39 crore (November 2008) was repudiated by the insurance company (November 2011) on the ground that the insurance was taken after the consignment had already suffered damage.

Thus LPSCM entrusted a high value shipment to the freight forwarder for transportation by sea without adequately addressing the safety requirements of the ocean freight and also failed to insure the consignment in advance to safeguard against the risks involved in the long sea journey. This had resulted in loss of ₹3.39 crore towards the insurance claim and additional expenditure of ₹1.36 crore on repair work besides non-utilization of the storage tank for the intended purpose.



DOS, while admitting that there was no agreement with the freight forwarder for transportation of sea consignments, stated (February 2013) that the damage to the consignment occurred due to unforeseen rough weather and hence the incident fell under the “force majeure” condition. DOS also stated that the consignment was not insured since the item was a robust hardware meant for outdoor installation and did not come under the classification of extremely delicate, highly sensitive, sophisticated equipment of fragile nature to qualify for special insurance measures. DOS further added that LPSCM had preferred a claim with the freight forwarder to reimburse the extra

expenditure incurred by the Department due to the damage of the consignment in transit.

The reply given by DOS is not acceptable in view of the fact that the responsibility for the safe shipment of the storage tank lay with LPSCM. LPSCM failed to take adequate measures to ensure safe passage of the high value consignment as well as to protect its interests against the risks involved in the transportation. LPSCM did not get the consignment insured in advance against all risks which include rough weather during sea voyage even though insurance of costly equipment purchased from abroad which are not easily replaceable is enabled under the financial powers of DOS. While DOS in its reply stated that claim to reimburse the additional expenditure incurred due to damage of the consignment was made, it did not furnish any document in support of its claim.

Thus failure to take sufficient care in ensuring safe transportation of the Liquid Hydrogen Storage Tank over a long sea journey and timely insurance of the consignment resulted in additional expenditure of ₹1.36 crore⁵¹ on repairs without any option to mitigate these losses through insurance.

⁵¹ ₹42.25 lakh (replacement of parts) plus ₹93.87 lakh (repair work)

CHAPTER – IV

Department of Scientific and Industrial Research

4.1 Public Private Partnership for setting up ‘The Centre for Genomic Application’ by Institute of Genomics and Integrative Biology

Institute of Genomics and Integrative Biology (IGIB) signed an agreement with the Institute of Molecular Medicine (IMM), a private partner for setting up ‘The Centre for Genomic Application’ (TCGA). IGIB did not follow due diligence before selecting the private partner. The agreement with IMM did not have adequate provisions for safeguarding interests of Government. TCGA could not achieve self-sufficiency, as envisaged. The pricing policy for its services was uneconomical. The financial practices of TCGA leaned in favour of the private partner, as apparent from undercharging of services rendered, booking of expenditure unrelated to TCGA in its accounts and not charging the partner for use of equipment belonging to IGIB. The monitoring mechanism established for TCGA was lax. Advisory Council of TCGA did not issue the policy framework and guidelines for operation of TCGA by the private partner. The objective of TCGA becoming a national research facility and a shared resource for use by universities, industries and laboratory groups remained largely unachieved. The activities of TCGA were suspended in August 2011.

4.1.1 Introduction

The Institute of Genomics and Integrative Biology, New Delhi (IGIB), a constituent laboratory of Council of Scientific and Industrial Research (CSIR), New Delhi under the Department of Scientific and Industrial Research (DSIR) focuses on biological research and development especially in the areas like genomics⁵² and proteomics⁵³.

The Institute entered into a Public-Private Partnership (PPP) agreement in April 2003, with a private company, Chatterjee Management Services (CMS), to establish The Centre for Genomic Application (TCGA). Later (July 2004), at the request of CMS, the institute replaced said agreement by entering into another agreement with Institute of Molecular Medicine (IMM), a sister company of CMS, on the same terms and conditions.

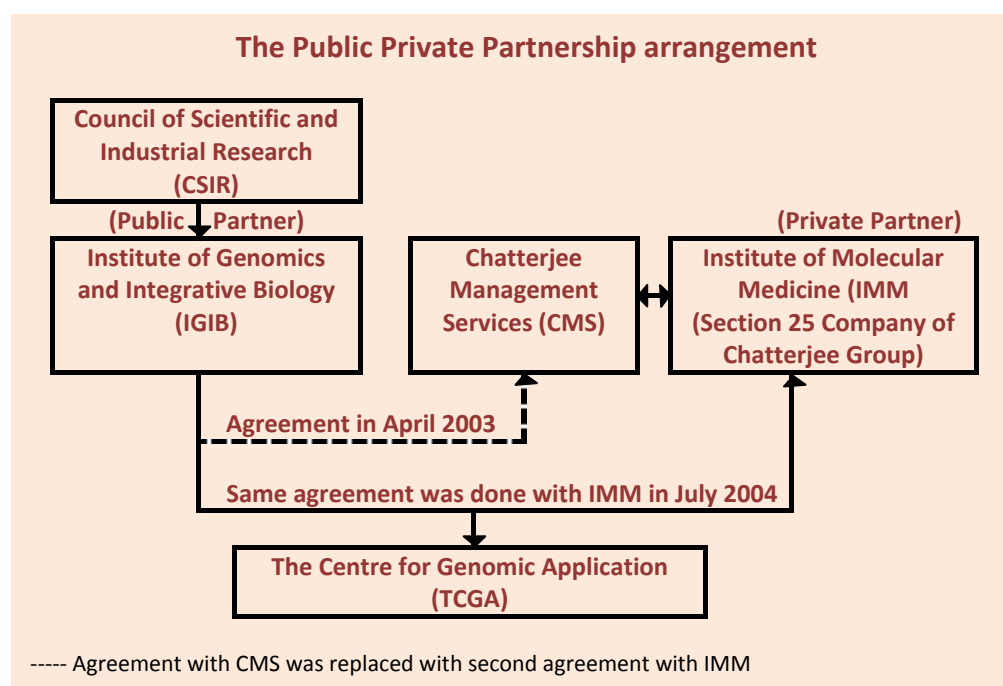
⁵² Genomics is a discipline in genetics concerning the study of the genomes of organisms.

⁵³ Proteomics is the large-scale study of proteins, particularly their structures and functions.

The stated objectives of this facility were to:

- **Create infrastructure** at par with the best international research facilities to provide support to Research and Development (R&D) institutions, Universities (small laboratories) and industry to promote easily affordable genome and proteome research in the country;
- **Develop and operate the facility as a national facility** and as a shared resource for use by universities, industry and laboratory groups;
- **Provide incubation laboratory facilities** to start up entrepreneurs in biological sciences with minimum capital investment thereby enabling development and transfer of technologies through R&D partnership with industry, universities and CSIR/IGIB;
- **Develop human resource** and provide hands on training to scientists/technical personnel in genome and proteome research;
- **Operate TCGA** on charge for service basis.

TCGA began its operations from 11 May 2004 and after operating for about seven years, its activities were temporarily suspended on 31 August 2011 citing administrative reasons. The PPP arrangement of TCGA is depicted as below:



The audit of this facility was conducted with a view to evaluate and assess the performance of the PPP arrangement of TCGA including process of selection of partner, financial arrangements, activities and extent to which its objectives as envisaged were fulfilled for 2004-05 to 2011-12. Audit examined records relating to TCGA maintained by IGIB as well as the private partner IMM.

Chronology of events leading to setting up of TCGA

Date	Event
December 2000	The Chatterjee Group expressed its interest to the Minister of Science and Technology in setting up a world class research facility in Genomics and Proteomics in joint collaboration with Department of Bio-technology.
March 2001	The Chatterjee Group again expressed its interest to the Secretary, Department of Biotechnology and IGIB in setting up the facility in collaboration with Department of Bio-technology.
February 2003	IGIB commissioned an industry analysis of custom laboratory products and services in the area of genomics and proteomics through a Consultant (Ernst and Young).
April 2003	CSIR approved the proposal for setting up of proposed Core Shared Research Facility with the Chatterjee Group.
April 2003	IGIB entered into an agreement with Chatterjee Management Services for setting up of Core Shared Research Facility called The Centre for Genomic Application.
June 2003	Ernst and Young submitted its report, which identified 12 companies both multinational and Indian, which were operating in the same field in the market. Market size was estimated to be worth ₹80 to ₹100 crore and was expected to grow by 400 <i>per cent</i> within a period of seven years i.e. from 2001 to 2007.
July 2003	IGIB submitted a proposal to Department of Science and Technology for funding of its share in the PPP.
January 2004	Pending construction of TCGA building on land provided by CSIR, private partner hired a space of 6,600 sq.ft. at Okhla for operation of TCGA activities.
February 2004	The Government share of ₹11.30 crore in the PPP was approved by Department of Science and Technology.
May 2004	Operations of TCGA begin.
July 2004	IGIB, on the request of Chatterjee Management Services, signed an agreement with Institute of Molecular Medicine, a Section 25 company of the Chatterjee Group, replacing the earlier agreement with Chatterjee Management Services for undertaking the project on the same terms and conditions.
May 2006	The Government share was subsequently revised to ₹13.55 crore due to increase in cost of equipment because of foreign exchange fluctuations.
August 2011	Activities of TCGA were suspended reportedly due to delays in completion of TCGA building and to save the huge cost of rental on hiring premises.

4.1.2 Selection of partner

As stated earlier, The Chatterjee Group, a private group having investments in Indian and international companies in the bio-technology sector, approached (March 2001) Department of Bio-technology (DBT) and IGIB for setting up a world class research facility in Genomics and Proteomics in collaboration with Department of Bio-technology. CSIR approved (April 2003) the proposal following which IGIB entered (April 2003) into an agreement with Chatterjee Management Services⁵⁴ (CMS) for setting up of Core Shared Research Facility to be called as The Centre for Genomic Application (TCGA).

Earlier (February 2003) IGIB had commissioned a consultant (Ernst and Young) to conduct an industry analysis of custom laboratory products and services in the area of genomics and proteomics. The Consultant submitted its report (June 2003) and identified 12 companies⁵⁵ both multinational and Indian, which were operating in the same field in the market. Market size was estimated to be worth ₹80 to ₹100 crore and was expected to grow by 400 *per cent* within a period of seven years i.e. from 2001 to 2007. It was observed that IGIB selected the partner in April 2003, without waiting for the Consultant's report.

Thus while selecting the partner for the national level facility, due diligence process for identification of the project, conducting a feasibility study to determine the market size and growth, detailed project report, parameters for selection of partner, list of possible partners and transparent procedure for selecting the partner was not done.

CSIR stated (April 2010) that selection of the partner was on the basis of their credentials world-wide in the field of Genomics and no bidding system could have brought out such a partner willing to invest in scientific infrastructure in the country.

CSIR's reply is not acceptable as it was seen from the Consultant's report (June 2003), that there were at least a dozen companies of equal repute in this field. IGIB did not invite offers from these entities before signing the agreement with CMS and selected the private partner for the project without following a transparent and competitive process.

⁵⁴ A company of The Chatterjee Group

⁵⁵ Messrs.Hysel India Ltd., Labmate (Asia) Ltd., Sigma Aldrich, Qiagen, Genetix, Microsynth, Stratagene, Invitrogen, Promega, Amersham Plc., Bangalore Genei Pvt. Ltd. and BioServe Biotechnologies Ltd.

4.1.3 Agreement with Private Partner

Although IGIB had entered into an agreement with Chatterjee Management Services (CMS) in April 2003 for setting up of TCGA, but at request of CMS the same was replaced (July 2004) with another agreement with Institute of Molecular Medicine (IMM), a Section 25 Company⁵⁶ of the Chatterjee Group for undertaking the project on the same terms and conditions.

The salient features of agreement with the private partner were as follows:

- IGIB would provide land for TCGA building and install 10 major equipment/ facilities
- IMM would provide ₹12.50 crore including capital of ₹ 10 crore (₹ nine crore for building and ₹ one crore for equipment) and recurring cost of ₹2.50 crore.
- TCGA would provide services on a fee basis and generate adequate resources to become self-sustaining from the second year onwards.
- With regard to facility management, IMM would have full rights in all matters relating to finance, legal and appointment of manpower of TCGA.
- Two bodies i.e. Advisory Council and Monitoring Group with members of CSIR, IGIB and IMM would be constituted to oversee activities of TCGA.
- In case of premature termination of the project, ownership of equipment/ facilities procured out of CSIR/IGIB funds would remain with CSIR/IGIB and the equipment procured from the income of TCGA would remain as joint property of IMM and CSIR/IGIB. The building of TCGA would be transferred to CSIR/IGIB on payment of its book value to IMM.

Audit found following deficiencies in the agreement:

- Proper structure of TCGA in the form of a separate legal entity such as Partnership firm/Company under Companies Act or Society under Society Act or any other form of special purpose vehicle was neither defined nor formed.
- The clauses in the agreement were not framed in a manner whereby the risk involved in the PPP arrangement to both parties would be identified or shared in a balanced manner. As per the agreement, liability of IMM if

⁵⁶ Section 25 companies are non-profit oriented companies, formed for the sole purpose of promoting commerce, art, science, religion, charity or any other useful object. Such companies are required to apply their profits, if any, or other income only in promoting their objects and are also prohibited from payment of dividends to their members.

any, due to operation of TCGA were to be restricted to a total of ₹3.50 crore over the project duration, however no such limit was kept for IGIB. Further, though the facility was planned to be established in New Delhi, cost of land provided by IGIB was not included in the project outlay.

- There were no terms and conditions in the agreement compelling IMM to reinvest the income generated from operation of TCGA for its financial growth, thus leaving scope for diversion of income earned from TCGA by IMM to its other projects.
- The agreement had no penalty clauses in case of deficiencies in fulfilling the conditions agreed in the PPP agreement by the private partner.
- The agreement did not provide for an alternative plan to meet requirement of resources in case TCGA did not become self-sufficient.
- No provision was made for preparation of separate books of accounts of TCGA to depict its operational results and financial position. Provisions for adequate oversight and audit were also not incorporated in the agreement.

