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Report of the Comptroller and Auditor General of India for the year ended March 2017

Union Government
Scientific and Environmental Ministries/Departments

Report No. 2 of 2018

(Compliance Audit)

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Contents

Preface

This report of the Comptroller and Auditor General of India for the year ended March 2017 has been prepared for submission to the President under Article 151 of the Constitution of India. The report contains the results of compliance audit of the Scientific and Environmental Ministries/Departments of the Union Government, their attached/subordinate offices and Autonomous Bodies.

Reports in relation to accounts of a Government Company or Corporation are submitted by the Comptroller and Auditor General of India to the Government under Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. This Audit Report also contains audit observations relating to Central Public Sector Enterprises under the administrative control of the Scientific and Environmental Ministries/Departments.

The instances mentioned in this report are those which came to notice in the course of test audit for the period 2016-17 as well as those which came to notice in earlier years but could not be reported in the previous Audit Reports. Matters relating to the period subsequent to 2016-17 have also been included, wherever necessary.

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

Overview

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 as well as of autonomous bodies and Central Public Sector Enterprises under them. The report contains 20 paragraphs involving ₹ 448.62 crore relating to weaknesses in procurement and contract management, inefficient project management, irregular financial benefits extended to employees and deficient internal controls. An overview of the main audit findings included in this report is given below.

Review of Outcome Budget of Ministry of New and Renewable Energy

Ministry of New and Renewable Energy did not follow Government instructions on parameters for preparation of Outcome Budget. This resulted in non-inclusion of information on normal savings resulting from economic use of the resources, the latest position of outstanding Utilization Certificates and unspent balances with States and implementing agencies in the Outcome Budget. There were also discrepancies in data maintained by MNRE and State nodal agencies thereby undermining the utility of the Outcome Budget as an instrument to measure outcomes expected from the financial outlays being made.

(Chapter 2)

Activities of Heavy Water Board

Delay in decision making for dismantling and disposal of the closed Heavy Water Plant at Baroda and delay in closure of the Heavy Water Plant at Talcher by the Heavy Water Board resulted in avoidable expenditure of ₹ 68.26 crore on their maintenance. There was time overrun of one month to more than seven years in 29 projects and cost overrun of ₹ 12.32 crore in five projects. Oxidation system established at a cost of ₹ 8.66 crore could not be utilised due to lack of feeder gas.

(Paragraph 3.1)

Short-realisation of ground rent

Directorate of Construction Services and Estate Management was unable to renew license agreements and revise ground rent in respect of land leased to oil companies due to lack of decision by Department of Atomic Energy which resulted in short realization of rent and interest of ₹ 12.78 crore. Besides, an amount of ₹ 50.39 lakh towards interest on delayed payment of ground rent was also recoverable.

(Paragraph 3.2)

Outstanding dues pending for recovery

Board of Radiation and Isotopes Technology failed to take timely action to establish proper mechanism for realizing payments towards sale of radioactive material and allied products which resulted in outstanding dues of ₹ 10.71 crore.

(Paragraph 3.3)

Irregular Leave Travel Concession Claims

Nuclear Fuel Complex, Hyderabad, did not exercise stipulated checks before passing Leave Travel Concession bills of its employees which resulted in payment of ₹ 40.11 lakh towards irregular claims.

(Paragraph 3.4)

Activities of Institute of Bio-resources and Sustainable Development

The Institute of Bio-resources and Sustainable Development, Imphal could not make substantial progress towards achievement of its objective of bio-resource development and their sustainable utilization through bio-technological intervention for economic growth of the region even after a lapse of more than 15 years since its inception.

(Paragraph 4.1)

Irregular grant of promotion and entitlement

National Centre for Cell Science, Pune, did not follow extant rules and orders in the matter of promotions of scientific staff under Flexible Complementing Scheme and foreign tours. This resulted in irregular payment of salary, transport allowance and for foreign tours totalling ₹ 93.26 lakh to its personnel.

(Paragraph 4.2)

Non-utilisation of land procured for construction of staff quarters

National Institute of Immunology failed to utilize land acquired at a cost of ₹ 3.93 crore for constructing staff quarters even after lapse of 17 years resulting in avoidable payment of ₹ 35.89 lakh as penalty for delay in construction and pending liability of ₹ 41.14 lakh towards penalty.

(Paragraph 4.3)

Avoidable expenditure towards price escalation

Indian Association for the Cultivation of Science, Kolkata, incurred avoidable expenditure of ₹ 52.78 lakh and further liability of ₹ 31.01 lakh towards price escalation in the execution of a short term contract.

(Paragraph 5.1)

Non-recovery of penal interest

Failure of Department of Scientific and Industrial Research to impose penal interest on delayed remittances of its share of income from projects funded to private industries resulted in non-recovery of ₹ 2.55 crore.

(Paragraph 6.1)

Management of Eleventh Five Year Plan projects of CSIR

Audit of 27 selected Eleventh Five Year Plan projects under the National Laboratory Scheme of the Council of Scientific and Industrial Research revealed deficiencies in monitoring system in terms of non-constitution/ delayed constitution of the Task Forces/ Sectoral Monitoring Committees/ Research Councils and shortfall in the number of meetings these agencies had to conduct to oversee the implementation of the projects.

(Paragraph 6.2)

Avoidable payment of electricity charges

Delayed action by the Indian Institute of Chemical Biology, Kolkata for reducing the contract demand resulted in avoidable expenditure of ₹ 64.90 lakh towards billing demand charges paid to West Bengal State Electricity Distribution Company.

(Paragraph 6.3)

Operationalisation of Satellite Navigation System

NAVIC was approved by the Government of India in May 2006 at a cost of ₹ 1,420 crore to establish an independent and indigenous satellite based navigation system over the Indian landmass and surrounding region. An expenditure of ₹ 1,283.93 crore had been incurred on the programme so far. However, the system has yet to be operationalised due to delays in execution of contracts, deficient monitoring of programme and inadequate follow up. In addition, ₹ 3.57 crore were spent on unnecessary procurement of modems.

(Paragraph 7.1)

Infructuous expenditure on software development

Failure to implement and properly monitor a project on development of Digital Workflow System by the Department of Space resulted in non-development of the software for more than 11 years since its initiation despite expenditure of ₹ 2.27 crore.

(Paragraph 7.2)

Avoidable payment of rent for bonded warehouse

Centre for Marine Living Resources & Ecology, Kochi, stored unused and condemned items in a bonded warehouse thereby incurring avoidable expenditure of ₹ 1.03 crore towards rent of the bonded warehouse.

(Paragraph 8.1)

Irregular protection of pay

National Institute of Ocean Technology, Chennai, irregularly granted protection of pay of contract employees on their appointment on regular basis. This resulted in excess payment of pay and allowances of ₹ 1.97 crore to 44 employees.

(Paragraph 8.2)

Non-utilisation of Solar Thermal Power Plant

Failure to develop a dedicated workforce that could ensure continuous operation of a solar thermal power plant and research facility resulted in non-utilisation of the facility created at a cost of ₹ 46.36 crore.

(Paragraph 9.1)

Irregular payment on leave encashment

Encashment of Half Pay Leave/Sick Leave in deviation from DPE guidelines resulted in irregular payment of ₹ 10.53 crore during 2013-14 to 2016-17.

(Paragraph 10.1.1)

Non-Compliance of DPE Guidelines

Irregular payment due to non-approval of incentive scheme and excess payment on account of Encashment of Earned Leave to employees to the tune of ₹ 6.85 crore.

(Paragraph 10.2.1)

CHAPTER - I

Introduction

1.1 About this Report

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

The Auditing Standards adopted by the Comptroller and Auditor General of India 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 thereby contributing to better governance.

This chapter, in addition to explaining the planning and extent of audit, provides a brief analysis of the expenditure of the Scientific and Environmental Ministries/Departments and their financial management. Audit selected one of the Ministries for review of its Outcome Budget to ascertain whether it was in conformity with the stipulated guidelines. The Ministry selected was that of New and Renewable Energy and the audit findings are brought out in Chapter II. Chapters III to IX present findings/observations arising out of the compliance audit of the Scientific and Environmental Ministries/Departments and research centres, institutes and autonomous bodies, while Chapter X contains audit findings relating to Central Public Sector Enterprises (CPSEs) under their administrative control.

1.2 Audit coverage

This Audit Report contains Audit findings relating to the following Scientific and Environmental Ministries/Departments of the Government of India and their units including CPSEs:

1) **Department of Atomic Energy (DAE)**
2) **Ministry of Science and Technology**
    a) **Department of Bio-Technology (DBT)**

b) Department of Science and Technology (DST); and

c) Department of Scientific and Industrial Research (DSIR)

3) Department of Space (DOS)

4) Ministry of Earth Sciences (MoES) including India Meteorological Department

5) Ministry of Environment, Forest and Climate Change (MoEFCC)

6) Ministry of New and Renewable Energy (MNRE)

7) Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWRRD&GR)

1.3 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 commences with the assessment of risk of the Ministry/Department as a whole and of each unit based on expenditure incurred, the criticality/complexity of its activities, the level of delegated financial powers, assessment of 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 is decided. An annual audit plan is thereafter 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 issued separately as draft paras to the heads of the Administrative Ministries/ Departments for their comments and processed for inclusion in the Audit Reports which are submitted to the President of India under Article 151 of the Constitution of India.

During 2016-17, compliance audit of 180 out of 465 units of Scientific and Environmental Ministries/Departments was conducted based on available resources and risk assessment of the units. In addition, compliance audit was also conducted in 15 CPSEs.

1.4 Budget and expenditure controls

The comparative position of budget and expenditure of the Scientific and Environmental Ministries/Departments during 2016-17 and preceding two years is given in Table 1.1 below.