IGIB, while accepting the lacunae in the agreement, stated (November 2009) that the agreement would be amended by defining the role and responsibilities of the two parties in more clear terms, particularly with respect to financial liabilities/obligations/responsibilities. However, the stated amendments in the agreement were not made (March 2012). TCGA's activities were suspended with effect from 31 August 2011.

Regarding reinvestment of income into TCGA, it stated that IMM, being a Section 25 company, could not have taken out the revenue from the system. All the revenue generated under the activity after meeting its costs of operation was expected to be reinvested.

The reply of CSIR is not acceptable since TCGA was not a Section 25 company; it was only a project of IMM. Hence, the possibility of diversion of TCGA's income by IMM to its other projects could not be ruled out. As the accounts of TCGA were merged in the accounts of IMM and not compiled separately, this could not be conclusively verified.

4.1.4 Funding Arrangements

As per the agreement IMM committed ₹12.50 crore (₹nine crore on building construction, ₹one crore on equipment and ₹2.50 crore on recurring expenditure) and CSIR/IGIB was to bring in all major equipment necessary for

the facility. The estimated value of the equipment to be provided by IGIB was not specified in the agreement.

IGIB submitted a proposal to the Department of Science and Technology (DST) in July 2003 for funding the government share in the PPP. IGIB however, did not intimate DST about the agreed share of private partner in the project. The government share was approved by DST in February 2004 as ₹11.30 crore⁵⁷ with scheduled completion in February 2005, which was subsequently revised to ₹13.55 crore by increasing the DST's contribution by ₹2.25 crore⁵⁸ (May 2006) with scheduled completion of the facility by March 2007.

Thus, the total outlay was ₹26.05 crore as below:

(₹in crore)

Table 8- Distribution of government and private share in setting up of TCGA

		Government share	Private share	Total
Capital	Building	0.00*	9.00	9.00
	Equipment	13.00**	1.00	14.00
Recurring		0.55	2.50	3.05
Total		13.55	12.50	26.05

*Land for proposed building was to be provided by IGIB, cost of which was excluded.

**Financial value of equipment was not defined in the agreement.

4.1.5 Financial performance and working results

IMM was fully responsible for operating TCGA, yet it did not maintain separate accounts for TCGA and instead, merged the transactions pertaining to TCGA in its own accounts. Audit was provided extracts of accounts relating to TCGA for 2004-05 to 2010-11.

After commencement of audit of PPP project of TCGA by the C&AG of India, IGIB got the extracted accounts of TCGA audited for the years 2009-10 & 2010-11. The auditors had submitted their audit report which was not accepted by IMM till March 2012. The audit report was not made available to Audit.

⁵⁷ Share of DST, CSIR and IGIB were ₹ six crore, ₹2.72 crore and ₹2.58 crore (including recurring cost of ₹0.55 crore) respectively.

⁵⁸ Citing reasons of foreign exchange fluctuation in the cost of the equipment

The working results of TCGA during 2004-05 to 2010-11, as seen from the extract of TCGA accounts were as under:

(₹in crore)

Table 9- Financial performance of TCGA during 2004-11

Year	Turnover	Expenditure	Profit / (Loss)	Percentage Profit/ (Loss)
2004-05	1.12	2.25	(1.13)	(100.89)
2005-06	3.65	3.91	(0.26)	(7.12)
2006-07	6.62	6.23	0.39	5.89
2007-08	8.35	8.45	(0.10)	(1.20)
2008-09	8.93	8.50	0.43	4.82
2009-10	6.97	9.96	(2.98)	(42.75)
2010-11	4.80	7.71	(2.91)	(60.63)
	40.43	47.00	(6.57)	

As seen from the above table -

- In five years out of seven, TCGA suffered losses ranging from one to 101 per cent of its annual turnover.
- The performance of TCGA peaked during 2006-07 and 2008-09 but declined steadily thereafter during 2009-10 and 2010-11.

Thus, TCGA could not become self-sufficient even after seven years of operation, though as per the agreement it was expected to become self sustaining from the second year onwards.

4.1.6 Implementation of the project

The following deficiencies and irregularities in implementation of the project were noticed.

4.1.6.1 Irregular booking of expenditure on building

In terms of the agreement, IMM was required to construct TCGA building at a cost of ₹ nine crore from its own resources. IMM borrowed loans from banks for meeting this commitment and booked interest and loan-processing fees of ₹4.98 crore accrued on the borrowed funds as part of its contribution, which was incorrect. This was included in the total expenditure of ₹16.11 crore stated to have been incurred by TCGA upto 31 March 2011.

TCGA replied (December 2009) that all the interest and processing fee charged in construction would be adjusted. However, reversal of such booking was not done (March 2012).

4.1.6.2 Excess payment of Project Management fee

For developing the concept, designing and construction management of TCGA building, IMM engaged the services of its sister concern TCG Developments India Pvt. Ltd. (TCGD). A Development Management Agreement was signed between IMM and TCGD in February 2004 (even before agreement with IGIB for setting up TCGA was made), which stipulated that TCGA building was to be completed within time schedule of 18 months⁵⁹, for which a total fee of ₹83 lakh⁶⁰ was to be payable to TCGD. The agreement further stated that if the project was delayed beyond the stipulated period of 18 months due to failure on the part of IMM, then monthly fee at the rate of 75 *per cent* of normal monthly fees (i.e. ₹1.50 lakh per month) would be payable to TCGD for such period of delay.

Audit observed that due to delay in receiving the statutory approvals, construction work of TCGA building was hampered. The project management fee which was required to be paid to TCGD at reduced rate of ₹1.50 lakh per month beyond July 2005 was instead, enhanced by IMM to ₹3 lakh and ₹4 lakh per month in December 2005 and February 2007 respectively, without any justification and assessment of work.

Between August 2005 and September 2010, a total payment of project management fees of ₹1.77 crore⁶¹ was made to TCGD at enhanced rates, which was in excess of admissible amount by ₹85.50 lakh.

Audit further noted that IGIB did not see any conflict of interest in allotment of work of design and construction management of TCGA building by IMM to its sister concern. The rates and terms were disproportionately advantageous to TCGD as the exit clause of agreement signed between IGIB and IMM permitted reimbursement by IGIB of all such charges as discussed above, as a part of book value of the building, in the event that it is taken over by IGIB due to winding up of the project. The total payment/debits of ₹3.25 crore made up to 31 March 2011 towards design and construction management etc. of TCGA building worked out to more than 36 *per cent* of original estimated cost of building. The building still remained under construction (March 2012).

TCGA accepted (March 2012) the audit observation and assured that necessary adjustments would be made in due course of time.

⁵⁹ From 01 February 2004 to 31 July 2005

⁶⁰ ₹47 lakh for designing and ₹36 lakh as monthly fee at ₹ two lakh per month for 18 months

⁶¹ excluding Service Tax of ₹20.01 lakh

4.1.6.3 Avoidable expenditure due to excess payment of rent

Pending construction of TCGA building, IMM hired a space of 6,600 sq.ft. at Okhla in January 2004. In this regard, IMM signed three separate agreements⁶² with the owner on a total monthly rental of ₹3.17 lakh for three years with condition that each agreement would be renewed for next two terms of three years each on the same terms and conditions, subject to payment of escalation at the rate of 15 *per cent* on the last paid monthly rentals.

Audit observed that after expiry of first term of agreements, IMM renewed the agreement (March 2007) with the owner, merging all three previous agreements into one. As per new agreement, a monthly rental of ₹5.61 lakh was fixed for hiring of premises, facilities and maintenance of hired facilities, which was 77.53 *per cent* higher than the last monthly rental paid by TCGA. As a result, TCGA incurred an expenditure of ₹3.18 crore during March 2007 to August 2011 on account of rental charges, of which ₹1.15 crore was paid in excess, due to its failure to invoke the clause of renewing the earlier agreements instead of entering into a fresh agreement.

CSIR stated that the landlord refused to renew the agreement unless the enhanced rates were paid and IMM did not have unilateral rights to enforce its renewal. The reply was not acceptable as IMM did not invoke the relevant clause of the agreement which provided that the rent would be escalated upto only 15 *per cent* of the last paid monthly rentals.

Thus, TCGA incurred an avoidable expenditure of ₹1.15 crore which had a negative impact on its financial position.

4.1.6.4 Irregular allocation of government space to private partner

As stated in para 4.1.6.3, IMM hired (January 2004) a space of 6,600 sq.ft. on the ground and first floor of a building at Okhla to run TCGA activities. Later (March 2005), IMM assessed additional requirement of 1,000 sq.ft. for TCGA and hired (May 2005) space of 4,300 sq.ft on third floor of the same building. As this space was in excess of TCGA's requirement, IGIB on the request of IMM, hired (May 2005) the extra space of 3,800 sq.ft for installing its super computer.

Although CSIR had instructed (March/May 2005) IGIB to seek approval of the Governing Body of CSIR for hiring the space, but IGIB did not obtain the

⁶² (i) Hiring of premises, (ii) Hiring of facilities viz. air conditioning for the occupied leased space, diesel generator set, fire-fighting equipment etc. and (iii) Maintenance of hired facilities on monthly rental of ₹1.80 lakh, ₹0.83 lakh and ₹0.54 lakh respectively

required approval. The rent of ₹46.21 lakh paid upto July 2007 was therefore irregular.

In the meantime CSIR allocated (May 2006) a space of 14,000 sq. ft. to IGIB at its Naraina campus. IGIB, however, did not vacate the rented space and instead, allotted (July 2007) 3,500 sq.ft of its allotted space at Naraina to IMM without obtaining the approval of CSIR.

CSIR stated (April 2010) that if the space was not hired for the super computer, Government would have to bear the depreciation on the equipment without its utilisation. It further added that on getting allocation of space at Naraina, IGIB stopped payment of rent to IMM.

The reply is not acceptable, as IGIB did not have power to allocate government space to private party without approval of CSIR.

4.1.6.5 Installation of equipment in excess of sanction

As per sanction of DST (May 2006), Government share in TCGA project was ₹13 crore for equipment. Out of this amount, DST, CSIR and IGIB were to share ₹8.25 crore, ₹2.72 crore and ₹2.03 crore respectively. DST released ₹8.10 crore against its share of ₹8.25 crore while CSIR and IGIB released their full share of ₹2.72 crore and ₹2.03 crore respectively. Against the available funds of ₹12.85 crore, IGIB installed equipment worth ₹12.44 lakh at TCGA.

In addition to the above, IGIB installed equipment worth ₹2.68 crore procured for its other projects, for commercial use of TCGA. Another set of equipment worth ₹1.16 crore were also placed at the disposal of TCGA for training purposes. Thus, against the sanctioned cost of ₹13 crore for procurement of equipment, IGIB placed equipment worth ₹16.28 crore at TCGA.

CSIR stated in April 2010 that the excess equipment installed at TCGA were in terms of the agreement. The reply of CSIR did not address the issue of additional expenditure of ₹3.28 crore incurred on the equipment.

4.1.6.6 Irregular booking of expenditure not related to TCGA activities

(a) To promote its own business activities, IMM allocated (October 2008) a built-up space of 500 sq.ft at third floor of the Okhla premises (same premises as discussed in para 4.1.6.3) to its Genomic Discovery Project Group

and charged the expenditure amounting to ₹15.76 lakh⁶³ relating to rent and electricity for the period October 2008 to August 2011 to TCGA.

(b) During 2006-07, manpower and chemicals of TCGA worth ₹41.52 lakh were utilised by IMM for its own projects, but TCGA did not recover the same from IMM.

TCGA, while accepting (March 2011) the above audit observations, assured that the expenditure not related to TCGA activities would be reversed, but as of March 2012, no action was taken.

Thus, an expenditure of ₹57.28 lakh was irregularly spent by IMM from TCGA funds.

4.1.6.7 Undercharging of service charges

IMM undertook a project titled Cholera-Typhoid Vaccine Research (CTVR) in 2005-06 in collaboration with Research Triangle Institute, USA (RTI) and carried out genotyping, sequencing and oligo nucleotide synthesis services under the project through TCGA.

The rates for genotyping service as fixed by the Monitoring Committee (MC) of TCGA for 2004-05 to 2008-09 was ₹35 to ₹50 per sample for IMM. However, IMM credited TCGA at ₹23 per sample for 21.97 lakh samples during the years 2006-07 and 2007-08, which resulted in loss of income of ₹88.36 lakh and ₹1.75 crore respectively to TCGA.

CSIR stated (April 2010) that the price realized from CTVR project was higher than the average price realised from all other customers. The reply is not acceptable as TCGA did not charge IMM according to the rates fixed by its MC. Further the average price realised from other customers included IGIB and CSIR institutions, which were being charged at cost price and reduced rates respectively.

4.1.6.8 Uneconomic pricing of services resulting in loss of revenue

During the period 2006-12, TCGA rendered 58 services under six major categories⁶⁴. Audit observed that in two out of the six categories of services, costing was not done economically. The actual cost of chemicals and consumables used in the services were higher than the charges fixed for the services. The uneconomic pricing resulted in loss of revenue, as discussed below:

⁶³ ₹14.16 lakh as rent and ₹1.60 lakh as electricity charges

⁶⁴ Oligo synthesis, Proteomics, Genotyping, Micro array, Sequencing and Custom services

(a) Affymetrix genotyping services: As per the sales registers, TCGA rendered affymetrix genotyping services for testing 130 samples during 2006-09 and earned revenue of ₹34.01 lakh (No such service was provided during 2004-06). However, it was seen from the consumption vouchers that the expenditure incurred on account of the chemicals and consumables used in these services during the two years (2007-08 and 2008-09) was ₹34.34 lakh.