Table 1.1: Budget and Expenditure of Scientific and Environmental Ministries/Departments

(₹ in crore)

Ministry/ Department	2015-16				2016-17				Share in AE	
	BE	AE	Un-spent budget	Un-spent budget as % of BE	BE	AE	Un-spent budget	Un-spent budget as % of BE	2015-16	2016-17
1) DAE	17,702.1	16,380.7	1,321.4	7.46	20,105.4	18,238.4	1,867.0	9.29	34.1	32.8
2) DBT	1,625.2	1,554.3	70.9	4.36	1,917.2	1,895.5	21.7	1.13	3.2	3.4
3) DST	3,861.9	3,658.5	20.3	0.53	4,496.4	4,325.6	170.8	3.80	7.6	7.8
4) DSIR	4,038.0	4,028.6	9.4	0.23	4,064.6	4,051.7	12.9	0.32	8.4	7.3
5) DOS	7,388.2	6,920.0	468.2	6.34	8,344.4	8,040.0	304.4	3.65	14.4	14.5
6) MoES	1,622.7	1,328.3	294.4	18.14	1,675.5	1,464.2	211.3	12.61	2.8	2.6
7) MoEFCC	2,122.7	2,024.7	98.0	4.62	3,518.3	3,360.3	158.0	4.49	4.2	6.0
8) MNRE	4,303.3	4,244.8	58.5	1.36	9,997.8	7,754.1	2,243.7	22.44	8.8	14.0
9) MoWRRD&GR	9,272.9	7,906.9	1,366.0	14.73	8,815.5	6,427.3	2,388.2	27.09	16.5	11.6
Total	**51,936.9**	**48,046.7**	**3,707.1**	**7.14**	**62,935.1**	**55,557.1**	**7,378.0**	**11.72**	**100.0**	**100.0**

Source: Appropriation Accounts of the respective years
BE and AE refer Budget Estimates and Actual Expenditure respectively

The total expenditure of the Scientific and Environmental Ministries/Departments of the Government of India during 2016-17 was ₹ 55,557.1 crore as against ₹ 48,046.7 crore in 2015-16 viz. an increase of ₹ 7,510.4 crore (15.6 *per cent*). Of the total expenditure of ₹ 55,557.1 crore incurred by the Scientific and Environmental Ministries/Departments during 2016-17, 32.8 *per cent* was incurred by DAE followed by DOS and MNRE (14.5 and 14.0 *per cent* respectively).

The actual expenditure of all Scientific and Environmental Ministries/Departments increased from one to 82.7 *per cent* during 2016-17 over the expenditure during 2015-16 except MoWRRD&GR. There was a significant increase in expenditure of MNRE (82.7 *per cent*), MoEFCC (66 *per cent*) and DBT (22 *per cent*) during 2016-17 over the previous year whereas there was a marked decrease in expenditure in MoWRRD&GR during 2016-17 by 18 *per cent* over the previous year.

With reference to the total budget allotment of ₹ 62,935.1 crore, the Scientific and Environmental Ministries/ Departments had an overall unspent budget of ₹ 7,378 crore which constitutes 11.72 *per cent* of the total grant/appropriation as against the unspent budget of only seven *per cent* during 2015-16. While there was a significant unspent budget of 18.14 *per cent* in MoES during 2015-16, significant unspent budget of 27.09 *per cent* was recorded in MoWRRD&GR during 2016-17.

Out of the total unspent budget of ₹ 7,378 crore, the unspent budget in MoWRRD&GR (27.09 *per cent*) and MNRE (22.44 *per cent*) were the highest.

1.5 Audit of Autonomous Bodies

There are 14 Autonomous Bodies (ABs) under the nine Scientific and Environmental Ministries/Departments for which Separate Audit Reports (SARs) are prepared on their accounts under sections 19(2) and 20(1) of the Comptroller & Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The total grants released to these 14 ABs during 2016-17 were ₹ 5,421.84 crore including previous year unspent grants as detailed in Table 1.2. below.

Table 1.2: Grants released to Central Autonomous Bodies

(₹ in crore)

	Autonomous Body	Ministry/ Department	Amount of Grant released during 2016-17
1)	Science and Engineering Research Board, New Delhi	DST	767.00
2)	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram	DST	160.93
3)	Technology Development Board, New Delhi	DST	30.30
4)	Council of Scientific and Industrial Research, New Delhi	DSIR	589.87
5)	Animal Welfare Board of India, Chennai	MoEFCC	3.70
6)	Central Zoo Authority, New Delhi	MoEFCC	10.93
7)	National Biodiversity Authority, Chennai	MoEFCC	18.69
8)	National Tiger Conservation Authority, New Delhi	MoEFCC	7.41
9)	Wildlife Institute of India, Dehradun*	MoEFCC	26.50
10)	Betwa River Board, Jhansi	MoWRRD&GR	26.10
11)	Brahmaputra Board, Guwahati	MoWRRD&GR	71.39
12)	Narmada Control Authority, Indore	MoWRRD&GR	21.68
13)	National Mission for Clean Ganga, New Delhi	MoWRRD&GR	3,612.51
14)	National Water Development Agency, New Delhi	MoWRRD&GR	74.83
	Total		**5,421.84**

Source: Separate Audit Reports/Annual accounts of the Autonomous Bodies for the year 2016-17
*Entrustment of audit of accounts for the year 2016-17 onwards is awaited.

In addition, compliance audit of ABs is also conducted under Sections 14 or 15 of the C&AG's (DPC) Act, 1971. The total grants released to 56 ABs during 2016-17 were ₹ 4,265.67 crore. The details are given in ***Appendix I***.

1.5.1 Delay in submission of accounts

The Committee on Papers Laid on the Table of the House in its First Report (Fifth Lok Sabha) 1975-76 and Rule 237 of General Financial Rules (GFR), 2017 mention that every AB should complete its accounts within a period of three months after the close of the accounting year and make their accounts available for audit and that the Annual Reports along with the audited annual accounts should be laid before Parliament within nine months of the close of the accounting year.

Out of the 14 ABs, three ABs[1] submitted their accounts for the year 2016-17 after delay of one month or more.

[1] Technology Development Board, New Delhi, National Tiger Conservation Authority, New Delhi, and Narmada Control Authority, Indore.

1.6 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 information furnished by nine Ministries/Departments, 65,182 Utilisation Certificates (UCs) due by March 2017 for grants released upto March 2016 aggregating ₹ 22,421.79 crore were outstanding as given in Table 1.3. below.

Table 1.3: Utilisation Certificates outstanding as on 31 March 2017

Ministry/Department	Number of outstanding UCs	Share of total outstanding UCs (%)	Amount pertaining to outstanding UCs *(₹ in crore)*	Share of amount pertaining to total outstanding UCs (%)
1) DAE	1,865	2.9	172.57	0.8
2) DBT	21,043	32.3	5,589.65	24.9
3) DST	35,224	54.0	10,427.01	46.5
4) DSIR	869	1.3	1,373.27	6.1
5) DOS	261	0.4	11.97	0.1
6) MoES	857	1.3	240.80	1.1
7) MoEFCC	4,027	6.2	469.62	2.1
8) MNRE	769	1.2	1,845.14	8.2
9) MoWRRD&GR	267	0.4	2,291.76	10.2
TOTAL	**65,182**	**100.0**	**22,421.79**	**100**

It can be seen from the above table that the maximum number of outstanding UCs relate to DST and DBT.

Ministry/Department-wise and period wise position of outstanding UCs is given in ***Appendix II***. In terms of period of pendency, maximum number and value of UCs outstanding for more than five years were in DST.

1.7 Departmentally Managed Government Undertakings - Position of Proforma Accounts

Rule 84 of the GFRs, 2005, stipulates that Government Departments working on a commercial or quasi-commercial basis shall be required to maintain such subsidiary proforma accounts in commercial form as may be agreed between Government and the Comptroller and Auditor General of India. This includes the maintenance of suitable Manufacturing, Trading, Profit & Loss Accounts and Balance Sheet.

There were two Departmentally Managed Government Undertakings of commercial or quasi-commercial nature as of 31 March 2017 under DAE, viz. Nuclear Fuel Complex, Hyderabad (NFC) and Heavy Water Board, Mumbai (HWB). The financial results of these undertakings are to be reported through proforma accounts generally consisting of Trading Account, Profit and Loss Account and Balance Sheet.

Audit of profroma accounts of NFC for the year upto 2010-11 was completed. Proforma accounts for the years 2011-12 and 2012-13 were found to be incomplete as DAE had not included the cost of imported fuel in the same. The matter was referred to DAE and a decision was still awaited as of August 2017. The proforma accounts of HWB for the period up to 2012-13 were received for audit. Accounts for the subsequent years were not received for audit.

1.8 Audit of Central Public Sector Enterprises

The accounts of Government Companies set up under the provisions of the Companies Act (including Companies deemed to be Government Companies as per provisions of the Companies Act) are audited by the Comptroller and Auditor General of India (C&AG) under Section 143(6) of the Companies Act, 2013. The accounts certified by the Statutory Auditors (Chartered Accountants) appointed by the C&AG under the Companies Act are subject to supplementary audit by C&AG whose comments supplement the reports of the Statutory Auditors. In addition, these companies are also subject to audit by C&AG.

Reports in relation to the accounts of a Government Company or Corporation are submitted to the Government by C&AG under the provisions of Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971.

There were 25 CPSEs under the nine Scientific and Environmental Ministries/Departments audited under Section 143(6) of the Companies Act, 2013 for 2016-17. A list of these Companies is given in ***Appendix-III***.

1.9 Losses and irrecoverable dues written off/waived

Statement of losses and irrecoverable dues written off/waived during 2016-17 furnished by seven Ministries/Departments is given in ***Appendix IV*** to this Report. A total amount of ₹ 16.96 lakh was written off in 30 cases under the category 'other reasons' in DAE and DOS.

1.10 Response of the Ministries/Departments to Draft Audit Paragraphs

On the recommendations of the Public Accounts Committee (PAC), 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. This time frame has also been prescribed under Para 207 (1) of Regulations on Audit and Accounts, 2007, made by the C&AG.

The Draft Paragraphs are forwarded to the Secretaries of the Ministries/Departments concerned drawing their attention to the audit findings and requesting them to send their response within six weeks. Draft Paragraphs proposed for inclusion in this

report were forwarded to the Secretaries concerned between June 2017 and November 2017 through letters addressed to them personally.