Further, scrutiny of the sales register for the years 2009-11 revealed that no affymetrix services were provided by TCGA during these years, however, the consumption register of chemicals and consumables disclosed ₹3.71 lakh as expenditure incurred on affymetrix services.

(b) Microarray services: TCGA provided microarray services of 17 types at a price ranging widely from ₹280 to ₹29,400. Costing was done for the said service in 2006-07 considering total direct cost⁶⁵ as 50 *per cent* of total sale. Audit however observed from the sales registers of TCGA for 2006-09 that microarray services provided for testing of 484 samples earned revenue of ₹40.90 lakh whereas direct expenditure on chemicals and consumables was ₹34.24 lakh.

Thus, direct expenditure was actually 84 *per cent* against estimated direct cost of 50 *per cent*, making the service unviable.

CSIR did not offer any comments on audit observation on costing of affymetrix genotyping services. Regarding microarray services, it stated that the price of the services was fixed at a lower rate to make it competitive with other cost-effective technologies to promote the technology. The reply of CSIR was not convincing as it overlooks the fact that the services even at competitive rates need to be sustainable in terms of pricing.

4.1.6.9 Benefits derived from the use of IGIB equipment

In terms of guidelines⁶⁶ of CSIR, for allowing use of any CSIR equipment/facility to any private party, each institute should enter into an agreement with the private party after obtaining approval of the Director General, CSIR. The user charges should be worked out and maximum percentage of the same obtained as advance on or before signing the agreement.

(a) IGIB procured a bench-top system for genetic analysis applications (Illumina) in September 2006 at cost of ₹2.48 crore. Audit observed that TCGA used the Illumina equipment for 39 days during 2008-09 without

⁶⁵ including chemicals and consumables, manpower and cost of equipment

⁶⁶ Office Memorandum (March 2002) regarding scheme for permitting use of CSIR equipment/ facilities/ Lab space and manpower by industry.

making any payment towards usage charge. When this was pointed out by Audit, the Monitoring Committee of IGIB fixed (February 2010) the rate of ₹0.53 lakh per day for utilising the equipment and amount of ₹20.67 lakh was paid to IGIB in two installments by TCGA.

(b) IGIB procured a High Performance Bio-computing Facility (Super computer) in September 2005 at a cost of ₹10.71 crore. It was installed in December 2005 at TCGA's premises at Okhla (as discussed in para 4.1.6.4).

Audit scrutiny revealed that out of the total 228-node cluster available in the super computer, IGIB issued authorisation for 61 ID numbers. One ID was also issued to TCGA, which could be logged in by many users. However, while issuing the said ID to TCGA, IGIB did not realise any user charges.

CSIR stated (April 2010) that TCGA did not carry out any commercial activity by using ID number for super computer. The reply of CSIR is not acceptable as allowing utilisation of supercomputing facility to TCGA without any user charges was in violation of CSIR's guidelines.

4.1.7 Poor business practices leading to bad debts

₹52.88 lakh were written off from TCGA accounts during 2006-07, 2009-10 and 2010-11. This write-off was carried out without the approval of Advisory Committee/Monitoring Group of TCGA. Analysis of reasons for these write off revealed that these services were provided without obtaining purchase orders or due to supply of incomplete data/results to the client, non-availability of relevant records with TCGA, etc.

For instance, TCGA provided services for a project of the Defence Institute of Physiology and Allied Sciences (DIPAS), New Delhi received from National Facility for Biochemicals and Genomic Resources (NFBGR)⁶⁷ during 2010-11. Work on the project was completed in March 2011 at a total charge of ₹37.85 lakh and the result data was delivered. However, it was observed that no purchase order was available for the work undertaken and the value had not been realised by TCGA till March 2012.

4.1.8 Lack of adequate monitoring

Monitoring of activities during operation and execution is necessary for successful implementation of any project. In terms of agreement, an Advisory Council (AC) consisting of a committee of seven members headed by Director, IGIB or an eminent scientist was to be constituted for TCGA to guide its mission and future vision, goals, targets, direction, etc. IMM was to

⁶⁷ a resource center for biological and genomic resources under IGIB

run and operate TCGA as per the policy framework and guidelines laid down by the AC. AC was to be assisted by a Monitoring Group (MG) consisting of scientific, technical and commercial advisors and chaired by CEO, TCGA. MG was to review all operational issues of TCGA. Audit observed that:

- No frequency was fixed for holding of meetings of AC and MG. The meeting of AC was held only once in January 2006 during 2004-11. In January 2007, IMM approached IGIB for holding further meeting, but the same was not held. The reasons for not holding the meeting were not on record. The meeting of MG was held only once during 2004-11.
- In July 2007, MG constituted a Project Monitoring Committee (PMC) with members drawn from diverse expertise and knowledgebase for providing scientific inputs and directions, but said committee did not meet even once during July 2007 to March 2009.
- During 2009-11, five meetings of PMC were held. The action taken report in respect of the decisions taken in the previous meetings were not prepared and placed before the successive meetings. In the absence of action taken reports of earlier decisions, holding of subsequent PMC meetings was ineffective.
- No guidelines were issued by AC to IMM for operating TCGA. Further, no physical or financial targets were fixed by AC for TCGA.
- AC/MG failed to monitor decisions taken for operation of TCGA, which adversely affected its financial position, such as appointment of TCGD as project manager for the TCGA building (para 4.1.6.2), irregular renewal of rent agreement (para 4.1.6.3), uneconomic pricing of services of TCGA (para 4.1.6.8), etc.

Thus, the monitoring and evaluation of TCGA was inadequate.

Accepting the audit observation, CSIR stated (April 2010) that MG of TCGA had been expanded to include financial experts of IMM as well as CSIR/IGIB. It further stated that the first meeting of the MG was held in February 2010 and competent authority was being approached to recreate the AC under chairmanship of Director, IGIB.

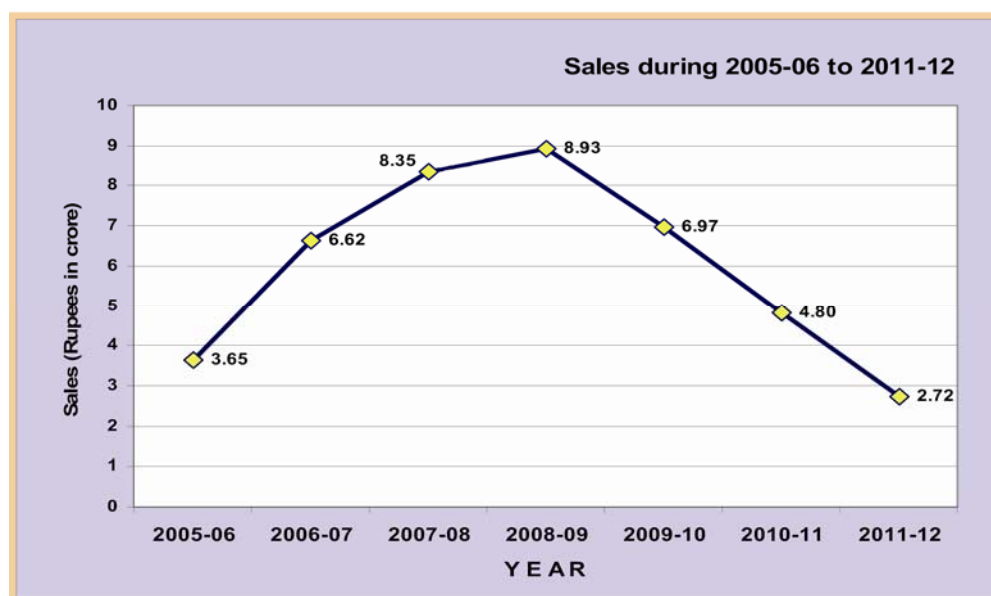
4.1.9 Failure of TCGA as a leading national facility

As stated in para 4.1.1, the TCGA was created with the objective of enabling large number of small laboratories to take advantage of its innovative facilities, making new discoveries in the post-genomic sequencing era and operating it as a national facility and as a shared resource for use by

universities, industry and laboratory groups. Audit observed that TCGA failed to achieve the said objective. The detailed audit observations in this regard are as under:-

4.1.9.1 TCGA reassessed the biotechnological products/ services market in 2005-06 at ₹100 crore and estimated TCGA's share to be 25 *per cent* i.e ₹25 crore. However, TCGA could provide services ranging from ₹3.65 crore to ₹8.93 crore only during 2005-06 to 2011-12 (i.e. upto February 2012) as compared to the estimated target of ₹25 crore per year.

Chart 6- Market share of TCGA from 2005-06 to 2011-12



The average market share of TCGA was only six *per cent* as against the envisaged 25 *per cent* during the period of review. Further, there was continuously decreasing trend in the sale/services from ₹8.93 crore in 2008-09 to ₹4.80 crore in 2010-11, which further reduced to ₹2.72 crore during 2011-12.

4.1.9.2 In terms of the number of samples analysed, it was observed that the share of users other than IGIB/CSIR institutions and IMM was significantly low at 2.85 *per cent* during 2004-09, which further decreased to 1.64 *per cent* during 2010-11. During 2009-11, IGIB's share alone was 92.39 *per cent* of the total samples analysed.

Thus, the major portion of services of TCGA was confined to IGIB only and the objective to develop and operate the facility as national facility with large number of laboratories using the facilities remained largely unachieved.

CSIR admitted (April 2010) that profitability of TCGA could have increased if it was used as a national resource.

4.1.10 Conclusion

IGIB did not undertake due diligence in the process of selecting the partner for engaging in the public-private partnership for setting up TCGA. It selected the partner without waiting for the assessment report of the consultant hired by it to conduct industry analysis of laboratory products and services in the area of genomics and proteomics. The agreement drawn up with Institute of Molecular Medicine (IMM), the private partner favoured the latter and did not have adequate provisions for safeguarding interests of the Government.

IGIB extended benefits to the private partner by allotting government space to IMM without obtaining CSIR's approval and failing to realise user charges from the private partner for use of equipment belonging to IGIB.

Although equipment costing ₹16.28 crore were installed, TCGA could not achieve self-sufficiency, as envisaged. Its average market share remained at 6 *per cent* as against the projected 25 *per cent* of market share, with limited clientele mainly comprising of CSIR, IGIB and IMM and not many private players as envisioned. The pricing policy for its services was uneconomical and services to IMM were given below the prescribed rates. Poor business practices and extending undue benefits to the private partner by booking expenditure not relating to TCGA activities in its accounts also impacted the financial position of TCGA.

The construction of building for TCGA was delayed by more than six years. As a result TCGA incurred expenditure on payment of rent for hired accommodation. In addition, TCGA incurred avoidable expenditure due to payment of excess project management fee, injudicious revision of lease agreement and irregular booking of expenditure on building by IMM.

The monitoring mechanism established for TCGA was lax. No periodicity of meetings of the Advisory Council and Monitoring Group was prescribed. As a result, both the committees met only once during the entire duration of operation of TCGA (2004-11). Advisory Council, which was to lay the policy framework and guidelines for operation of TCGA by the private partner, did not issue the same.

Thus, due to poor planning, imprudent project management and failure to safeguard the interest of government, the objective of TCGA in becoming a national research facility as a shared resource for use by universities, industries and laboratory groups remained largely unachieved.

4.2 Unfruitful expenditure

Central Institute of Mining and Fuel Research, a constituent unit of Council of Scientific and Industrial Research, failed to utilise technology of energy efficient coke oven in development of a demonstration/commercial plant. As a result, expenditure of ₹2.14 crore incurred on the project was rendered unfruitful.

Metallurgical coke is the main input in blast furnace for production of steel. Conventionally, metallurgical coke is produced either from by-product coke oven or from the non-recovery type beehive ovens. While the by-product coke oven is highly capital intensive with a high operational maintenance and unsatisfactory annual return, the non-recovery type coke oven is a low cost and technologically simpler alternative, but part of coal also burns off in the process.

With a view to develop a new coke oven incorporating the advantages of both types of ovens, Government of India, Ministry of Coal sanctioned (August 2003) a project titled 'Development of cheap energy efficient by-product coke oven for the production of hard coke for steel/metallurgical use', at a cost of ₹2.87 crore to Central Mine Planning and Design Institute Limited⁶⁸ (CMPDIL) with Central Institute of Mining and Fuel Research, Dhanbad (CIMFR)⁶⁹ as implementing agency, with project duration of two years. The objective was to design and develop a semi by-product coke oven utilising potentials of beehive coke oven to make it cheap and energy efficient. The concept was subsequently to be utilised in development of a demonstration/commercial scale plant to be constructed at the premises of coal producing organisation.

The project was to be implemented in two phases. The first phase comprised of pilot scale studies followed by construction of demonstration/commercial scale plants at the premises of coal producing organisation in second phase.

Although the project was to be completed by October 2005, it was extended upto December 2008 due to delay in procurement of capital equipment. Expenditure of ₹2.14 crore was incurred on the project.

The project completion report submitted by CIMFR (May 2009) mentioned that the objectives of the project were fulfilled in general, although a more extensive work-out on the oven design was necessary for better performance of oven. It was also stated that the knowledge of present study would be

⁶⁸ A Schedule B-Company and fully owned subsidiary of Coal India Limited.

⁶⁹ Formerly known as Central Fuel Research Institute, a constituent unit of Council of Scientific and Industrial Research (CSIR).

utilised for construction of demonstration/commercial scale plant for coal/coke producing organisation.

However, actual application of the developed concept for efficient and cheap production of coke was not found on record.

The issue of usefulness of expenditure already incurred on project was first raised in audit during December 2009. CIMFR stated (December 2009) that operating the coke oven for prolonged period required minor modifications in the project which could be feasible after getting a fresh project. However, CIMFR took no follow up action to submit a fresh project proposal to the Government, nor undertook the activities under Phase II of the project. Audit further observed that CIMFR did not involve the user industry either at the time of initiation of the project or at any other stage during its implementation.

Upon further pursuit of the issue, CIMFR stated (May 2012) that it was not approached by any user industries for utilising the concept in the development of demonstration/commercial plant. CIMFR added (March 2013) that a workshop on coal carbonisation was conducted (March 2011) for the senior executives of Steel Authority of India Ltd. but no response was received as of March 2013.

CSIR stated (March 2013) that it was assumed that after completion of the project it would be warmly accepted by the coke producing industries, however no proposal was received from end users for setting up of such commercial plant.

Thus coke oven developed by CIMFR did not find use in the industry even after more than four years of its development, thereby rendering the expenditure of ₹2.14 crore incurred on the project unfruitful.

CHAPTER – V

Department of Science and Technology

5.1 Avoidable expenditure on hiring of office premises

Science and Engineering Research Board (SERB) failed to occupy the premises hired from a private agency, for its office for 22 months and incurred avoidable expenditure of ₹8.84 crore towards rent.

Science and Engineering Research Board (SERB) was created by an act of Parliament (January 2009) for promoting basic research in Science and Engineering and to provide financial assistance to persons/institutions engaged in such research. While addressing (January 2010) the Indian Science Congress, Prime Minister had announced that the Board shall become operational by March 2010.

The office and other accommodation for the Board were to be provided on the land allotted to Department of Science and Technology (DST) at Noida. However, as this was expected to take about five years, DST decided (July 2009) to provide alternative accommodation to SERB by hiring built-up space from market.

After three rounds of tendering, SERB finalised (November 2010) an area of 15,953 sq. ft. on the lower ground floor of 'Vasant Square Mall' for its office. As per the conditions of acceptance letter (November 2010), the lessor would provide building in a ready to move condition with all electrical, sewer and other civil amenities available on the date of signing of lease deed. SERB entered into a lease agreement (February 2011) with Suncity Projects Pvt. Ltd. (lessor) for a period of three years at monthly rent of ₹41.09 lakh including maintenance charges and taxes.

SERB entrusted (February 2011) the interior work of the office to National Mission for Bamboo Applications (NMBA), a division of DST, at a cost of ₹1.67 crore to be completed within one month. The interior work was completed by NMBA in December 2011. However, SERB did not occupy the office premises until December 2012 i.e after about 22 months of commencement of rent payment and 12 months of completion of interior works. During the period from February 2011 to November 2012, DST/SERB made a total payment of ₹8.84 crore to the lessor towards rent for the hired office space.

Besides, idle investment of ₹1.67 crore was also incurred on interior works at rented premises.

Audit observed that SERB did not have its own staff and its work was being looked after by DST officers/scientists on dual capacity basis. The Recruitment Rules of SERB were also not notified (May 2013) and out of 24 sanctioned posts, only the post of Director was filled-up (June 2012).

Thus, in spite of the non-existence of regular staff of its own, SERB hired office space and incurred substantial expenditure towards rent.

SERB stated (November 2012) that the furnishing work along with other infrastructure necessary to run an office took more than expected time. SERB added that in the absence of Recruitment Rules, the SERB projects and other related works were executed by the scientists of DST in dual capacity.

The reply of SERB is not acceptable, as the decision to hire office space when hiring of regular staff would not be imminent due to absence of Recruitment Rules of the organisation, was imprudent. Besides, though the premises were ready by December 2011, SERB delayed in occupying the same by one year, until December 2012.

DST justified the delays on account of various reasons and stated (June 2013) that SERB's hired accommodation was being utilised from December 2012 onwards.

Thus, lack of planning and injudicious decision to hire office accommodation in the absence of regular staff and failure to occupy the same resulted in avoidable expenditure of ₹8.84 crore towards lease rent and idle investment on interior work to the extent of ₹1.67 crore.

5.2 Inadmissible payment of Transport Allowance

Jawaharlal Nehru Centre for Advanced Scientific Research irregularly paid transport allowance of ₹69.93 lakh to its employees who were utilising Institute's transport facility.

Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru (JNCASR) was established as a deemed university in 1989 with mandate to promote scientific research and training.

As per Government of India, Ministry of Finance (MoF) orders dated 29 August 2008, transport allowance shall not be admissible to those employees who have been provided with Government transport. Further, as per Fundamental Rule 44, the amount of compensatory allowance should be so

fixed that the allowance is not on the whole a source of profit to the recipient.

Audit scrutiny of the records of JNCASR for the period from September 2008 to February 2013 revealed that 62 employees were getting transport allowance in addition to using the transport service facility that was provided for students and research staff, on payment of nominal amount ranging from ₹75 to ₹350 per month. It paid transport allowance of ₹69.93 lakh to these employees during September 2008 to February 2013.

JNCASR stated (August 2012) that the transport services were meant for the research staff who were not in receipt of transport allowance and the staff who were in receipt of the transport allowance were made to pay for the usage of the transport services and this also helped in utilising the idle capacity.

Audit feels simultaneous granting of transport allowance and utilising JNCASR's transport facilities at nominal rates was in violation of government instructions. Audit further observed that prior to the implementation of the recommendations of the Sixth CPC, JNCASR had been providing the transport services meant for the research staff to its employees without payment of transport allowance. The contention of JNCASR is, therefore, not acceptable.

The matter was referred to DST in October 2012, however reply was not received as of July 2013.



CHAPTER – VI

Ministry of Environment and Forests

6.1 Repeated unauthorised creation and up-gradation of posts by Central Pollution Control Board

Central Pollution Control Board (CPCB), an autonomous institution under the Ministry of Environment and Forests (MoEF), created and upgraded posts in violation of orders of Ministry of Finance, did not comply with guidelines on ad-hoc appointments and incurred a recurring financial burden of more than ₹3.22 crore per annum on the exchequer. The repeated breach of delegation of powers by CPCB indicates the lack of control and monitoring by MoEF over the units under its administrative jurisdiction.

Rule 8 of 'The Water (Prevention and Control of Pollution) Rules', 1975 conferred the power upon Central Pollution Control Board (CPCB), an autonomous body under the Ministry of Environment and Forests (MoEF), to create posts, upto the maximum of the pay scale of ₹1600⁷⁰ (Third Pay Commission). Thereafter, Ministry of Finance (MoF) issued various instructions from time to time, regulating creation and up-gradation of Plan and Non-Plan posts in Ministries/Departments. Through its orders of March 1994, MoF withdrew the powers of creation of Plan posts from Ministries/Departments in the case of all Group 'B', 'C' and 'D' posts, including non-scientific posts.

Audit observed numerous violations by CPCB in the creation and up-gradation of posts and in cases relating to ad-hoc appointments and promotions, which are illustrated in the table below:

Table 10- Details of posts created and upgraded by CPCB

Sl. No.	Nature of violation	Period during which these posts were created	Number of posts	Annual financial implication
1.	Posts created without approval of MoF	(a) December 1994 to January 2009	62 posts (Group: A-2, B-40, C-10 and D-10)	₹146.66 lakh ⁷¹

⁷⁰ Falls under Pay Band 3 as per recommendations of the Sixth Pay Commission

⁷¹ Calculated on Basic Pay (minimum) as per Sixth Pay Commission plus 65 per cent Dearness Allowance

MoEF replied (February 2010) that exemption from the ban of Scientific posts in Scientific Departments was given by MoF in February 1988.

The reply is not acceptable as all these 62 posts were non-scientific and were in violation of orders issued by MoF in March 1994 which withdrew powers of creation of posts from Ministries/Departments in the case of all non-scientific posts.

	(b) September 1994 to June 2003	55 posts (Group: B-30 and C-25)	₹ 83.92 lakh ⁷²
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MoEF replied (February 2010) that (i) 28 posts in the non-scientific category which were created by the CPCB before September 2000 and (ii) 27 scientific posts were regularised by MoEF with the approval of the Secretary (Environment & Forests) in January 2008. MoEF further added that there was a view that CPCB was competent to create all these posts in exercise of the powers conferred upon it under Rule 8 of 'The Water (Prevention & Control of Pollution) Rules', 1975.

The reply is not acceptable as neither MoEF nor CPCB were empowered to create 28 non-scientific posts in view of the instructions issued by MoF in March 1994. Further, 27 posts regularised as scientific posts were not scientific in nature.

Sl. No.	Nature of Violation	Period during which these posts were created	Number of posts	Annual financial implication
2.	Temporary posts created but not abolished	March 1996	10 posts (Two Director level and eight Additional Director level)	₹91.36 lakh ⁷³

MoEF stated (December 2011) that these posts have been converted into permanent (Non-Plan) posts in terms of a regulation of 11 January 2010.

The reply of the Ministry is not pertinent to the case as the above-mentioned regulation deals with the method of re-framing terms and conditions for service of Group 'A' officers and does not deal with the issue of conversion of temporary posts to permanent posts.

⁷² As per information provided by CPCB

⁷³ Calculated on Basic Pay (minimum) as per Sixth Pay Commission plus 65 per cent Dearness Allowance

Sl. No.	Nature of violation	Period during which these posts were upgraded	Number of posts	Annual financial implication
3.	Irregular up-gradation of posts	July 1996 to December 2006 ⁷⁴	47 posts ⁷⁵	@

MoEF stated (February 2010) that there was a view that CPCB was competent to create/upgrade all these posts in exercise of the powers conferred upon it under Rule 8 of the 'Water (Prevention & Control of Pollution) Rules' 1975. Moreover, approval of MoEF had been accorded for conversion of 16 posts. MoEF further intimated (December 2011) that (i) up-gradation of 10 posts had been withdrawn, (ii) the proposal for up-gradation of two posts had been referred to MoEF, and (iii) for the remaining 19 posts though the up-gradation was done without prior approval of MoF, it was ensured that there were matching savings.

The reply of MoEF is not acceptable as up-gradation of a post in effect amounts to creation of a post and all creation of posts required approval of MoF as stipulated in its order issued in March 1994.

4.	Irregular continuance of ad-hoc appointments and promotions without approval of DoPT	March 1996 to January 2009	35 posts	Ω
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MoEF stated (December 2011) that at present only 20 employees were on ad-hoc basis. Further, since 2009, no ad-hoc appointment had been made and in future, no ad-hoc promotion would be made which was not in accordance with the guidelines/instructions of the Central Government.

The reply of MoEF was, however, silent about the regularisation of the unauthorised period of operation of these posts.

@ Annual financial implications could not be worked out in the absence of detailed information from CPCB

Ω Annual financial implication has not been worked out as the annual financial implication in ad-hoc posts/promotions is not recurring and is only up to the period indicated

⁷⁴ The period of up-gradation of 29 posts not available

⁷⁵ CPCB unauthorisedly continued to operate two posts of Accounts Officer in the upgraded scale of ₹10,000-15,200 even though MoEF had requested CPCB to fix responsibility for not following its advice since 1995. In December 2011, the CPCB replied that it had withdrawn the up-gradation of these two posts of Accounts Officer with effect from 1 October 2009, but the reply was silent about regularisation of these posts. MoEF also approved up-gradation of 16 posts in May 2008 without concurrence of MoF.

It is evident that CPCB, in the last 15 years, repeatedly violated instructions for creation/up-gradation of posts in various cadres. It created 127 posts and upgraded 47 posts without the approval of MoF. MoEF unauthorisedly approved up-gradation of 16 posts in May 2008 without the concurrence of MoF. CPCB also violated guidelines issued by the Department of Personnel And Training (DoPT) for ad-hoc appointments/promotions in 35 cases. The creation and up-gradation of posts resulted in extra burden on the exchequer to the extent of over ₹3.22 crore per annum.

In October 2008, the Ministry of Finance, while regularising 32 posts in CPCB on ex-post-facto basis, advised that the bye-laws of CPCB needed to be amended as they clearly ran contrary to instructions issued by MoF. Consequently MoEF by its order of 9 November 2011 took a decision to abrogate Rule 8 of The Water (Prevention and Control of Pollution) Rules, 1975.

The repeated breach of delegation of powers by CPCB indicates the lack of control and monitoring by MoEF over the units under its administrative jurisdiction.

CHAPTER – VII

Ministry of Water Resources

7.1 Maintenance of Farakka Barrage and its ancillaries

Maintenance of the Farakka Barrage constructed by Government of India during the 1970s was inadequate. Consequently, there were major gate failures on six occasions from 1985 to 2011, major systems such as remote control systems for the gates and navigational lock of the barrage remained inoperative for nearly three decades. The project management did not have enough spare gates as prescribed by the Central Water Commission norms. Bed protection works and maintenance works on the feeder canal were not undertaken. No action for preventive maintenance of the barrage structures was taken.

7.1.1 Introduction

7.1.1.1 Government of India commissioned a barrage on the river Ganga at Farakka in West Bengal in 1974. The river splits into Bhagirathi-Hooghly on the right (south) and Padma on the left (west) that enters Bangladesh 20 km downstream from Farakka barrage. For the next 90 km flowing south-west, Padma is treated as the Indo-Bangladesh boundary.