This report contains 20 paragraphs. The replies of concerned Ministries/Departments were received in respect of only three paragraphs. The responses received have been suitably incorporated in the Report.

1.11 Follow-up on Audit Reports

In its Ninth Report (Eleventh Lok Sabha) presented to Parliament on 22 April 1997, the PAC recommended that Action Taken Notes (ATNs) on all paragraphs pertaining to the Audit Reports for the year ended 31 March 1996 onwards should be submitted to them, duly vetted by Audit, within four months from laying of the reports in the Parliament.

A review of outstanding ATNs as of 31 December 2017 on paragraphs included in the Reports of the C&AG pertaining to Scientific and Environmental Ministries/Departments (details in ***Appendix V-A***) revealed that seven ATNs pending from six Ministries/ Departments were not received even for the first time. In addition, two ATNs pertaining to CPSEs under administrative control of three Ministries/Departments were not received even for the first time (details in ***Appendix V-B***). Also, revised ATNs of 39 cases were pending from seven Ministries/ Departments for periods ranging up to eight months as of December 2017 (***Appendix VI***).

CHAPTER – II

Review of Outcome Budget of Ministry of New and Renewable Energy

Ministry of New and Renewable Energy did not adhere to instructions on parameters for preparation of Outcome Budget. This resulted in non-inclusion of information on normal savings resulting from economic use of the resources and the latest position of outstanding Utilization Certificates and unspent balances with States and implementing agencies in the Outcome Budget. There were also discrepancies in data maintained by MNRE and State nodal agencies rendering the Outcome Budget unreliable in terms of information on the programmes supported by the Ministry.

2.1 Introduction

The Outcome Budget, which commenced from the budget of 2005-06 in Government of India, broadly indicates the physical dimensions of the financial budgets and the physical performance in past years. The Outcome Budget envisages tracking not just the intermediate physical "Outputs" that are more readily measurable but also the "Outcomes" which are the end objectives of budgetary intervention. The Outcome Budget would also cover information on normal savings resulting from economic use of resources, under/non-utilization i.e. savings due to non-implementation or delay in execution of projects/ schemes and surrenders. As brought out at Table 1.1 in Chapter 1, an amount of ₹ 7,754.1 crore was spent during 2016-17 against the budget allocation of ₹ 9,997.8 crore leaving 22.44 *per cent* of budget unspent.

A review of the Outcome Budget of the Ministry of New and Renewable Energy was conducted with the objective of ascertaining-

a. whether applicable laws, rules and regulations made there under and various orders and instructions issued by the Competent Authority for preparation of Outcome Budget were complied with; and
b. whether there were inconsistencies in reporting of physical targets and whether data was reliable.

The period of Financial Years (FY) 2013-14 to 2016-17 was selected for analysis of Outcome budget. The Ministry supports 26 different programmes/schemes which include two schemes for Wind Power, one scheme (five sub schemes) for Small Hydro Power (SHP), 13 schemes for Solar Energy, five schemes for Bio-Energy, two schemes for Energy Access and three schemes for Support Programmes.

Of these, two schemes/programmes viz. SHP and Biomass power/bagasse cogeneration were selected for detailed analysis of Outcome Budget.

2.2 Audit Findings

The audit findings are discussed in the succeeding paragraphs.

2.2.1 Deviation from Government instructions

As per the guidelines for preparation of Outcome Budget 2016-17 issued by the Ministry of Finance (MoF), the broad format for preparation of Outcome Budget was as follows:

a. Executive summary;
b. Introduction;
c. Statement of Budget Estimate;
d. Reform measures and policy initiative;
e. Review of past performance;
f. Financial review; and
g. Review of performance of statutory and Autonomous Bodies

A test-check of Outcome-Budget 2016-17 prepared by MNRE revealed the following deviations from the guidelines issued by MoF.

2.2.1.1 Non-framing of Executive Summary

As per the MoF guidelines, the Executive Summary should prominently highlight the details of the monitoring mechanism and the public information system put in place by the Ministry/Department to regularly monitor physical and financial progress during the course of the year and inform the general public. However, it was noticed that the Executive Summary was not framed as stipulated in the MoF guidelines.

In respect of the selected schemes viz. Biomass and SHP projects, Audit observed that there was no monitoring system in place to regularly capture status of the progress of projects. The absence of any definite monitoring mechanism led to discrepancies in the data maintained by the Ministry as discussed in paras 2.2.2 and 2.2.3.

2.2.1.2 Parameters/guidelines not followed

The Guidelines for preparation of Outcome Budget 2016-17 defined various parameters against which the Outcome Budget was to be prepared. Audit observed that the Outcome Budget of MNRE did not contain observation/information on certain parameters as shown in Table 2.1 below.

Table 2.1: Status of compliance to various parameters of Outcome Budget

Sl. No.	Parameters of Outcome Budget	Audit Finding	Reply of the Ministry and Audit observation
1.	Position of outstanding Utilization Certificates (UCs) and unspent balances with States and	Under Financial Review, MNRE had indicated only the financial year wise break-up of the pending UCs. The	MNRE stated (July 2016) that there was a system to capture and monitor scheme-wise, agency wise and age wise UCs.

Sl. No.	Parameters of Outcome Budget	Audit Finding	Reply of the Ministry and Audit observation
	implementing agencies was to be given in the Outcome Budget.	State/implementing agencies/scheme wise break up was not shown. Position of outstanding UCs given in the Outcome Budget of 2016-17 was updated only up to 2013-14 and not upto 2015-16, as available with the Pay and Accounts Office (PAO) of MNRE. According to the Outcome Budget, 360 UCs were shown as pending up to 2013-14, whereas according to the information obtained from the PAO, 627 UCs were pending for the period up to 2015-16.	*Audit observation:* The fact remained that the scheme wise status of UCs, though available, was not reflected in the Outcome Budget.
2.	Ministry was to put in place systems for collection of relevant data with help of specialised agencies.	There were discrepancies in database of MNRE and State Nodal Agencies relating to commissioning of projects, as detailed in paras 2.2.2 and 2.2.3. This indicates that MNRE did not put in place an efficient system for collection of data.	Reply was awaited.
3.	Outcome Budget should contain information about normal savings resulting from economic use of the resources; saving due to under/non-utilization/ delay in execution of projects/ schemes and savings due to obsolete/ defunct projects/ schemes or due to completion of a project/scheme and funds are not (no more) required.	During FYs 2014-15, 2015-16 and 2016-17, there were persistent savings of ₹ 539 crore, ₹ 58 crore and ₹ 2,244 crore respectively. As per the Appropriation Accounts (2014-15), the reasons for savings were stated to be due to non-receipt of adequate proposals, non-submission of completion certificate, reduction at Revised Estimate (RE) stage, etc. However, no such information was mentioned in the Outcome Budget of 2016-17.	MNRE stated (June 2017) that the expenditure was reviewed from time to time and appropriate re-appropriation of the budget was undertaken accordingly. *Audit observation:* The fact remains that the information on savings was not reflected in the Outcome Budget as required.

2.2.2 Small Hydro Power Programme

One of the objectives of the Ministry was to achieve total installed capacity of Small Hydro Power (SHP)[2] projects of about 7,000 MW by the end of the 12th Plan. Towards this end, the focus of the SHP programme is to lower the cost of equipment, increase its reliability and set up projects in areas which give the maximum advantage in terms of capacity utilization. MNRE has created a database of potential sites of SHPs and

[2] Hydro power projects up to 25 MW per station capacity

6,474 potential sites with an aggregate capacity of 19,749.44 MW for projects up to 25 MW capacity have been identified.

MNRE provides Central Financial Assistance (CFA)[3] for setting up new SHP projects to State Government as well as private, cooperative and joint sectors, resource assessment and support for identification of new sites for SHP and for renovation and modernization of existing SHP projects in the Government sector.

The financial outlay and actual expenditure under SHP during the period from 2012-13 to 2016-17 is given in Table 2.2 below.

Table 2.2: Financial targets and achievements under SHP

₹ in crore

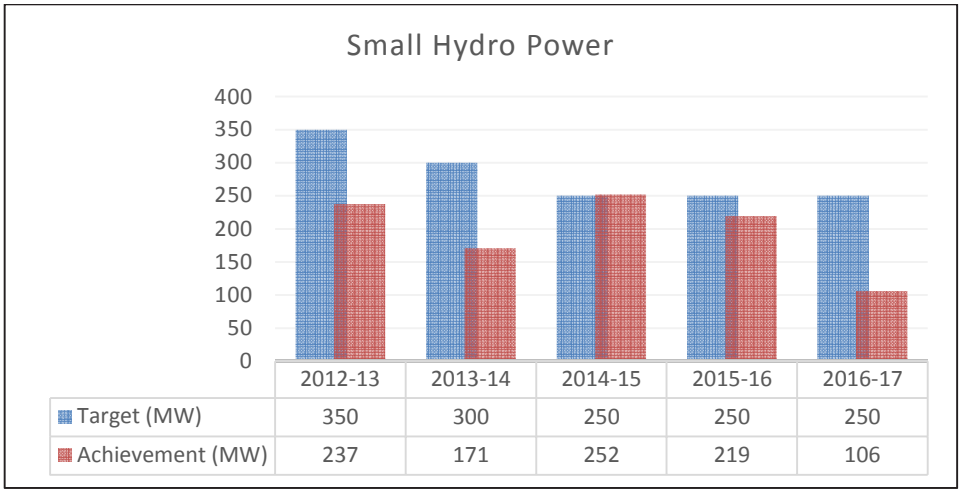
Year	Outlay	Actual expenditure
2012-13	159.00	158.93
2013-14	123.18	122.82
2014-15	108.00	107.99
2015-16	105.05	104.99
2016-17	125.00	124.70

Audit observed deficiencies in the assessment of deliverables, availability of information on the performance of SHP and review of projects shown in the Outcome Budgets of MNRE as discussed below.