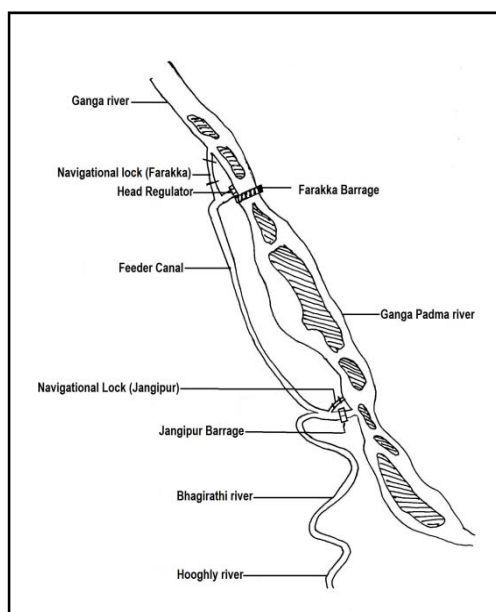
The main objective of the Farakka barrage was to regulate the flow of water to the Bhagirathi-Hooghly through the feeder canal to maintain navigability of the Kolkata Port. The barrage was also meant to facilitate river transport in the National Waterway No.1 between Allahabad and Kolkata (Haldia) Port and plays an important role in providing water supply to Kolkata, its surroundings and to the 2000 MW thermal power plant at Farakka.

The barrage along with its ancillary structures was constructed at an approximate cost of ₹156 crore and commissioned in 1974. The barrage comprises of the following three main structures:

a) Main barrage: The main barrage on the river Ganga at Farakka regulates the flow of water from India to Bangladesh. It is 2245 m long and has 112 gates. It was designed for maximum discharge of 27 lakh cusecs.

b) Head regulator: It is constructed at the origin of the feeder canal to regulate the inflow of water into the river Bhagirathi-Hooghly through a feeder canal from the river Ganga.

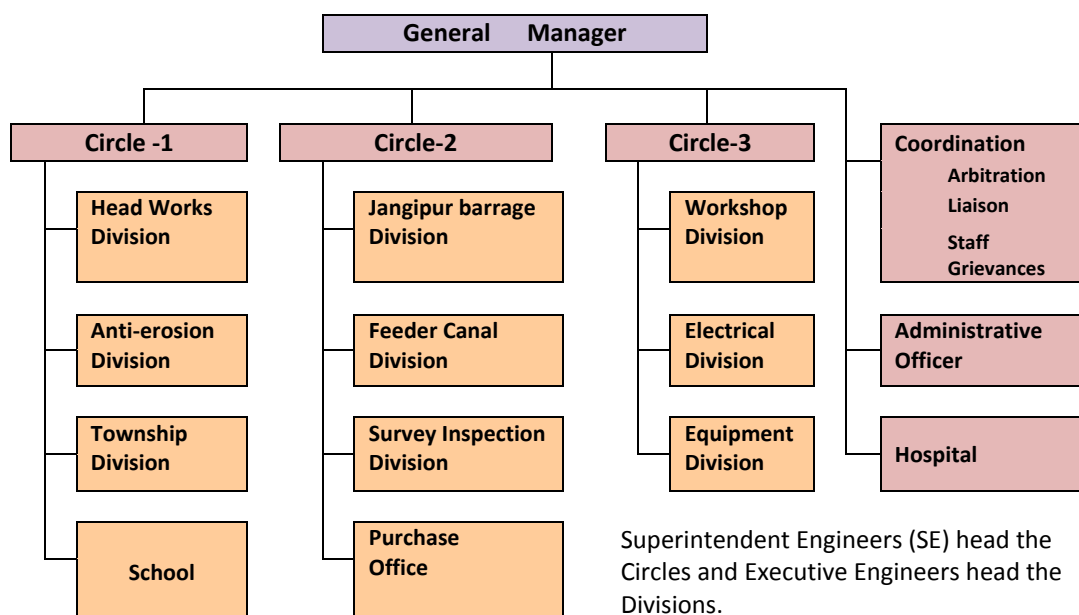
c) Jangipur barrage: Jangipur barrage was constructed at the off take point of the Bhagirathi-Hooghly to regulate flow of water from the Ganga and vice versa. A 38.38 km long feeder canal connects Bhagirathi-Hooghly and Ganga.



There is a pair of railway tracks and pre-reinforced concrete road bridge on the downside running parallel to the main barrage. They serve as the direct surface communication link between the south and north in West Bengal and thereafter the north-eastern part of India.

7.1.1.2 The operation and maintenance of the Farakka Barrage Project (FBP) is entrusted to the Farakka Barrage Authority (FBA) under the Ministry of Water Resources (MoWR), Government of India (GOI). The General Manager is the Chief Executive Officer of the FBP and is responsible for operations and maintenance. He is assisted by four Superintending Engineers who in turn are assisted by Executive, Assistant and Junior Engineers and

other support staff. Total manpower at the end of March 2012 was 1,259. The organisational chart of the FBP is given below. The Central Water Commission (CWC), an attached office of MoWR provides overall guidance through Technical Advisory Committee (TAC), Gate Regulation Committee (GRC) and Canal Study Group (CSG).



7.1.1.3 The budget allocation and actual expenditure during the last six years is shown below.

(₹in crore)

Table 11- Budget allocation and Expenditure

Year	Budget allocation		Actual expenditure		Total Expenditure
	Plan	Non-Plan	Plan	Non-Plan	
2006-07	61.00	23.67	58.74	24.29	83.03
2007-08	33.00	24.99	31.45	24.41	55.86
2008-09	76.61	27.95	54.03	32.57	86.60
2009-10	70.00	39.45	68.93	39.65	108.58
2010-11	82.00	40.63	43.99	41.59	85.58
2011-12	71.40	42.80	69.46	41.81	111.27
Total	394.01	199.49	326.60	204.32	530.92

7.1.1.4 Audit commenced in June 2011 and the audit objectives and the scope of audit were explained to the management of FBP. The audit was completed in March 2012 and discussed with the management of the FBP in July 2012. The audit of the FBP was conducted with a view to see whether maintenance of barrages and its ancillaries and navigation channels was being carried out economically and efficiently and whether utilisation of funds for maintenance was commensurate with the budget allocation.

7.1.2 Maintenance of main barrage, head regulator and Jangipur barrage

The Head Works Division-I (HWD-I) of the FBP is responsible for operation and maintenance of the Main Barrage and Head Regulator, while the Jangipur Barrage Division (JBD) is responsible for the Jangipur Barrage. The job of HWD-I and JBD inter alia includes maintenance of:

- (i) gates,
- (ii) control systems,
- (iii) ancillary parts,
- (iv) pre-reinforced concrete road, and
- (v) hydrographic survey and bed protection works.

Audit noticed that the FBP had failed to ensure timely and proper repair and maintenance of the Main Barrage, Head Regulator and Jangipur Barrage. The deficiencies are discussed in the following paragraphs:

7.1.2.1 Gates

(a) Gates in use

Timely repair of the gates is very important. A failure of the gates can lead to uncontrolled discharge of water to the neighbouring country, consequential depletion of Pond level⁷⁶ and less inflow of water to river Bhagirathi through the feeder canal. Further, uncontrolled discharge of water for a considerable time creates deep scours in the river bed adjacent to the barrage, which can damage the barrage structure. On the other hand, reduced discharge to the feeder canal will negatively impact the availability of water for power generation at NTPC⁷⁷, increase the salinity of the water due to reduced flushing out of tidal sea water, thereby endangering ecological balance and also induce scarcity of drinking water downstream of Farakka Barrage.

The main barrage has 112 gates while the Head Regulator has 11 three tier gates. As the gates constantly withstand severe water pressure, it is important that they remain suitably thick. The gates also need to be regularly inspected and tested to detect corrosions and holes, so that necessary corrective measures can be taken in time. As per norms of the CWC and recommendations of the GRC, gates are to be painted at intervals of four to six years⁷⁸ to avoid rusting.

⁷⁶ The level of water at near vicinity of the main barrage in the upstream

⁷⁷ National Thermal Power Corporation

⁷⁸ FBP has no manual of its own and follows CWC's manual.

Audit observed that the FBP did not fix any norms for periodical painting of gates. Further, in spite of several recommendations⁷⁹ of the GRC and TAC, the FBP showed scant regard to these recommendations and the gates of the main barrage were not painted for many years.

Number of gates	Not painted for
69	> 5 years
26	> 15 years
17	> 20 years

Similarly, gates of the Head Regulator and Jangipur Barrage were also not painted for more than 10-15 years.

Audit observed that inadequate repair and maintenance of gates led to gate failures on six occasions from 1985 to 2011, as discussed below:

- (i) Gate number 17 and 74 of the Main Barrage were totally damaged in February 2007 and in June 2008 respectively but were not replaced as of June 2012. Further, FBP identified (January 2010) four other damaged gates⁸⁰ of the Main Barrage for undertaking special repairs. In January 2011, after a lapse of one year, the FBP awarded the work to a firm for ₹47.52 lakh with stipulated time of 180 days (i.e ending on 30 July 2011) for completion of the work. The work was however, yet to be completed as of June 2012 after 30 months from date of identification.
- (ii) There was profuse leakage through the side and bottom rubber seals of most of the gates even though these gates were lowered to the river bed (sills). Some gates could not even be lowered to the sills due to mechanical problem. In two gates, the gap between the sill and the gates was 21-30 inches. This resulted in excess discharge of water to the neighbouring country. Besides, excess discharge of water through the gaps reduced the pond level. In order to maintain the desired pond level of the barrage, water discharge in the feeder canal was restricted thereby affecting the navigability of the Kolkata Port.

The FBP Management stated (July 2012) that the gates were in continuous operation for the last 36 years and had outlived their economical life. As the gates were exposed to extreme natural vagaries, prolonged damages had occurred to the gates and they were due for replacement. Management further stated that a joint inspection with an expert agency (Texmaco) was carried out (July 2011) following which it was concluded that the gates were in dilapidated condition and that an action plan had been formalised for

⁷⁹ Meetings held on December 2005, November 2006 and February 2010 during the course of audit.

⁸⁰ Gate Nos. 14, 15, 90 and 91

replacement of the gates in a phased manner during the Twelfth Five Year Plan (FYP) period (2012-2017).

(b) Spare gates

As per the CWC guidelines, 10 *per cent* of the total gates are required to be kept as spare gates for replacement in case of emergency. Accordingly, 11 gates for the Main Barrage, three gates for the Head Regulator and two gates for the Jangipur Barrage should be kept as spare. Against this, there were only three spare gates for the Main Barrage and no spare gate for the Head Regulator and Jangipur Barrage.

Expenditure Finance Committee (EFC) during XI FYP proposed for procurement of four spare gates at a cost of ₹2.60 crore. Audit scrutiny, however, revealed that FBP did not procure any spare gate during the Plan period. Inaction of FBP to procure adequate spare gates may lead to significant reduction in disaster management capacity of the barrage.

The FBP Management stated (July 2011) that keeping 10 *per cent* spare gates was not techno-economically viable. A spare of three to four gates was sufficient to meet emergent situations as by the time the spare gates are erected, additional gates could be fabricated. Moreover to meet any exigency, sufficient stop logs were kept available.

The reply contradicts the existing norm set by CWC for keeping a minimum 10 *per cent* of spare gates as reserve for emergency, as also the fact that the procurement of four spare gates was approved by the EFC during XI FYP.

7.1.2.2 Control System

(a) Remote Control System

The gates of the Main Barrage were designed for remote control operation of all gates from a single point (Remote Control Desk), because sometimes 30 to 35 gates are required to be operated simultaneously. Manual operation of gates during rain and storm and at night is difficult and beset by the possibility of human errors.

Audit noted that the remote control system was out of



order since 1985. The existing operating system of Farakka Barrage had also become obsolete, resulting in errors in operation of the gates. In order to remedy the situation FBP carried out consultations (between 1990 and 2003) with two agencies viz., Central Water Power Research Station, Pune (CWPRS) and Electronics Research and Development Corporation of India, Kolkata (ER&DCI) for rectification of the system. Both agencies suggested replacement of the system with a new system with latest technology. The TAC, however, declined (99th Meeting in 2003) the proposal as it would entail huge cost and recommended rectification instead. The projected cost of replacement suggested by the consultants or worked out by the FBP was not found on record. However, the TAC decided (101st Meeting in 2005) to opt for up-gradation as no agency was found for undertaking rectification as earlier recommended by TAC.

Though the EFC provided ₹1.50 crore during Eleventh FYP Period (2007-2012) for completing the first phase of installation of the new operating system, no work was done till April 2012. Consequently, the gates continued to be operated without the remote control system for more than 25 years and no action for rectification/up-gradation of the existing system was initiated in over 20 years since the first consultation was undertaken for the purpose.

(b) Local Control System

In addition to the remote control system, local control system (electrical and manual) is provided on the gates for operation of the gates. The local control system comprises of Electrical Control Panels and Sub-Distribution boxes and in case of malfunctioning of the electrical system the gates are operated manually.



Audit observed that the local system remained intermittently inoperative due to poor maintenance work which consequently led to frequent manual operation of the gates.

FBP Management stated (July 2011) that replacement of the remote control system would be undertaken only after all the gates were replaced because phased replacement of remote control system would be technologically problematic and cost ineffective. Regarding local control system Management stated that efforts to repair the system were futile and as the

system had outlived its useful life, action for its replacement along with the respective gates had been initiated.

7.1.2.3 Hoist ropes

The heavy gates⁸¹ of the barrage are suspended to the hoists by steel ropes. As the hoists have to bear such heavy loads, it is necessary to undertake periodical check-up to detect deterioration of the ropes, so as to avoid any untoward incident. The GRC recommended (January and December 2005) the inspection of the wire ropes by an expert agency to work out the schedule for repair/replacement.

FBP informed (January 2006) TAC that the work would be completed within March 2006. FBP approached (September 2008) Central Institute of Mining and Fuel Research, Dhanbad (CIMFR) for conducting a non-destructive testing of the hoist ropes and it was decided by the TAC that action for replacement of the ropes would be taken on the basis of its report.



There was no further development in this regard as of June 2012 even though the EFC had provided ₹ one crore for replacement of hoist ropes and stay wires during the XI FYP period (2007-2012) on account of deterioration through prolonged use.