2.2.2.1 Quantifiable Deliverables/Projected Physical outputs (Targets)

As per the Outcome Budget, the quantifiable deliverables for 2012-13 and 2013-14 were 350 MW and 300 MW respectively while it was 250 MW each for 2014-15, 2015-16 and 2016-17. However, the basis of assessment of quantifiable deliverables (target setting) for the FYs were not available on record. Achievements of MNRE against targets set are shown in Chart 2.1 below.

Chart 2.1: Targets and Achievement for 2012-17



Source: Target and achievements as per Outcome Budget and website of MNRE

[3] Central Financial Assistance (CFA) for projects of different categories is given in the form of capital subsidy/ Grants-in-aid to promote/develop a particular sector.

It can be seen from the Chart that MNRE was unable to achieve the targets set in any of the FYs from 2012-13 to 2016-17 except during 2014-15. The shortfall in achievement of targets was 32 *per cent* in 2012-13, 43 *per cent* in 2013-14, 12 *per cent* in 2015-16 and 58 *per cent* in 2016-17. Audit further observed that the Ministry subsequently revised the target set for the year 2016-17 from 250 MW to 150 MW. However, even then there was a shortfall of 29 *per cent* in achievement of the revised target. It was evident that targets were not being set in a realistic manner taking into account all relevant and foreseeable factors. Hence, the targets could not serve as a benchmark for measuring or assessing achievement.

MNRE stated (August 2017) that the actual implementation of SHP projects is governed by State policies and activities such as decision of setting up SHP projects, invitation of bids from private developers, allotment of projects, various clearances, land acquisition, etc. Ministry added that construction period of SHP is usually long due to construction in river/stream and location in remote and hilly areas and due to unforeseen circumstances like landslides, slope failures, geological surprises, snowfall or prolonged monsoons due to which the targets are not achieved. Non-availability of adequate evacuation facilities also delays the process of commissioning of the projects. MNRE further stated (August 2017) that physical targets were re-visited/revised every year based on the annual allocation of funds.

Audit observed that the assessment of targets for award and implementation of projects needs to be done in a realistic manner in consultation with all primary agencies/departments involved taking into account all foreseeable factors like obtaining of statutory clearances by State Government and other limiting factors.

2.2.2.2 Discrepancies in data of commissioned SHP projects

A test check of records/data of projects commissioned by the Maharashtra Energy Development Agency (MEDA) during 2014-17 brought out discrepancies/mismatch between records provided by MEDA and MNRE as detailed in Table 2.3 below.

Table 2.3: SHP projects commissioned during 2014-17 maintained by MEDA and MNRE

FY	Details with MEDA		Details with MNRE	
	Project	Capacity (MW)	Project	Capacity (MW)
2014-15	1. Vajra III HEP	1.50	1. Phatakwadi, Kolhapur	8.00
	2. Pench Kamathi Khari LBC HEP	4.40		
Total		**5.90**		**8.00**
2015-16	1. Nilwande low level HEP Tq: Akole, Dist:Ahmadnagar	7.00	1. Mukane, Nasik	1.45
	2. Barvi HEP (4.5 MW), Dist. Thane	4.50	2. Waghur, Jalgaon	1.50

FY	Details with MEDA		Details with MNRE	
	Project	Capacity (MW)	Project	Capacity (MW)
	3. Hetawane HEP Tal.-Pen, Dist. Raigad	1.50		
	4. Urmodi, A/p Ambavade, Satara	3.00		
Total		**16.00**		**2.95**
2016-17	1. Waghur, Jalgaon	1.50	1. Hettawane, Raigad	1.50
	2. Chikotra, Kolhapur	1.80	2. Mulla Dam Rauri, Ahemednagar	4.80
	3. Kanher left bank, Satara	1.20		
Total		**4.50**		**6.30**

The difference in database maintained by MEDA and MNRE resulted in depiction of over-achievement of 2.1 MW and 1.80 MW during 2014-15 and 2016-17 respectively and under-achievement of 13.05 MW in the status of SHP projects shown in the Outcome Budget 2016-17. In fact, except two SHPs, namely Waghur (Jalgaon) and Hettawane (Raigad), details available in the two sets of data did not match in any of the three years under review.

Similarly, test check of record/data of commissioned projects of Punjab Energy Development Agency (PEDA) during 2014-17 also revealed discrepancies in number of projects commissioned maintained by PEDA and MNRE as brought out in Table 2.4 below.

Table 2.4: SHP projects commissioned during 2014-17 maintained by PEDA/MNRE

FY	Details with PEDA		Details with MNRE	
	Project	Capacity (MW)	Project	Capacity (MW)
2014-15	1. Sidhawan Hydro Power Pvt. Ltd Sidhawan , Ludhiana	0.70	Nil	-
	2. Atlantic Power (Phoola) Pvt. Ltd Bathinda	0.60		
Total		**1.30**		**0**
2015-16	Nil		1. Ludhiana SHP	0.70
			2. Phoola SHP	0.60
			3. RD 14350	6.00
			4. RD 20500	3.80
			5. Bibiwala	0.40
			6. Kunjar	2.00
Total		**0**		**13.50**

FY	Details with PEDA		Details with MNRE	
	Project	Capacity (MW)	Project	Capacity (MW)
2016-17	1. SKR Hydro Power Project Generator Pvt. Ltd Bathinda, Bibiwala	0.40	Nil	-
	2. Gill Acqua Hydro Power generation company pvt ltd Madhopur RD 14350 combined	6.00		
	3. Gill Acqua Hydro Power generation company Pvt. Ltd. Madhopur RD 20500 Pathankot	3.80		
Total		**10.20**		**0**

Thus, during 2014-15, 2015-16 and 2016-17, actual physical outputs (targets) with respect to the three projects were understated by 1.30 MW, overstated by 13.50 MW and understated by 10.20 MW respectively in the Outcome Budgets.

Discrepancies in data maintained by the State agencies and MNRE indicates deficiency in the system of collection and compilation of data for preparation of Outcome Budget. Evidently, accuracy of the data shown in the Outcome Budget could not be ensured.

MNRE stated (August 2017) that the projects were physically completed as informed by the project developers and accordingly reported by the MNRE. However, projects may have been commissioned/performance testing done at a later stage. MNRE however agreed that in future only commissioned projects will be reported. MNRE added that no State wise targets were fixed in SHP programme and physical targets were revisited/revised each year based on allocation of funds.

Thus, the objective of Outcome Budget as an indicator of measurable outputs and outcomes of the activities of the Ministry was not entirely fulfilled.

2.2.3 Bagasse co-generation and Biomass power

Central Financial Assistance (CFA) for private sector projects is released after successful commissioning and announcement of commercial generation and testing of the project. In the case of bagasse co-generation projects in cooperative/public sector sugar mills implemented by State Government Undertaking/State Government joint venture company through BOOT/BOLT model and co-generation projects by cooperative/public sector sugar mills themselves, 50 *per cent* of eligible CFA is provided upfront and the balance 50 *per cent* is released after successful commissioning and performance testing of the project.

The financial outlay and actual expenditure under Bagasse and Biomass power projects during the period from 2012-13 to 2016-17 is given in Table 2.5 below.

Table 2.5: Financial targets and achievements under Bagasse Co-generation and Biomass Power Projects

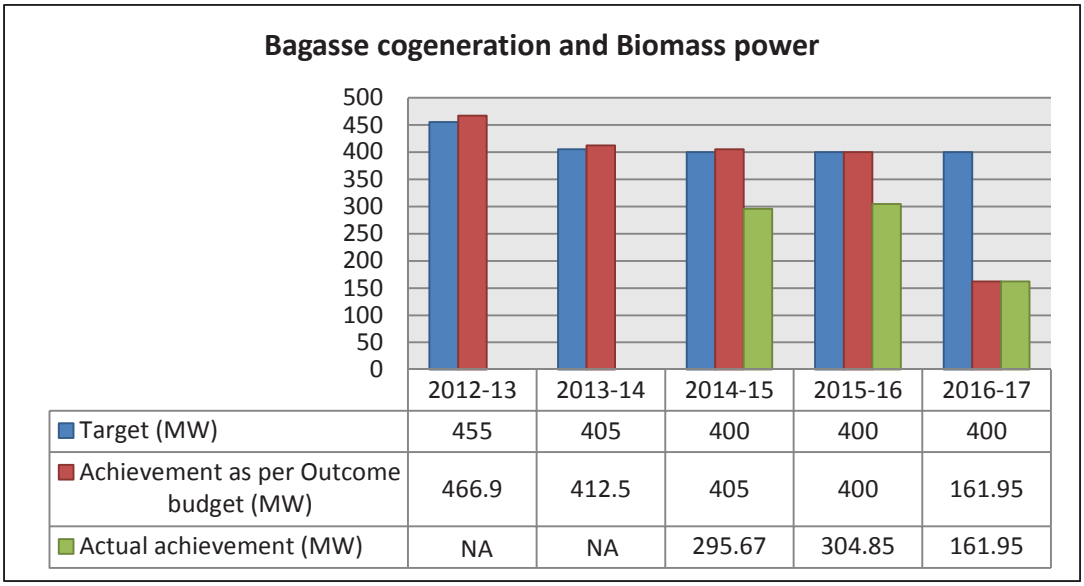
₹ in crore

Year	Outlay (RE)	Actual expenditure
2012-13	81.00	63.87
2013-14	34.54	34.53
2014-15	25.00	25.00
2015-16	29.00	28.03
2016-17	17.00	10.29

2.2.3.1 Monitoring and capturing data of commissioned projects mechanism

MNRE did not establish a mechanism for monitoring and capturing data of commissioned projects. Audit noticed discrepancies in data of MNRE and State Nodal Agencies. The achievements mentioned in the Outcome Budget against stipulated targets and actual achievement are shown in Chart 2.2 below.

Chart 2.2: Targets and achievements during 2012-17



	2012-13	2013-14	2014-15	2015-16	2016-17
Target (MW)	455	405	400	400	400
Achievement as per Outcome budget (MW)	466.9	412.5	405	400	161.95
Actual achievement (MW)	NA	NA	295.67	304.85	161.95

Note: The achievement for 2014-15 and 2015-16 (February 2016) is from outcome budget and for 2016-17 from website of MNRE.