It is evident from the above that the FBP paid no heed to the advice of different expert committees (GRC and TAC) for repair and maintenance of the steel ropes. Non-adherence to the experts' advice regarding repair/replacement, coupled with absence of periodical inspection, is fraught with the risk of the gates collapsing and thereby creating an avoidable crisis.

The FBP Management stated (July 2011) that CIMFR could not perform the testing work of hoist ropes as the technology was not commensurate with the operational characteristics of the hoist ropes and stated that as the ropes were in use for more than 35 years, it was decided to replace the hoist ropes also along with the gates, as envisaged in the action plan.

⁸¹ Weight of one steel crest gate is about 29 MT and 39 MT for an under sluice gate.

Reply of the FBP Management corroborates the fact that the hoist ropes along with the gates need immediate replacement in the absence of regular maintenance.

7.1.2.4 Survey and bed protection work

Floods cause scour pockets in the river bed which leads to deviation of contours. Bed protection works like dumping of boulders in crates are necessary to restore these scours and contours. The FBP carries out pond level surveys of the river during the post-flood period at close interval in the reach from 300 meter upstream to 300 meter downstream of the Main Barrage. The GRC recommended (December 2005 and again in November 2006) to dump sand bags and boulders on the contours to save the barrage structures by preventing undermining of the barrage foundation. Further the EFC during the XI FYP mentioned the necessity of undertaking the protection work of flexible apron along with submerged spurs and three damaged bays (16, 17 and 18) and provided ₹7.50 crore. However, the FBP did not spend any amount as of September 2011 thereby compromising on the safety of the entire barrage structure.

7.1.2.5 Navigation Lock

The main components of the navigational lock at Farakka are Mitre Gates, Caisson Gates (Stop Logs), Radial Valve Gates, Bulkhead Gates, Mooring Bits, Control Rooms and Electrical rooms.

Audit observed that the FBP failed to carry out routine maintenance of the different components of the Navigation Lock in spite of having a maintenance manual. Besides, the FBP took no initiative to repair/restore the machinery/equipment lying inoperative



since long. Even the security of the assets was inadequate. The position is detailed in the following paragraphs.

- a) There was displacement in different parts of the gear system of Mitre and Radial valve gates' hoisting devices. Consequently, the gates of the navigation lock had to be operated with great difficulty and there was considerable leakage of water through the rubber seals at most times. As such, the possibility of the gate operating system becoming totally non-functional at any point of time cannot be ruled out.

- b) The remote control system was inoperative since inception and the gates were being operated locally.
- c) Periodical insulation tests of the electrical wirings of hoisting mechanisms of Mitre Gates and Radial Valve Gates, overhead lines of East and West Bank of the lock as well as pumping mechanism, ventilation and physical checking were not carried out.
- d) Most of the electrical operating panels of the Lock Gate at Farakka were operated without any switches, the electrical wirings of the machines and other different structures were in a very bad and unsafe condition and civil structure housing electrical components was dilapidated. Such hazardous conditions might cause a serious accident at any point of time during gate operation.
- e) Caisson Gates (Stop logs), meant for servicing and maintenance of Mitre Gates, were not positioned in proper place in the lock channel and remained non-functional since inception. This resulted in non-maintenance of Mitre gates.



Electrical Panels of the Lock Gate



Caisson Gates

- f) The barbed wire fencing was very old and absent in most of the places. Hence, important parts of locks lying haphazardly inside the lock gate complex were susceptible to damage/theft by miscreants.

FBP Management stated (July 2011) that provisions were made in the XII FYP for repair and maintenance of the navigational lock and its appurtenant structures and efforts were being made for modernisation of the navigational lock.

7.1.2.6 Maintenance of Feeder Canal

The feeder canal has several cross drainage structures for communication, irrigation and removal of drainage congestion. It has 17 jetties for ferry service, two road cum rail bridges and two road bridges.

During the Eleventh FYP (2007-2012), MoWR allotted ₹15.10 crore for “Operation and Maintenance of Feeder Canal” from Farakka Barrage to river Bhagirathi (38 Km). Of this, the FBP could utilise only 4.6 *per cent* (₹0.70 crore) till September 2011. Audit observed that despite specific recommendations by the TAC, FBP did not undertake protection works of the canal, viz. filling up the scour pockets in two reaches with sand filled HDPE⁸² bags, de-silting of Bagmari siphon, bank protection measures and construction of roads and bridges.

The alignment of Feeder Canal intersects various villages, path, roads etc. for which ferry services have been provided to maintain connectivity. With a view to discontinue ferry service at two points⁸³ FBP in February 1974 conceived a project of building road bridges across the feeder canal. Work on the road bridge was awarded (September 1977) to a contractor which was rescinded in January 1988. After a lapse of nearly five years, in October 1992, the rescinded work was awarded to another contractor at a cost of ₹1.07 crore. The bridge was to be completed by November 1994. The contractor completed the civil work in May 2001 after delay of 78 months. The FBP paid the contractor ₹1.27 crore upto 41st running account bill. FBP stopped further payment and the bridge was not taken over due to not conducting mandatory load bearing test by the contractor. The dispute was ultimately resolved (December 2008) by the Supreme Court and as per the order, FBP further paid ₹27.69 lakh to the contractor. Audit observed that FBP failed to prevail upon the contractor to conduct the mandatory load bearing test as of May 2012.

Since the FBP did not use the bridge it continued to operate free ferry service at the two locations across the length of Feeder Canal. During the period from 2006-12 the FBP authority had incurred an expenditure of ₹2.08 crore towards maintenance of free ferry service. Audit scrutiny revealed that apathy of the FBP to construct roads and bridges resulted in avoidable expenditure on free ferry service.

⁸² High Density Polyethylene

⁸³ RD 23 & 34

Recommendation 6:

Concerted efforts may to be taken to adhere to the milestones in the action plan formulated by FBP to meet the objective of replacement of gates and other structures by the end of Twelfth Five Year Plan period.

Recommendation 7:

FBP may identify and fix the responsibility centres, deliverables and deadlines to achieve the above milestones.

7.1.3 Utilisation of funds for maintenance

The following is the break-up of expenditure incurred on salary/ establishment costs, anti-erosion etc. during the last six years:

(₹ in crore)

Table 12 - Break up of expenditure incurred under FBP

Year	Salary/ establishment	Anti-erosion works	Maintenance works	Professional services*	Other activities	Total
2006-07	15.47	34.71	5.58	8.73	18.54	83.03
2007-08	17.39	16.17	3.98	8.98	9.34	55.86
2008-09	24.78	32.11	5.88	11.99	11.84	86.60
2009-10	29.90	44.66	5.61	15.98	12.43	108.58
2010-11	28.01	19.72	6.07	15.00	16.78	85.58
2011-12	30.16	38.33	9.56	15.00	18.22	111.27
Total	145.71	185.70	36.68	75.68	87.15	530.92
Percentage of total expenditure	28%	35%	7%	14%	16%	

* Substantial part of expenditure under professional services was payment to CISF

It is evident that expenditure on maintenance works was only seven *per cent* of the total expenditure, whereas expenditure on anti-erosion works was the highest at 35 *per cent*.

In 2005, responsibility of Farakka for anti-erosion works was extended from 12 km to 40 km upstream and seven km to 80 km downstream of the barrage. The FBP through its four divisions⁸⁴ took up anti-erosion works on a regular basis in the left bank upstream and the right bank downstream of the barrage. An amount of ₹185 crore was incurred on anti-erosion works during 2006-07 to 2011-12 by diverting substantial manpower for these works from

⁸⁴ Anti Erosion Division, Survey & Investigation Division, Feeder Canal Division, Equipment Division

their regular duties. Audit is of the view that it was one of the reasons for neglect of the required maintenance of FBP.

FBP Management stated (July 2011) that higher authorities were requested to fill up large number of vacant posts in Head Works Division. It also stated that a few maintenance works could be implemented through outsourcing.

The reply supports the audit contention that the maintenance of Farakka Barrage was not given priority by the FBP Management.

7.1.4 Inspection by Central Water Commission

The CWC conducted (July 2011) inspection and concluded that most of the gates of main barrage and head regulator were in precarious condition and unless some urgent measures were adopted, their collapse seemed inevitable any time. All the gates were corroded beyond repairs and had lost their design strength to withstand hydro dynamic pressure.

The CWC suggested (July 2011) a comprehensive solution of replacing gates in a phased manner during the XII FYP period (2012-2017). It justified the proposal stating that the gates had already outlived their economic life and any future special repairs could only postpone the disaster in waiting for a couple of years. Therefore instead of tackling the problem in a solitary piecemeal basis it was suggested to go for a comprehensive overhaul i.e., to replace all the gates. It advised the Management to convene TAC meeting at the earliest for consideration and acceptance of this proposal. The TAC met in November 2011 and approved the proposal for replacement of gates and some other structures in phased manner during the XII FYP period.

Audit is of the view that protocol for preventive maintenance vetted by the CWC in June 2012 should have been in place much prior to their inspection. No system existed for periodic inspection and maintenance. No records in the form of log books or registers were maintained. Painting of gates and their special repair jobs awarded to the National Projects Construction Corporation (NPCC) and Jessop in 1996 continued till 2005 but remained unfinished.

The FBP Management offered no comments on the issue.

Recommendation 8:

Management should ensure adherence to protocol for preventive maintenance adopted in June 2012 and ensure availability of adequate Tools and Plants items and instruments, requisite and mandatory spares in the inventory and maintenance of records of inspection.

7.1.5 Conclusion

It was seen that maintenance of the Farakka Barrage and its ancillaries was lax. Several critical structures such as gates, gate operating system, navigational lock etc. were not maintained and repaired, resulting in a situation where some of these structures were in disuse for several years. The FBP Management, CWC and MoWR neglected the inspection and maintenance aspects of the FBP structures for last three decades. Bed protection works to restore the scours and contours in the river bed to save the barrage structures in order to prevent undermining of the barrage foundation were not undertaken. FBP also did not undertake protection works of the feeder canal in spite of the recommendations of the TAC. No action for preventive maintenance of the Barrage structures was taken. The budget allocation of the project was biased in favour of anti-erosion works. Expenditure on maintenance works was only seven *per cent* of the total expenditure, whereas expenditure on anti-erosion works was the highest at 35 *per cent*.

The FBP Management accepted most of the audit observations and stated that action plans had been initiated for repair and replacement of the dilapidated structures in a phased manner during the Twelfth Five Year Plan period (2012-17).

The issues mentioned in the above paragraphs were referred to MoWR in July 2012, however, reply was not received as of July 2013.

CHAPTER – VIII

Ministry of Earth Sciences

8.1 Irregular introduction of pension scheme and diversion of funds

Indian National Centre for Ocean Information Services, Hyderabad, irregularly introduced a pension scheme for its employees in violation of the orders of Ministry of Finance.

Department of Ocean Development, now Ministry of Earth Sciences (MoES), proposed (October 2005) to introduce a pension scheme for the employees recruited prior to 1 January 2004 in the autonomous institutions under its control, which were hitherto following the Contributory Provident Fund (CPF) Scheme. The autonomous institutions were directed to opt for a pension scheme offered by Life Insurance Corporation (LIC) or any of the public sector insurance companies and carry out an actuarial assessment of the fund requirements. After setting off the entire amount of employer's contribution available in the existing CPF scheme under the proposed new scheme, the consolidated requirement of funds for covering the gap between funds available vis-à-vis funds required was to be intimated to Ministry of Finance (MoF) for providing a one-time grant for the purpose.

Indian National Centre for Ocean Information Services, Hyderabad (INCOIS) approached LIC with a proposal to opt for the 'Defined Benefit Scheme' in respect of INCOIS employees who joined on or before 1 January 2004 and accordingly communicated (April 2007) gap fund requirement of ₹71 lakh to MoES. Subsequently MoES informed (August 2007) its autonomous bodies that as the scheme for permitting shift from CPF to 'Defined Contribution Scheme' might take some time, the proposal for providing gap fund had not been agreed to by the Department of Expenditure, MoF.

INCOIS nevertheless submitted (February 2008) a proposal to its Governing Council (GC) seeking approval for introduction of the 'Defined Benefit Scheme of LIC' for the employees of INCOIS who joined before 1 January 2004 and for meeting the gap fund requirement from the revenue generated under the consultancy projects taken up by INCOIS. The GC accorded (February 2008) in-principle approval to the proposal but recommended that

it be submitted to MoES for approval. MoES, however, reiterated (August 2008) that MoF had not agreed to the proposal for introduction of Pension Scheme.

Subsequently MoF issued (June 2009) orders that the employees of Central Autonomous Bodies who joined before 1 January 2004 may also be permitted to shift to the New Pension Scheme (NPS) introduced for the employees who joined after 1 January 2004 and instructed that these employees may be given an option either to remain in the existing CPF scheme or move over to the NPS. In spite of the decision of MoF, INCOIS again mooted (July 2009) the proposal for introduction of the 'Defined Benefit Scheme', which was recommended by its Finance Committee and approved by the GC.

Thereafter INCOIS entered (May 2010) into an agreement with LIC of India for execution of Defined Benefit Pension Scheme and constituted (April 2011), an INCOIS Defined Pension Benefit Scheme (IDBPS) Trust for administration of the scheme. As of March 2012 an amount of ₹2.47 crore was deposited in the IDBPS Trust under the scheme to meet the gap between fund availability and requirement.

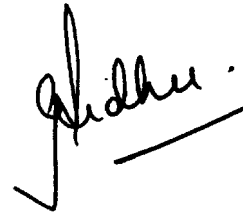
Thus INCOIS introduced the LIC Pension scheme for its staff that joined prior to 1 January 2004 without the approval of its administrative Ministry and in violation of the orders of MoF, which was irregular. Audit also observed that of the deposit of ₹2.47 crore, an amount of ₹1.23 crore was met from the interest earned on grant received from MoES for the procurement of High Performance Computing System Solutions under a project titled 'INCOIS infrastructure and Ocean Information Services'. The diversion of interest receipts was in violation of the terms and conditions of the grant, which stated that the interest earned from the grant would be treated as a credit to the Institute and would be adjusted towards further instalments of the grant.

MoES replied (April 2013) that MoF did not object to introduction of the scheme by the autonomous institutions meeting the gap fund requirements from their own internal accruals. MoES added that the instructions of MoF (June 2009) only made enabling provisions to allow the employees of Autonomous Bodies who joined before 1 January 2004 to join the NPS which was not mandatory. With respect to the audit observation on diversion of interest receipts from grant to meet the gap fund requirement, MoES stated that since INCOIS had not charged overheads on the project, the interest earned on the funds received were treated as internal generation.

The reply of MoES is not acceptable in view of the fact that the instructions of MoF (June 2009) provided clear options of either remaining in the existing

CPF scheme or to move to the NPS. There was no scope for introduction of other pension scheme in the said order of MoF.

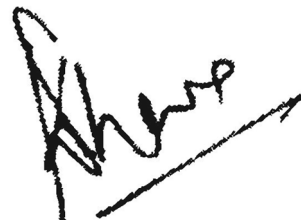
Thus, the introduction of LIC pension scheme by INCOIS without the approval of the administrative Ministry and in contravention of MoF instructions as well as diversion of funds of ₹1.23 crore from the interest earned on grant received from MoES for another project, in violation of the terms and conditions attached to the release of the grant, was irregular.



(GURVEEN SIDHU)
Principal Director of Audit,
Scientific Departments

New Delhi
Dated: 20 August 2013

Countersigned



(SHASHI KANT SHARMA)
Comptroller and Auditor General of India

New Delhi
Dated: 21 August 2013





Appendix I (Refer to Paragraph 1.3)

Brief profile of the Scientific and Environmental Ministries/Departments

1. Department of Atomic Energy (DAE)

DAE is engaged in the development of nuclear power technology, applications of radiation technologies in the fields of agriculture, medicine, industry and basic research. The Department is involved in the design, construction and operation of nuclear power/research reactors and supporting nuclear fuel cycle technologies covering exploration, mining and processing of nuclear minerals, production of heavy water, nuclear fuel fabrication, fuel reprocessing and nuclear waste management. It also supports research in basic sciences, astronomy, astrophysics, cancer research and education through its institutes. The expenditure incurred by DAE during 2011-12 was ₹17,516.61 crore. The activities of DAE are executed through its agencies like Bhabha Atomic Research Centre, Indira Gandhi Centre for Atomic Research, Heavy Water Board, Nuclear Fuel Complex, Atomic Minerals Directorate for Exploration and Research, Tata Memorial Centre, Tata Institute of Fundamental Research, Institute for Plasma Research etc.

2. Department of Space (DOS)

DOS is responsible for the country's programmes for harnessing space technology for national development, while pursuing space science research and planetary exploration. DOS and its constituent units are responsible for planning and execution of national space activities. The main objectives of the space programme include development of satellites, launch vehicles, sounding rockets and associated ground systems. It operates the Indian National Satellite (INSAT) programme for meeting telecommunication, television broadcasting and developmental applications. DOS also deals with matters relating to space science, space technology and space applications. The expenditure incurred by DOS during 2011-12 was ₹3,790.79 crore. The activities of DOS are executed through its agencies like Vikram Sarabhai Space Centre, Satish Dhawan Space Centre, Liquid Propulsion Systems Centre, National Remote Sensing Agency, Physical Research Laboratory etc.

3. Ministry of Environment and Forests (MoEF)

MoEF is the nodal agency for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programmes. The principal activities undertaken by MoEF consist of conservation and survey of flora, fauna, forests and wildlife; prevention and control of pollution; and afforestation and regeneration of degraded areas. MoEF is also engaged in the prevention and abatement of pollution. MoEF is also the nodal Ministry of the country in various international environment oriented programmes. The expenditure incurred by MoEF during 2011-12 was ₹2,270 crore. The activities of MoEF are carried through agencies like Central Pollution Control Board, Botanical Survey of India, Zoological Survey of India, National Biodiversity Authority, Wildlife Institute of India, Indian Council of Forestry Research and Education, Central Zoo Authority etc.

4. Ministry of Science and Technology

The Ministry of Science and Technology has three Departments under its control.

4.1 Department of Science and Technology (DST)

DST plays a pivotal role in promotion of Science and Technology (S&T) in the country. It is the nodal department for organising, coordinating and promoting S&T activities in the country, being responsible for formulation of policies relating to Science and Technology, Research and Development through its research institutions or laboratories, undertaking or financially sponsoring scientific and technological surveys, research design and development and supporting Scientific Research Institutions, Scientific Associations and Bodies by providing Grants-in-aid. The expenditure incurred by DST during 2011-12 was ₹2,521.47 crore. The activities of DST are carried out through agencies like Technology Development Board, Raman Research Institute, Bose Institute, Indian Association for the Cultivation of Science, Indian Institute of Astrophysics, Survey of India, etc.

4.2 Department of Scientific and Industrial Research (DSIR)

The primary endeavor of DSIR is to promote Research and Development (R&D) by the industries and support a large cross section of small/medium industrial units to develop state-of-the art globally competitive technologies of high commercial potential. The Department facilitates scientific and industrial research in the country through commercialization of lab-scale R&D, enhancement of the share of technology intensive exports in overall exports and strengthening of industrial consultancy and technology management capabilities. It also provides a link between scientific laboratories and industrial establishments for transfer of technologies. The expenditure incurred by DSIR during 2011-12 was ₹3,214.70 crore. The Council of Scientific & Industrial Research, a major autonomous body being funded by DSIR comprises of 39 laboratories like National Aerospace Laboratories, National Chemical Laboratory, Central Drug Research Institute, Central Food Technological Research Institute, National Environmental Engineering Research Institute, National Institute of Oceanography etc. These research laboratories carry out applied research in the areas of aerospace, bio-technology, drugs and pharmaceuticals, energy, food and food processing, leather, metals, minerals etc.

4.3 Department of Biotechnology (DBT)

DBT is mandated to promote large scale use of biotechnology in the country through R&D projects, demonstrations and creation of infrastructural facilities for the growth and application of biotechnology in the broad areas of agriculture, health care, animal sciences, environment and industry. The Department is also engaged in promoting University and Industry Interaction, International Collaborations and in evolving Bio Safety Guidelines, manufacture and application of cell based vaccines. The expenditure incurred by DBT during 2011-12 was ₹1,208.43 crore. The activities of DBT are carried through agencies like National Institute of Immunology, National Centre for Cell Science, National Brain Research Centre etc.

5. Ministry of Earth Sciences (MoES)

MoES is mandated to provide the nation with best possible services in forecasting the monsoons and other weather/climate parameters, ocean state, earthquakes, tsunamis and other phenomena related to earth systems through well integrated programmes. MoES also deals with science and technology for exploration and exploitation of ocean resources (living and non-living), and plays a nodal role for Antarctic/Arctic and Southern Ocean research. The expenditure incurred by MoES during 2011-12 was ₹1,174.60 crore. The activities of MoES are carried through agencies like India Meteorological Department, Indian National Centre for Ocean Information Services, National Centre for Antarctic and Ocean Research, National Institute of Ocean Technology, National Centre for Medium Range Weather Forecasting etc.

6. Ministry of New and Renewable Energy (MNRE)

The broad aim of MNRE is to develop and deploy new and renewable energy for supplementing the energy requirements of the country. MNRE seeks to increase the share of clean power through renewable energy (bio, wind, hydro, solar, geothermal and tidal) to supplement fossil fuel based electricity generation. The Ministry aims to develop technologies, processes, materials, components, sub-systems, products and services at par with international specifications by facilitating research, design, development, manufacture and deployment of these energy systems/devices for transportation, portable and stationary applications in rural, urban, industrial and commercial sectors. The expenditure incurred by MNRE during 2011-12 was ₹1,365.22 crore. The activities of MNRE are carried through agencies like Solar Energy Centre, Centre for Wind Energy Technology etc.

7. Ministry of Water Resources (MoWR)

MoWR is responsible for laying down policy guidelines and programmes for the development and regulation of country's water resources. The Ministry carries out overall planning, policy formulation, coordination and guidance in the water resources sector including minor irrigation and development of ground water resources. Besides this, the Ministry is also involved in mediation and facilitation in disputes relating to distribution of inter-state river waters and negotiations with neighbouring countries on river waters. MoWR also provides guidance and support for irrigation, flood control and multi-purpose projects. The expenditure incurred by MoWR during 2011-12 was ₹1,066.03 crore. MoWR is responsible for operation of the central network for flood forecasting and warning on inter-state rivers and preparation of flood control master plans for the Ganga and the Brahmaputra. The Ministry carries out its activities through agencies like Central Water Commission, Central Ground Water Board, National Water Development Agency, etc.

Appendix II (Refer to Paragraph 1.6)

Audit findings from Compliance Audits conducted during the last five years

Report No. and year	Para no.	Subject	Ministry/ Department
CA 16 of 2008-09	2.1	Implementation of a liberalised scheme for doctors in Tata Memorial Centre without approval of Ministry of Finance	DAE
	2.2	Loss of ₹1.84 crore due to non-termination/renegotiation of an agreement	
	2.3	Excess expenditure on security	
	2.4	Avoidable expenditure on power consumption	
	2.5	Non-establishment of world class gamma-ray observatory	
	2.6	Non-achievement of objectives by Board of Radiation and Isotope Technology	
	4.1	Non-recovery of dues from private company on short-closure of the project	DSIR
	4.2	Recovery of dues at the instance of Audit	
	4.3	Avoidable expenditure on electricity for staff quarters	
	4.4	Activities of Institute of Minerals and Materials Technology, Bhubaneswar	
	4.5	Development of technologies on batteries/cells and their commercialisation by Central Electro Chemical Research Institute, Karaikudi	
	4.6	Activities of Central Glass and Ceramic Research Institute, Kolkata	
	5.1	Non-recovery of dues despite development of technology	DST
	5.2	Excess expenditure due to selective adoption of pay structure	
	5.3	Activities of Birbal Sahni Institute of Palaeobotany, Lucknow	
	6.1	Failure of village tree plantation project	MoEF
	6.2	Inadmissible payment of Transport Allowance	
	6.3	Functioning of Central Zoo Authority, New Delhi	
	7.1	Construction of residential quarters and hostel units without demand	MoES
	7.2	Avoidable expenditure due to contracting of higher load	

Report No. and year	Para no.	Subject	Ministry/ Department
17 of 2010-11	2.1	Failure of a scheme for increasing tree cover	MoEF
	2.2	Non achievement of objective of developing forest resources	
	3.1	Regulation of Biodiversity in India	
	3.2	Role of Botanical Survey of India in meeting India's commitments to the Convention on Biological Diversity	
	4.1	Non-achievement of objectives of Ecocity Programme	
	4.2	Non-achievement of objectives of control of pollution caused by leather tanneries	
	5.1	Activities of National Museum of Natural History, New Delhi	
16 of 2011-12	5.1	Wasteful expenditure on refurbishment of a vessel	MoES
	13.1	Infructuous expenditure due to non-utilisation of software	MNRE
	15.2	Deficient implementation of projects for generation of power through safe disposal of waste	DSIR
	15.3	Non-realisation of objectives of a project	
	19.1	Idle investment on development of a Linac tube	DOS
	19.2	Avoidable payment of electricity duty and cess	
4 of 2012-13	Stand alone	Report of the Comptroller and Auditor General of India on hybrid satellite digital multimedia broadcasting service agreement with Devas	DOS
13 of 2012-13	10.1	Avoidable expenditure of ₹3.32 crore	DAE
	11.1	Avoidable payment of demand charges	DOS

Appendix III (Refer to paragraph 1.8)

Grants released to Autonomous Bodies auditable under Section 14 of Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971

(₹ in crore)

Sl.No	Ministry/ Department Name of Autonomous Body	Amount of grants released in 2011-12
DEPARTMENT OF ATOMIC ENERGY		
1.	Harish Chandra Research Institute, Allahabad	21.18
2.	Institute of Mathematical Sciences, Chennai	27.39
3.	Atomic Energy Education Society, Mumbai	43.30
4.	Tata Institute of Fundamental Research, Mumbai	359.08
5.	Tata Memorial Centre, Mumbai	279.99
6.	Institute for Plasma Research, Gandhinagar	451.64
7.	Institute of Physics, Bhubaneswar	28.89
8.	National Institute of Science Education and Research, Bhubaneshwar	210.00
9.	Saha Institute of Nuclear Physics, Kolkata	110.19
DEPARTMENT OF SPACE		
10.	North Eastern Space Application Centre, Shillong	1.75
11.	Indian Institute of Space Technology, Thiruvananthapuram	10.00
12.	National Atmospheric Research Laboratory, Tirupati	13.43
13.	Physical Research Laboratory, Ahmedabad	64.45
14.	Semi Conductor Laboratory, Chandigarh	49.78
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH		
15.	Consultancy Development Centre, New Delhi	4.00
DEPARTMENT OF SCIENCE AND TECHNOLOGY		
16.	Aryabhata Research Institute for Observational Sciences, Nainital	30.00
17.	Birbal Sahni Institute of Paleobotany, Lucknow	19.96
18.	Indian National Academy of Engineering, New Delhi	3.50
19.	Indian National Science Academy, New Delhi	16.25
20.	National Academy of Sciences, Allahabad	9.87
21.	National Accreditation Board for Testing and Calibration Laboratories, New Delhi	0.17
22.	Technology Information, Forecasting and Assessment Council, New Delhi	18.53
23.	Vigyan Prasar, New Delhi	11.03
24.	Wadia Institute of Himalayan Geology, Dehradun	22.96
25.	Agarkar Research Institute, Pune	13.63
26.	Indian Institute of Geomagnetism, Mumbai	28.38
27.	Raman Research Institute, Bengaluru	40.40
28.	Centre for Soft Matter Research, Bengaluru	5.77
29.	International Advanced Research Centre for Powder Metallurgy, Hyderabad	53.20
30.	Indian Institute of Astrophysics, Bengaluru	50.00
31.	Indian Academy of Sciences, Bengaluru	8.18
32.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru	53.20