Thus, the achievements reported by MNRE in the Outcome Budgets for the years 2014-15 and 2015-16 were inflated. There was actually a shortfall in achievement of targets 104.33 MW in 2014-15, 95.15 MW in 2015-16 and 238.05 MW during FY 2016-17.

The significant shortfall in meeting the targets suggests that MNRE did not assess its targets in a realistic manner and the target of the previous FY (2014-15) was replicated for the next FYs (2015-16 and 2016-17) without taking into consideration achievement there against. Further, discrepancies in data between the achievements mentioned in the Outcome Budget/website of MNRE with the data as per records maintained in MNRE cast a doubt on the accuracy of data reported by MNRE in its Outcome Budget.

2.3 Conclusion

MNRE deviated from extant instructions on parameters for preparation of Outcome Budget. Outcome Budget of MNRE did not give information about normal savings resulting from economic use of the resources, current position of outstanding Utilization Certificates and unspent balances with States and implementing agencies. Physical output targets were not fixed in a realistic manner. There were data discrepancies that undermined the utility of the Outcome Budget as an instrument to measure outcomes expected from the financial outlays being made.

The matter was referred to the Ministry (October 2017); its reply was awaited as of December 2017.

CHAPTER – III

Department of Atomic Energy

3.1 Activities of Heavy Water Board

Delay in decision making for dismantling and disposal of the closed Heavy Water Plant at Baroda and delay in closure of the Heavy Water Plant at Talcher by the Heavy Water Board resulted in avoidable expenditure of ₹ 68.26 crore on their maintenance. There was time overrun of one month to more than seven years in 29 projects and cost overrun of ₹ 12.32 crore in five projects. Oxidation system established at a cost of ₹ 8.66 crore could not be utilised due to lack of feeder gas.

3.1.1 Introduction

The Department of Atomic Energy (DAE) is engaged in the development of nuclear and radiation technologies and their application in the fields of agriculture, medicine, industry and basic research. It involves the use of Pressurized Heavy Water Reactors (PHWR) operated by the Nuclear Power Corporation of India Ltd. (NPCIL), a public sector undertaking of DAE, to generate nuclear power. An important component of a PHWR is Heavy Water[4] (HW) which is required initially by the PHWRs to attain criticality and thereafter as a moderator[5] and coolant[6] during operation and periodically to make up for losses[7].

The Heavy Water Board (HWB), one of the industrial units under DAE, is responsible for production of HW and nurturing and facilitating R&D activities in the connected areas of technology. Its mandate includes design, engineering, construction, operation and maintenance of Heavy Water Plants as well as development of new processes, regular production of HW, development of technologies and production of solvents required for closed nuclear fuel cycle activities. HWB has set up seven Heavy Water Plants (HWPs) at various locations in the country.

The activities of HWB are monitored by a Board which consists of 11 members with the Chief Executive as the Chairman of the Board and representatives from DAE,

[4] D_2O-Deuterium Oxide

[5] Moderator is required in a thermal reactor to slow down the neutrons produced in the fission reaction so that the chain reaction can be sustained.

[6] Heat energy produced in the fission reactor is removed by coolant. Heavy Water is used as a primary coolant to transport heat generated by the fission reaction to secondary coolant, light water.

[7] Loss of HW due to leakage, evaporation, etc., during operation is to be made-up by refilling HW.

BARC, NPCIL, DPS[8], HWB and distinguished Scientists/Professors from the Indian Institutes of Technology.

The budget and expenditure of HWB for the period from 2012-13 to 2016-17 is given in Table 3.1 below.

Table 3.1: Budget and Expenditure for 2012-2017

(₹ in crore)

	2012-13	2013-14	2014-15	2015-16	2016-17
BE	701.05	830.00	936.82	1,032.00	1,123.58
Actual	812.50	864.89	1,053.58	1,025.76	1,066.26
% Variation	16	4	12	-1	-5

As seen from above, there was excess of expenditure over Budget Estimates during 2012-13 to 2014-15 ranging from four to 16 *per cent* and unspent budget of one and five *per cent* during 2015-16 and 2016-17.

HWB executed 39 projects during the 10th, 11th and 12th Five Year Plans related to up-keep of plants[9], procurement of equipment for replacement and spares and acquisition of land. The total sanctioned cost of the projects was ₹ 420.43 crore, against which an expenditure of ₹ 266.61 crore i.e. 63.4 *per cent,* was incurred up to March 2017.

An audit of HWB and HWPs was conducted to examine the management, maintenance and operation of HWPs and implementation of projects covering the period from 2012-13 to 2016-17. Two out of four operating plants and three closed/ suspended plants were selected for detailed audit. Of the 39 projects executed by HWB, 33 ongoing/ completed projects covering an expenditure of ₹ 250.77 crore were selected based on stratified random sampling method.

3.1.2 Audit Findings

3.1.2.1 Management of Heavy Water Plants

(a) Avoidable expenditure of ₹ 68.26 crore on maintenance of closed plants

(i) Heavy Water Plant, Baroda

HWP Baroda was commissioned in 1977 at a cost of ₹ 34.74 crore and was linked to the Gujarat State Fertilizers & Chemicals Limited (GSFC) for feed synthesis gas. Due to the GSFC commissioning (1998) a less energy intensive new ammonia plant and consequent non-availability of feed synthesis gas, operations at the HWP Baroda had to be stopped with effect from April 2011.

The Atomic Energy Commission (AEC) in its meeting held in March 2011 stated that the majority of equipment at HWP Baroda had served their useful life and the usable

[8] Directorate of Purchase and Stores, the centralised procurement unit of DAE.

[9] Revamping & modernisation, minor modification, improvements in safety, environment and energy conservation, ageing management and system up-gradation, etc.

plant/equipment could be utilised in other DAE facilities, the remaining were to be declared as scrap/surplus and disposed of as per the extant rules of the Department.

After lapse of five years thereafter, HWP Baroda constituted a committee in June 2016 for preparation of cost estimate for dismantling the towers, piping and structure material of the plant. Based on the recommendation of the committee to dismantle and dispose about 20 *per cent* of the total structure and consider disposal of the remaining on as-is-where-is basis, the Board approved (September 2016) dismantling and disposal of surplus material of HWP Baroda. The Committee estimated the total cost for dismantling of main plant and Front End Unit at ₹ 3.60 crore.

Subsequently, the Board suggested in March 2017 that a comprehensive disposal methodology be adopted so that the expenditure required for dismantling can be met from the proceeds of the expected revenue generation on account of the disposed items. Board further directed that the proposal for dismantling and disposal of plant should be forwarded to DAE for submission to the AEC. In October 2017, the AEC in its 230th meeting approved the dismantling and disposal of surplus material.

Audit observed that DAE took five years to constitute a committee for disposal of towers, piping and structural material of the plant. During this delay of five years in formation of committee and decision for dismantling and disposal, HWP Baroda had to continue to incur avoidable recurring expenditure towards maintenance of main plant since its closure in April 2011. The expenditure incurred since April 2011 to March 2017 towards maintenance of the main plant amounted to ₹ 13.92 crore.

(ii) Heavy Water Plant, Talcher

HWP Talcher was set up in April 1985 at a cost of ₹ 73.83 crore and was linked to the feed synthesis gas available from Fertilizer Corporation of India Limited (FCIL). In April 1994, the operation of this plant was suspended due to non-availability of feed synthesis gas from FCIL on sustained basis. DAE explored the possibility of developing a front-end technology during the period 2004 to 2011 to re-start its operations but it was subsequently abandoned due to high cost of production.

In September 2016, the Board felt that it would not be prudent to restart HWP Talcher as the process deployed for HW production at Talcher was not used anywhere in the world and the plant could not achieve sustained operation due to several process related problems. It accordingly decided that a committee should be formed to take a view regarding closing HWP Talcher. Based on the recommendation of the committee formed by HWB in October 2016, the Board submitted a proposal (November 2016) to DAE for closure of HWP Talcher. The proposal was pending for approval of DAE as of April 2017.

Audit observed that despite non-availability of feed synthesis gas since April 1994 and even after the front-end technology proved to be a non-starter in April 2011, the plant was not declared 'closed' and HWB continued to incur expenditure towards

preservation of plant and its maintenance. HWB had incurred an expenditure of ₹ 54.34 crore towards maintenance of the plant from April 2011 to March 2017.

HWB stated (March 2017) that a front end technology was being studied at HWP Baroda for installation at Talcher for its re-start. Audit observed that the front end technology had been unsuccessfully demonstrated at HWP Baroda which was then permanently closed by AEC in April 2011 due to high energy consumption and uneconomical operation. Hence, the delay in closure of HWP Talcher remained unexplained.

Thus, delay in dismantling and disposal of spares of HWP Baroda and delay in closure of HWP Talchar resulted in avoidable expenditure of ₹ 68.26 crore on maintenance and preservation of the two plants from April 2011 to March 2017.

3.1.2.2 Project Management

Eighteen of the 33 selected projects[10] related to retrofitting, revamping, major repairs, procurement of spares and storage equipment and the remaining 15 projects pertained to developmental activities. As of March 2017, 23 projects were completed and 10 were ongoing.

(a) Time and cost over-run in the projects

Audit observed delays in implementation in 29 out of the 33 selected projects. The delays in these projects ranged from one month to seven years as detailed in the Table 3.2 below.

Table 3.2: Time overrun in projects

Time overrun	Projects
Less than one year	4
Between one and five years	24
More than five years	1

The delays in completion of the projects were attributable *inter alia* to repeated re-tendering, delay in grant of approval at different stages, deficient technical assessment and lack of effective follow up of proposals. Audit also observed that in five projects, time overrun resulted in consequent cost overrun of ₹ 12.32 crore in the projects. The increase in the cost of the projects ranged from 12 to 40 *per cent.* The details of the projects are given in ***Appendices VII A and VII B*****.**

(b) Delay in revamping of Integrated Information System

DAE instructed (April 1996) all its units to place orders relating to software development on Electronics Corporation of India Ltd.[11] (ECIL) wherever it was in a position to fulfil the requirements.

[10] Against sanctioned cost of ₹ 400.03 crore, an expenditure of ₹ 250.77 crore was incurred up to March 2017.

[11] A Public Sector Undertaking under DAE

Based on a proposal of HWB, DAE sanctioned (January 2013) a project "Revamping of existing Integrated Information System (IIS) application software along with IT infrastructure" at HWB and five HWPs at an estimated cost of ₹ 10 crore. The project was to be completed by March 2016. HWB floated a tender in March 2013. However, due to huge variation between the cost quoted in the bids ranging from ₹ 21 to ₹ 48 crore and the estimated cost, HWB re-tendered the work in February 2014.

In the meantime, HWB informed the Apex Committee at its meeting held in October 2013 for implementation of DAE's project titled DIMIS[12] that it was in the process of designing a new Management Information System and that the requirement of DIMIS would be included in it. In this meeting, ECIL expressed its willingness to provide support in the development of the DIMIS project.

Accordingly, HWB scrapped the earlier tender and floated (May 2014) another tender with a revised scope of work against which only one bid was received. HWB re-issued (September 2014) a fresh tender notice, against which again, a single bid was received. Further, there was a huge variation between the estimated cost and the quoted cost and HWB did not pursue the tender.

Thereafter, HWB enhanced the sanctioned cost of the project to ₹ 14 crore with the approval of DAE (November 2016) and the project duration was re-scheduled to December 2018. HWB submitted (December 2016) a proposal to DAE for placing the order on ECIL through MoU for revamping of existing IIS application software with DIMIS. Approval of DAE was awaited as of March 2017. However, an expenditure of ₹ 5.93 crore had been incurred on the project as of March 2017 against the sanctioned cost of ₹ 14 crore.

Audit observed that despite DAE's instructions of April 1996, HWB did not approach ECIL in the first instance even though the majority of works related to development, testing, deployment and support for the proposed ERP software. Further, though HWB was aware of the changes in the software system in view of DIMIS requirements since October 2013, it did not include the requirements while re-tendering in February 2014. The huge variation between the estimated and quoted costs on two occasions was indicative of the inability of HWB to assess cost requirements accurately.

HWB stated (February 2017) that ECIL had expressed their willingness for DIMIS project and not for HWB-IIS project. The reply of HWB is not tenable as DAE had instructed in 1996 that ECIL had to be approached in the first instance for all developmental activities of software.

[12] DAE Integrated Management Information System (DIMIS) to integrate all information available with various units / sub-units in DAE for effectively managing its manpower, financial resources, project monitoring, security aspects, etc.

Thus, the project sanctioned in January 2013 was delayed by more than four years and remained incomplete due to multiple cancellations with an expenditure of ₹ 5.93 crore already having been incurred.

(c) Non-utilisation of Oxidation Plant

HWP Kota undertook (May 2009) a project for Oxidation plant at a cost of ₹ 10 crore and scheduled date of completion of July 2012. The plant was to be utilised for storage of tritiated water. The project was completed and the oxidation plant was commissioned in March 2013 at a cost of ₹ 8.66 crore. After test operation for 72 hours, there was no operation thereafter due to non-availability of feed gas from Heavy Water Clean Up Facility (HEWAC).

Thus, HWB installed an Oxidation plant without ensuring sustained availability of feed gas which resulted in non-utilisation of the plant and an idle cost of ₹ 8.66 crore since last four years.

(d) Under-utilisation of Plant

HWB had set up two plants at Talcher (2003) and Baroda (2010) for production of Tri Butyl Phosphate (TBP) with installed capacity of 60 MT and 130 MT per annum respectively. Both the TBP plants are operational.

Audit observed that actual utilisation of TBP was much less than the installed capacity of the existing two plants as detailed in Table 3.3 below:

Table 3.3: Demand, Production and Utilisation of TBP at HWP, Baroda and Talcher

(in MT)

Year	Installed Capacity	Actual production	Demand raised per year	Utilisation	Closing Balance
2011-12	-	-	-	-	114.35
2012-13	190	165.50	123.7	198.54	81.31
2013-14	190	151.85	147.7	79.85	153.31
2014-15	190	158.08	167.7	148.49	162.90
2015-16	190	139.68	177.7	73.03	229.55
2016-17	190	158.28	197.7	85.03	302.80
Total	**950**	**773.39**	**814.5**	**584.94**	**302.80**

Out of the total installed capacity of 950 MT of TBP over the five years from 2012-13 to 2016-17 from the two plants and against a total demand of 814.5 MT from users[13] over the same period, there was production of 773.39 MT against which only 584.94 MT of TBP was utilised. There remained 302.80 MT of TBP as closing balance as on January 2017.

Though the installed capacity of the existing plants exceeded the actual production achieved, the demand raised as well as the utilisation, DAE approved (February 2015)

[13] User of TBP are Heavy Water Board, Nuclear Fuel Complex, Nuclear Recycle Board, Nuclear Recycle Group, Indian Rare Earths Ltd., Indira Gandhi Centre for Atomic Research, Bhabha Atomic Research Centre, etc.

a project for setting up of another Solvent Production Plant[14] at Tuticorin at a sanctioned cost of ₹ 38 crore which includes production of TBP. Inspite of supply being less than the demand, no user seems to have been hampered. This shows that demand was unrealistic. With un-supplied stock remaining in hand, the need to set up a third plant also needs careful assessment.

The proposal/Detailed Project Report (May 2014) was based on demand projected by the users for various types of solvents. It was felt that it would be advantageous to establish a combined plant facility for all types of solvents as it would reduce both project as well as operating costs. The project was approved by DAE in February 2015 with completion target of 36 months i.e. by February 2018. HWB had incurred an expenditure of ₹ 57.54 lakh on this project till March 2017.

Audit observed that the initial proposal was for separate plants for TBP and other solvents. There was clearly no requirement of additional production capacity for TBP since utilisation of TBP was only 73.03 MT in 2015-16 and 85.03 MT in 2016-17 against actual production of 139.68 MT in 2015-16 and 158.28 in 2016-17. It was further noted that combined plants predominantly produced TBP. Hence, setting up of a separate plant to produce only those solvents that were in short supply could have been considered.

Thus, setting up of a third Plant that included production of TBP while the capacity of the existing two plants remained under-utilised has the risk of either idling of the third plant or under-utilisation of its capacity.

3.1.2.3 Management of Heavy Water Pool

The entire production and purchase/import of HW is transferred to a "Heavy Water Pool". The purchase, storage, central accounting, inventory management and distribution to various users of HW was declared a commercial activity with effect from 1 July 1979. Heavy Water Pool is treated as a capital asset and HWB maintains Proforma Accounts in respect of the Heavy Water Pool Management (HWPM). However, HWB did not submit Proforma Accounts from the year 2013-14 onwards. Due to non-submission of Proforma Accounts, the financial position of HWB for four years during 2013-14 to 2016-17 could not be ascertained.

Though DAE decided (2004) to review every five years the costing of Heavy Water and accounting and pricing of Heavy Water pool taking into consideration the developments taking place during the intervening period, no review of the pricing policy due in 2009 had been carried out as of March 2017.

3.1.2.4 Other issues

(a) Non realisation of compensation claim

According to Rule 9 of GFRs, 2005, it is the duty of the Department to ensure that the receipts and dues of the Government are correctly and promptly assessed, collected and duly credited to the Consolidated Fund or Public Account, as the case may be.

[14] Solvents – TBP (150 MTPA), D2EHPA-II, TiAP and DHOA (20-30 MTPA)

A Captive Power Plant (CPP) was set up in 1991 at HWP Manuguru to ensure reliable steam and power supply to the process plant for production of HW. In January 2005, HWB decided that since the steam and electrical consumption in the main plant had reduced due to intensive energy conservation measures and process optimisation, the plant was in a position to export 12 MWe of power. Accordingly, HWB entered (February 2005) into an agreement with Power Trading Corporation Ltd. (PTC) for sale of 12 MWe of power. As per the terms and conditions, PTC shall pay compensation at 20 *per cent* of tariff per kwh of short fall in excess of permitted deviation of 15 *per cent* in drawing of power.

Audit observed that during the period from December 2014 to February 2017, compensation of ₹ 6.51 crore was receivable from PTC towards shortfall in extraction of power. However, HWP Manuguru failed to take up the matter with PTC and recover the amount. Audit further observed that there was no prescribed date for payment of the compensation in the agreement entered with PTC nor in any subsequent correspondence.

Thus, failure to take timely action resulted in outstanding compensation claims of ₹ 6.51 crore.

(b) Non fulfilment of environment obligation

Ministry of Environment, Forest and Climate Change (MoEFCC) notified (September 1999) guidelines for use and disposal of fly ash produced at coal/lignite based power plants. The guidelines stipulated utilisation of the entire quantity of fly ash generated in the power plants in a phased manner. According to the Notification, every coal or lignite based thermal power plant shall make available ash without any payment for the purpose of manufacturing ash-based products such as cement, concrete blocks, bricks, etc. Subsequently, MoEFCC amended (November 2009) the notification, stipulating utilisation of fly ash in a phased manner starting from at least 50 *per cent* within one year to 100 *per cent* within five years[15] of date of issue of the amendment. A further amendment (March 2015) required the power plants to display their stock of fly ash on their websites and update it every fortnight.

A Captive Power Plant (CPP) commissioned at HWP Manuguru consumed about 1,200-1,600 MT coal per day and generated around 300-720 MT of ash per day. In pursuance of the directives of MoEFCC, HWP established (March 2011) a dry fly ash collection, segregation and storage facility at a cost of ₹ 11.66 crore.

Audit observed that HWP Manuguru could not utilise fly ash as prescribed in the MoEFCC notification. As of March 2017 i.e. after eight years from the MoEFCC

[15] The notification prescribed utilization of at least 50 *per cent* within one year; 60 *per cent* within two years; 75 *per cent* within three years; 90 *per cent* within four years; and 100 *per cent* within five years.

notification, HWP Manuguru utilised only 66 *per cent* against MoEFCC's prescribed scale of 100 *per cent*. Further, HWB did not display fly ash stock position in its website, which was against MoEFCC's directives.