Sl.No	Ministry/ Department Name of Autonomous Body	Amount of grants released in 2011-12
33.	Bose Institute, Kolkata	60.38
34.	Indian Association for the Cultivation of Science, Kolkata	62.90
35.	S N Bose National Centre for Basic Science, Kolkata	30.10
36.	Indian Science Congress Association, Kolkata	3.87
37.	Institute of Advanced Study in Science and Technology, Guwahati	10.50
38.	National Innovation Foundation, Ahmedabad	9.00
39.	Indo French Centre for Promotion of Advance Research, New Delhi	**
40.	Indo-US S&T Forum, New Delhi	**
DEPARTMENT OF BIOTECHNOLOGY		
41.	National Brain Research Institute, Gurgaon	29.00
42.	National Institute for Plant Genome Research, New Delhi	22.00
43.	National Centre for Cell Sciences, Pune	24.54
44.	National Institute of Immunology, New Delhi	58.305
45.	Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram	31.20
46.	Centre of DNA Finger Printing & Diagnostics, Hyderabad	38.02
47.	Institute of Bio-resources and Sustainable Development, Imphal	7.63
48.	Institute of Life Sciences, Bhubaneswar	35.00
49.	Translational Health Science and Technology Institute, Faridabad	**
50.	UNESCO Regional Centre for Education and Training, Faridabad	**
51.	National Agri-Food Biotechnology Institute and Bio-processing Unit, Mohali	**
52.	Institute for Stem Cell Research and Regenerative Medicine Bengaluru	**
53.	National Institute of Biomedical Genomics, Kalyani	**
MINISTRY OF ENVIRONMENT AND FORESTS		
54.	Central Pollution Control Board, Delhi	62.00
55.	G.B. Pant Institute of Himalayan Environment and Development, Almora	10.47
56.	Indian Institute of Forest Management, Bhopal	12.50
57.	Indian Council of Forestry Research and Education, Dehradun	125.07
58.	Indian Plywood Industries Research and Training Institute, Bengaluru	9.55
MINISTRY OF NEW AND RENEWABLE ENERGY		
59.	Centre for Wind Energy Technology, Chennai*	11.90
60.	Sardar Swaran Singh National Institute of Renewable Energy, Kapurthala	6.50
MINISTRY OF EARTH SCIENCES		
61.	National Institute of Ocean Technology, Chennai	124.11
62.	Indian Institute of Tropical Meteorology, Pune	107.19
63.	Indian National Centre for Ocean Information Services, Hyderabad	51.41
64.	National Centre for Antarctic & Ocean Research, Goa	298.51
TOTAL		3,301.75

* Audit is conducted under Section 20 of the C&AG's DPC Act 1971, however the audit is of a superimposed nature.

** Information not available

Appendix IV (Refer to Paragraph 1.9)**Outstanding Utilisation Certificates**

Ministry/ Department	Period to which grant relates	Number of utilisation certificates outstanding due by March 2012	Amount (₹ in lakh)
Department of Atomic Energy	1991-92	1	2.51
	1996-97	4	4.12
	1997-98	3	3.38
	1998-99	3	1.64
	99-2000	7	16.56
	2000-01	6	14.24
	2001-02	2	2.60
	2002-03	1	0.80
	2003-04	4	4.50
	2004-05	10	122.07
	2005-06	15	19.35
	2006-07	49	106.34
	2007-08	47	406.48
	2008-09	37	372.98
	2009-10	45	1,176.32
	2010-11	71	1,051.63
Total		305	3,305.52
Department of Space	1976-77	1	0.05
	1979-80	1	0.05
	1980-81	1	0.38
	1981-82	1	0.03
	1982-83	5	0.69
	1983-84	1	0.02
	1984-85	3	0.97
	1985-86	1	0.05
	1986-87	5	1.30
	1987-88	2	4.88
	1989-90	2	0.07
	1991-92	1	0.15
	1993-94	1	1.28
	1998-99	1	0.20
	99-2000	2	1.30
	2000-01	4	54.87
	2001-02	7	128.91
	2002-03	11	162.75
	2003-04	15	202.95
	2004-05	12	218.62
2005-06	28	124.50	
2006-07	17	31.46	
2007-08	15	50.47	
2008-09	25	272.26	

Ministry/ Department	Period to which grant relates	Number of utilisation certificates outstanding due by March 2012	Amount (₹ in lakh)
	2009-10	59	232.12
	2010-11	81	503.01
	Total	302	1,993.34
Ministry of Environment & Forests	1981-82	15	5.79
	1982-83	21	41.00
	1983-84	90	58.50
	1984-85	143	229.80
	1985-86	121	495.40
	1986-87	74	533.77
	1987-88	278	6,531.00
	1988-89	359	2,543.18
	1989-90	545	192.00
	1990-91	70	123.30
	1991-92	81	1,439.00
	1992-93	216	736.00
	1993-94	64	74.18
	1994-95	83	167.88
	1995-96	82	174.18
	1996-97	305	1,058.36
	1997-98	156	557.99
	1998-99	316	758.70
	99-2000	300	1,234.98
	2000-01	327	797.95
	2001-02	355	1,006.82
	2002-03	308	944.23
	2003-04	382	1,321.76
	2004-05	372	1,569.67
	2005-06	291	1,434.86
	2006-07	281	1,801.41
	2007-08	292	2,410.71
	2008-09	241	1,973.48
2009-10	198	7,957.95	
2010-11	182	43,833.32	
	Total	6,548	82,007.17
Ministry of New and Renewable Energy	2005-2006	1	3.34
	2006-2007	1	2.00
	2007-2008	10	230.06
	2008-2009	21	405.23
	2009-2010	63	1,524.72
	2010-2011	142	6,095.94
	Total	238	8,261.30
Ministry of Earth Sciences	1983-84	9	0.72
	1984-85	25	44.47
	1985-86	19	5.51
	1986-87	15	7.95
	1987-88	37	39.80

Ministry/ Department	Period to which grant relates	Number of utilisation certificates outstanding due by March 2012	Amount (₹ in lakh)
	1988-89	43	140.90
	1989-90	66	65.21
	1990-91	39	251.23
	1991-92	6	83.83
	1992-93	20	205.27
	1993-94	16	91.90
	1994-95	13	53.88
	1995-96	36	203.90
	1996-97	37	54.37
	1997-98	52	228.88
	1998-99	40	251.18
	99-2000	40	691.04
	2000-01	34	173.16
	2001-02	18	124.58
	2002-03	10	17.12
	2003-04	47	101.18
	2004-05	32	485.41
	2005-06	45	286.65
	2006-07	39	701.12
	2007-08	82	768.06
	2008-09	59	1,035.63
	2009-10	64	497.27
	2010-11	209	1,876.01
Total		1,152	8,486.23
Ministry of Water Resources	1986-87	3	12.50
	1987-88	1	4.04
	1988-89	2	4.23
	1989-90	2	2.85
	1990-91	3	7.17
	1991-92	3	6.56
	2000-01	1	3.34
	2001-02	2	40.00
	2006-07	6	39.53
	2007-08	42	432.25
	2008-09	69	1,077.82
	2009-10	62	587.02
2010-11	124	2,901.34	
Total		320	5,118.65
Grand Total		8,865	1,09,172.20

Appendix V (Refer to Paragraph 1.10)**Summarised financial results of Departmentally Managed Government Undertakings***(₹ in lakh)*

Sl. No.	Name of the Undertaking	Period of Accounts	Government Capital	Block Assets (Net)	Depreciation to date	Profit (+) Loss (-)	Interest on Government Capital	Total return	Percentage of total return to mean Capital	Remarks
1.	Nuclear Fuel Complex	2011-12	92,408.90	62,528.48	28,094.53	18,133.54	12,195.63	30,329.17	33.40	Figures are Provisional
2.	Heavy Water Board	2011-12	16,30,103.39	33,553.31	1,25,133.20	-29,328.39	97,810.58	68,482.19	5.51	Figures are Provisional

Appendix VI (Refer to Paragraph 1.11)**Statement of losses and irrecoverable dues written off/waived during 2011-12***(₹ in lakh)*

Name of Ministry/ Department	Write off of losses and irrecoverable dues due to									
	Failure of system		Neglect/fraud etc.		Other reasons		Waiver of recovery		Ex-gratia Payments	
	No. of cases	Amount	No. of cases	Amount	No. of cases	Amount	No. of cases	Amount	No. of cases	Amount
Department of Atomic Energy	-	-	-	-	25	8.00	-	-	-	-
Department of Space	-	-	-	-	3	0.20	-	-	2	2.00
Department of Scientific and Industrial Research	-	-	-	-	Nil	Nil	-	-	-	-
Department of Science and Technology	-	-	-	-	Nil	Nil	-	-	-	-
Department of Bio-Technology	-	-	-	-	Nil	Nil	-	-	-	-
Ministry of Environment and Forests	-	-	-	-	Nil	Nil	-	-	-	-
Ministry of New and Renewable Energy	-	-	-	-	Nil	Nil	-	-	-	-
Ministry of Earth Sciences	Not available									
Ministry of Water Resources	-	-	-	-	4	0.257	1	24.78	-	-
Total	-	-	-	-	32	8.457	1	24.78	2	2.00

Appendix VII (Refer Paragraph 1.13)

Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments up to the year ended March 2012 as of December 2012- ATNs which have not been received from the Ministry/Department even for the first time

Sl. No	Report No. & Year	Paragraph No.	Para title	Delay in submission of ATNs (in months)
DEPARTMENT OF SCIENCE AND TECHNOLOGY				
1.	13 of 2007 (PA)	3	Internal controls in Department of Science and Technology	63
2.	CA 16 of 2008-09	5.2	Excess expenditure due to selective adoption of pay structure	25
3.	CA 16 of 2008-09	5.3	Activities of Birbal Sahni Institute of Palaeobotany, Lucknow	25
MINISTRY OF ENVIRONMENT AND FORESTS				
4.	21 of 2011-12	Standalone	Performance Audit of Water Pollution in India	12

Appendix VII A (Refer Paragraph 1.13)

Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments up to the year ended March 2012 as of December 2012- ATNs on which Audit has given comments/observations but revised ATNs have not been received for more than six months

Sl. No.	Report No. & Year	Paragraph No.	Title	Delay in submission of ATNs (in months)
DEPARTMENT OF ATOMIC ENERGY				
1.	5 of 2001	5.3	Avoidable expenditure on energy charges	12
2.	5 of 2002	9.1	Avoidable expenditure due to negligence	8
3.	9 of 2006	6.0	Non Tax receipts of Department of Atomic Energy	11
4.	PA 19 of 2008	Standalone	Management of Fuel for Pressurised Heavy Water Reactor (Front end of Nuclear Fuel Cycle)	30
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH				
5.	6 of 1996	5.2	Review on Central Road Research Institute	194
6.	6 of 1996	5.8	Extra expenditure for unconsumed power	190
7.	5 of 1998	2.1	Review of Manpower Audit of CSIR	141
8.	5 of 1998	2.3	Review of Industrial Toxicology Research Centre, Lucknow	18
9.	5 of 1999	4.4	Extra expenditure due to defective design	148
10.	5 of 2003	2.1	Review of Technology transfer in Council of Scientific and Industrial Research	11
11.	5 of 2003	4.2	Unfruitful expenditure	17
12.	5 of 2005	6.1	Wasteful expenditure	69
13.	CA 16 of 2008-09	4.1	Non-recovery of dues from private company on short closure of the project	46
14.	CA 16 of 2008-09	4.2	Recovery of dues at the instance of Audit	17

Sl. No.	Report No. & Year	Paragraph No.	Title	Delay in submission of ATNs (in months)
DEPARTMENT OF SCIENCE AND TECHNOLOGY				
15.	5 of 2005	5.1	Unfruitful expenditure during GTS-Bicentenary celebration	86
16.	1 of 2006	3	Functioning of Technology Development Board	37
17.	CA 3 of 2008	5.1	Unfruitful expenditure	23
18.	CA 3 of 2008	5.2	Irregular extension of service	19
19.	CA 16 of 2008-09	5.1	Non-recovery of dues despite development of technology	24
DEPARTMENT OF BIOTECHNOLOGY				
20.	5 of 2003	3.1	Review of Department of Biotechnology	109
MINISTRY OF ENVIRONMENT AND FORESTS				
21.	5 of 1998	9.1	Review of Indian Council of Forestry Research and Education, Dehradun	12
22.	5 of 2003	10.1	Avoidable payment of interest and non-receipt of refund of Income Tax	9
23.	18 of 2006 (PA)	Standalone	Conservation and Protection of Tigers in Tiger Reserves	23
24.	CA 16 of 2008-09	6.1	Failure of village tree plantation project	7
25.	CA 16 of 2008-09	6.2	Inadmissible payment of Transport Allowance	8
26.	No. 17 of 2010-11	2.2	Non-achievement of objective of developing forest resources	16
MINISTRY OF EARTH SCIENCES				
27.	CA 16 of 2008-09	7.1	Construction of residential quarters and hostel units without demand	11