Thus, HWP, Manuguru failed to fulfil its obligations to mitigate environmental pollution through safe utilisation of fly ash.

(c) Avoidable payment towards transportation of coal

HWP Manuguru entered (December 2008) into an agreement with a firm for operation and maintenance of external coal handling system in its Captive Power Plant area. This agreement was valid for a period of five years i.e. up to October 2013, with a provision for extension by two more years on the satisfactory performance of the contractor. The agreement was subsequently extended up to October 2015. After fresh tendering process (January 2015), the work was awarded to the same firm (February 2016) for a period of five years up to January 2021 as this was the only firm that responded to the tender.

As per the work order, a minimum quantity of 60,000 MT per month/ 2,400 MT per day of coal was to be transported by the firm to HWP Manuguru. In case of loss of transportation hours due to reasons not attributable to contractor, compensation[16] was payable to the firm.

On scrutiny of the measurement book along with the payments made to the firm for the period April 2012 to February 2017, it was observed that HWP Manuguru indented and received coal ranging between 200 MT to 60,715 MT every month and the quantity exceeded 60,000 MT only in three months (December 2012, January 2014 and January 2016). Due to the shortfall in drawing coal, HWP Manuguru paid ₹ 7.66 crore as compensation to the firm.

Consistent shortfall in drawing of coal for nearly five years from April 2012 to February 2017 indicates that HWP Manuguru did not assess its actual requirements accurately.

HWP Manuguru stated (July 2016) that any reduction of minimum quantity of 60,000 MT without reducing inputs/resources for O & M of the system will only work out in the benefit of the contractor. It added that transportation of 60,000 MT of coal in a month mentioned in the work order is the minimum quantity required to achieve break-even point to meet the expenditure of establishing semi-permanent nature resources involving skilled workmen and specialized tools and tackles to execute ropeway system Operation & Maintenance activities.

The reply is not tenable in view of the fact that the average requirement of coal during the five-year period April 2012 to February 2017 was only 40,076 MT. The coal transportations exceeded 60,000 MT only on three occasions.

[16] Compensation for 1 MT = Basic price for 60,000 MT as per agreement *Plus* Escalation due to hike in labour wages *divided* by 60,000 MT.

Thus, HWP Manuguru failed to realistically assess the quantity of coal to be transported which resulted in payment of ₹ 7.66 crore towards compensation.

3.1.3 Conclusion

Audit of Heavy Water Board revealed undue delays in taking decisions for dismantling and disposal of the closed Heavy Water Plant at Baroda and for closure of the Heavy Water Plant at Talcher resulting in avoidable expenditure of ₹ 68.26 crore on maintenance.

Further, projects undertaken by HWB suffered from delays in execution. Of the 33 selected projects, there were delays in implementation in 29 projects for time period ranging from one month to more than seven years. There was cost over-run in five projects. An oxidation plant was installed at a cost of ₹ 8.66 crore without ensuring sustained availability of feed gas.

DAE also failed to take timely action for realisation of compensation claims totaling ₹ 6.51 crore as of March 2017 from PTC. There were shortcomings in discharge of environment obligations regarding safe disposal of fly ash by one plant as well as failure to realistically asses the transportation of coal in captive power plants that resulted in avoidable payment of ₹ 7.66 crore.

The matter was referred to DAE (November 2017); its reply was awaited as of December 2017.

3.2 Short-realisation of ground rent

Directorate of Construction Services and Estate Management was unable to renew license agreements and revise ground rent in respect of land leased to oil companies due to lack of decision by Department of Atomic Energy which resulted in short realization of rent and interest of ₹ 12.78 crore. Besides, an amount of ₹ 50.39 lakh towards interest on delayed payment of ground rent was also recoverable.

The Directorate of Construction Services and Estate Management, Mumbai (DCSEM), the construction wing of the Department of Atomic Energy (DAE), entered (1997) into license agreements with Hindustan Petroleum Corporation Limited (HPCL), Bharat Petroleum Corporation Limited (BPCL), Reliance Industrial Infrastructure Ltd. (RIIL) and National Organic Chemical Industries Ltd. (NOCIL) to route these companies' oil pipelines underneath land belonging to DAE at Anushakti Nagar, Mumbai. License agreements were for a period of 10 years from August 1997 to July 2007.

The annual ground rent for use of the land was fixed at 10 *per cent* of the valuation of the land done through the Director of Town Planning, Government of Maharashtra (DTP). The licensees were to pay interest at the rate of 12 *per cent* per annum for delay in payment of rent.

For the purpose of fixing license fee, DAE referred (1997) the matter of valuation of land to DTP who advised (2001) that the land value mentioned in the Ready Reckoner

should be considered. The oil companies objected (2001) to these rates and referred the matter again to DTP. On the advice (February 2002) of DTP for re-considering the license fee and based on a meeting (July 2002) between representatives of oil companies and DCSEM, the rate of license fee was fixed at 10 *per cent* on 35 *per cent* of the value of land mentioned in the Ready Reckoner for the area occupied[17]. Accordingly, rent was calculated from the date of agreement i.e. August 1997 and paid by the oil companies.

Since the tenure of the license agreements was to expire in July 2007, DCSEM approached DAE (February 2007) for renewal of the agreements. DAE asked (March 2007) DCSEM to work out revised rate of license fee chargeable on renewal of agreements from August 2007 at a uniform rate based on the actual land value as per the Ready Reckoner without applying any concessions. However, the oil companies declined to accept the revised ground rent stating that changes in formula for working out ground rent was made without taking their consent and requested to continue to charge the ground rent worked out on 35 *per cent* of land value as agreed in 2002.

After a meeting (June 2008) with representatives of oil companies, DAE approached DTP for fresh valuation of land who advised (July 2010) DCSEM to adopt the provisions of a Government of Maharashtra Resolution (August 2008) which provided for lease rent of 10 *per cent* of the market value plus interest at Prime Lending Rate (PLR). Accordingly, DCSEM submitted (August 2010) a proposal to DAE for renewal of licence agreement for a further period of 10 years. Since then, the matter has remained under correspondence with DAE. Meanwhile, DCSEM decided (November 2015) to enhance the ground rent at the rate of 15 *per cent* after every three years.

No decision was taken by DAE on revision of ground rent and renewal of agreements. Due to non-revision of ground rent, the oil companies continued to pay rent at the earlier concessional rate. This resulted in short realization of ground rent plus interest of ₹ 12.78 crore[18] in respect of HPCL, BPCL, RIIL for the period from August 2007 to July 2017 and NOCIL for the period August 2007 to July 2012[19]. In addition, an amount of ₹ 50.39 lakh towards interest for the period from 1997 to 2002 towards delayed payment of ground rent was also outstanding from HPCL, BPCL and NOCIL.

DAE stated (December 2017) that the proposal for renewal of the licence agreement with oil companies was submitted to the Atomic Energy Commission (AEC) in May 2011 and thereafter to the Cabinet and based on the orders of the Cabinet (March 2011/November 2011/July 2012), it was decided to refer the matter to Ministry of

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[17] Rent = (35 *per cent* of the land value as per Ready Reckoner x area occupied) x 10 *per cent*

[18] ₹ 11.35 crore (₹ 7.66 crore rent + ₹ 3.69 crore interest at the rate of 12 *per cent* per annum) in respect of HPCL, BPCL and RIIL and ₹ 1.43 crore (₹ 78.04 lakh rent + ₹ 64.51 lakh interest) in respect of NOCIL.

[19] NOCIL ceased to operate the pipeline from June 2006 and cleared the outstanding dues up to July 2012 at the old rates.

Finance. DAE added that the proposal had been forwarded to the Member (Finance), Atomic Energy Commission.

The fact, however, remained that inability of DAE to decide the revision of license fee for the past seven years resulted in short realization of ground rent and interest of ₹ 12.78 crore. Further, DCSEM allowed the oil companies the benefit of using the Government land without any valid agreement for nearly 10 years and at a concessional rent. In addition, an amount of ₹ 50.39 lakh towards interest on delayed payment of ground rent was also not recovered.

3.3 Outstanding dues pending for recovery

Board of Radiation and Isotopes Technology failed to take timely action to establish proper mechanism for realizing payments towards sale of radioactive material and allied products which resulted in outstanding dues of ₹ 10.71 crore pending for recovery.

The Board of Radiation and Isotopes Technology, Mumbai (BRIT), is an independent unit of the Department of Atomic Energy (DAE) which provides products and services based on radiation and isotopes for applications in healthcare, agriculture, research and industry to various Government and non-Government users on payment basis. As per the terms and conditions, the payments were to be received within 30 days after the receipt of invoice towards the sale of radioactive material. If the payments were not received within the stipulated time, further supply was to be suspended without any formal notice.

As of January 2017, an amount of ₹ 19.07 crore was due from customers in 942 cases for sale of radioactive materials. Of these, ₹ 2.75 crore in respect of 154 cases pertained to the period prior to 2010. The age-wise details of outstanding dues are shown in Table 3.4 below.

Table 3.4: Outstanding dues towards sale of radioactive materials

Financial Year	No. of cases	Amount (₹)
Prior to the year 2000	29	25,42,734
2000-10	125	2,49,83,152
2010-14	151	3,42,19,437
2014-15	104	1,31,68,266
2015-16	138	2,41,22,691
2016-17 (up to January 2017)	395	9,16,28,434
Total	**942**	**19,06,64,711**

Audit test checked 36 out of 58 high value[20] cases of private parties and observed that payment of ₹ 23.48 lakh due from three customers was no longer realizable as their whereabouts were not known. In another seven cases, dues of ₹ 44.70 lakh

[20] Valuing more than ₹ one lakh.

were pending for period ranging from three to 11 years as of February 2017 and their realization was now doubtful.

Audit further observed that there was no mechanism in place for timely realization of previous dues before making new supplies. Though reminders for settlement of dues were sent occasionally, supplies were continued for more than a year without ensuring realization of dues towards the previous supplies as stipulated in the terms and conditions of the invoices. There were no penal provisions in place in case of non-payment or delay in receipt of outstanding dues. Reconciliation of accounts between BRIT and the customers was also not done. The lack of any institutional mechanism for realization of dues from customers coupled with lack of meaningful follow up resulted in non-recovery of sales proceeds of ₹ 19.07 crore including loss towards non-realizable dues of ₹ 23.48 lakh from three customers.

The matter had been regularly brought to the notice of BRIT by Audit since 2006 onwards. However no action was taken by BRIT till June 2016 when BRIT decided to supply radioactive materials to Universities and Research Institutes after obtaining advance payment. In the case of non-Government institutions having outstanding dues of more than ₹ four lakh, BRIT decided to stop future supply forthwith. BRIT also decided (from 01 April 2016) to include a clause in its invoices for levy of interest at the rate of 10.7 *per cent* if dues were not received within 30 days from the date of dispatch of the supply.

BRIT stated (February 2016) that proposal was being made for write off of the unrecoverable amounts. BRIT added (October 2017) that the outstanding amount had been reduced from ₹ 19.07 crore to ₹ 10.71 crore.

The fact, however, remained that failure to take timely action to establish an effective mechanism for recovering payments for its products resulted in outstanding dues towards sale of radioactive material amounting to ₹ 10.71 crore (as of October 2017) in 602 cases. Of this, ₹ 2.53 crore (318 cases) pertained to non-Government users.

The matter was referred to DAE in September 2017; its reply was awaited as of December 2017.

3.4 Irregular Leave Travel Concession claims

Nuclear Fuel Complex Hyderabad did not exercise stipulated checks before passing Leave Travel Concession bills of its employees which resulted in payment of ₹ 40.11 lakh towards irregular claims.

Rule 21 of the General Financial Rules, 2005, states *inter alia* that every officer is expected to exercise the same vigilance in respect of expenditure incurred from public moneys as a person of ordinary prudence would exercise in respect of expenditure of his own money and that expenditure from public moneys should not

be incurred for the benefit of a particular person or a section of the people unless (a) a claim for the amount could be enforced in a Court of Law, or (b) the expenditure is in pursuance of a recognized policy or custom.

Rule 2.30 of the Drawing and Disbursing Officer (DDO) Manual stipulates certain checks that are to be exercised by the DDO while passing Leave Travel Concession (LTC) claims including checking of serial numbers of tickets in order to safeguard the financial interests of the Government against fraud, misappropriation and inadmissible claims.

Test-check of vouchers in respect of LTC claims of employees of Nuclear Fuel Complex, Hyderabad (NFC), a unit of Department of Atomic Energy (DAE), for the period 2013-15 revealed that 32 cases of claims were submitted for e-tickets booked under LTC 80 scheme of Air India. However, the Boarding Passes for actual travels indicated different e-ticket numbers. This indicated that actual journeys were not performed against the LTC 80 tickets for which claims had been submitted by the employees. NFC however passed these such claims and made payment of ₹ 40.11 lakh to the employees.

Audit cross checked the travel details of the 32 employees from Air India and noticed that 31 persons had performed the journeys and the name of one employee, who had claimed LTC and was paid ₹ 0.86 lakh, did not appear in the travel details with Air India. It was also confirmed that 20 employees had claimed fares higher than actually paid to Air India and were paid excess amount of ₹ 15.02 lakh by NFC. For the remaining 11 employees, excess payment made could not be worked out due to non-availability of full travel details.

Thus, failure to exercise the stipulated checks before passing bills resulted in payment of ₹ 40.11 lakh towards irregular LTC claims including ₹ 24.81 lakh[21] in respect of the 21 cases whose travel details were confirmed from Air India and unverified payment of ₹ 15.30 lakh towards the remaining 11 cases which requires investigation.

The instances of payment of irregular LTC claims mentioned in this audit observation are those which came to notice of audit in the course of test checks of bills of LTC claims and do not exclude risks of similar other instances. Department may ensure that all the LTC claims are examined and verified again to obviate the possibility of similar irregularities.

DAE stated (October 2017) that it had been decided to refer the matter to Chief Vigilance Officer of the Department for investigation.

[21] ₹ 23.95 lakh towards claims made by 20 persons and ₹ 0.86 lakh towards payment made by one person whose name did not appear in the travel details with Air India.

CHAPTER – IV

Department of Bio-Technology

4.1 Activities of Institute of Bio-resources and Sustainable Development, Imphal

Institute of Bio-resources and Sustainable Development, Imphal could not achieve substantial progress towards achievement of its objective of bio-resource development and their sustainable utilization through bio-technological intervention for economic growth of the region even after a lapse of more than 15 years since its inception.

4.1.1 Introduction

Department of Biotechnology (DBT), Ministry of Science and Technology (MST), established the Institute of Bio-resources and Sustainable Development, Imphal (IBSD), in 2001 under the Manipur Society Registration Act, 1989, for conservation and sustainable utilisation of bio-resources for the socio-economic development of North Eastern Region. The primary objectives of establishment of IBSD were to study and document the unique biodiversity of the region, develop bio-technological interventions for sustainable development and utilization of bio-resources of the region and generate technological packages for employment generation and economic progress.

The affairs of IBSD are managed by its Governing Council (GC) whereas the Society is the apex body of IBSD for deciding policy, framework and general guidelines of its activities. The Scientific Advisory Committee (SAC) advises the institute on planning, policy formulation and identification of priority areas of research.

DBT released grant of ₹ 82.40 crore for revenue and capital against which an expenditure of ₹ 71.63 crore was incurred by IBSD during the period 2012-17.

4.1.2 Audit findings

Audit reviewed the activities of IBSD since its inception to March 2017. The audit findings are discussed in the subsequent paragraphs.

4.1.2.1 Setting up of state-of-art biotechnology research facilities

One of the primary objectives of IBSD was to create state-of-art biotechnology research facilities at Imphal. For this purpose, IBSD acquired (November 2007) 37.97 acres of land at Haraorou from the Government of Manipur for ₹ 10.18 lakh to establish the research facility. The Governing Council (GC) authorised (November 2012) IBSD to constitute an Expert Committee for the development of a

bio-resources Park. Subsequently, the SAC advised (September 2013) IBSD to constitute a committee to prepare a detailed plan of work.

Audit observed that that no committee was constituted by IBSD as advised by GC and SAC as of March 2017 due to which no time bound action plan for completing the work of development of the bio-resources Park could be prepared.

It was further observed that IBSD did not take action on most of the suggestions offered by SAC/GC for the development of the park from time to time as detailed in ***Appendix VIII***. Thus, even after lapse of more than nine years after procurement of land, IBSD could not establish the bio-resource park.

IBSD stated (May 2017) that due to change of the Director of the Institute, the committee was not constituted. The reply does not justify the delay of over nine years to prepare the project.

4.1.2.2 Non-formation of Institutional Bio-safety Committee

As per instruction[22] of Ministry of Environment, Forest and Climate Change (MoEFCC), an Institutional Bio-safety Committee (IBSC) was to be constituted by research institutions handling micro-organisms. The committee would comprise the Head of the Institution, Scientists engaged in DNA work, a medical expert and a nominee of DBT. The research institutions having micro-organisms should prepare, with the assistance of IBSC, an up-to-date on-site emergency plan. Further, experiments in the field of gene technology or micro-organisms may be carried out outside the laboratories but under the supervision of IBSC.

Audit observed that though IBSD conducted in-house research activity on animal/human pathogens and plant pests under micro-organisms which are categorised under different risk groups, it did not constitute IBSC as of March 2017. Consequently, emergency action plan was not prepared by the Institute. IBSD also carried out multi-location field trial experiment on Trichoderma and Pseudomonas without supervision of IBSC.

IBSD stated (August 2017) that though it had not constituted any IBSC, individuals working with infectious agents or biological agents were aware of the potential hazards, bio-hazard protocols and procedures and proficient enough in the practices and techniques required for handling such agents safely. The reply is not tenable as the rules on use and storage of hazardous micro-organisms were mandatorily required to be implemented by all institutions.

[22] Rule 4(3) of The Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organisms Genetically Engineered Organisms or Cells Rules 1989, Ministry of Environment, Forest and Climate Change Notification, New Delhi, dated 5 December 1989.

4.1.2.3 Non-availability of sophisticated system in bio-resource database and bio-informatics

Bio-resource database and bio-informatics division of IBSD is mandated to provide documentation of bio-resources of NER by using advanced computational tools and techniques and use of bio-informatics networks for maximum utilisation of the resources. SAC suggested (June 2011) an integrated biological activity study module for further *in-silico* analysis. The module was needed for *in-silico* data annotations for core research activities of the division. The bio-informatics division placed requisitions for procurement of sophisticated system for *in silico* analysis during 2010, 2011, 2012, 2014, 2015 and 2016 but the same was not procured as of March 2017.

Thus, the *in silico* analysis as advised by the SAC of the institute was not carried out due to which the research activities remained unachieved.

4.1.2.4 Study and documentation of biodiversity

Research activities of IBSD have been framed around four thrust areas viz., (a) Medicinal Plants and Horticultural Resources; (b) Microbial Resources; (c) Animal Resources, and (d) Bio-resources database and Bio-informatics. In order to fulfil the mission of development of unique bio-resources of the region and their sustainable usage for the socio-economic growth of the region, IBSD undertook various programmes on the study and documentation of the mega bio-diversity of the north eastern region. IBSD is also mandated to conserve the rich biodiversity of the region.

(i) Inadequate survey, collection and documentation of bio-resources

The status of survey, collection and documentation of the bio-resources to be undertaken by IBSD are summarised in Table 4.1 below.

Table 4.1: Survey, collection and documentation of bio-resources

Bio-resources	Programme/ Survey	Status
Plant Bio-resource	IBSD undertook a programme titled "Survey, Collection and Evaluation of the plant wealth in the Indo-Burma Biodiversity Hotspot" in 2003 under Plant Bio-resource research area. The objectives were (i) cataloguing and monitoring of bio-diversity and involving conservation strategies for rare/endangered species; (ii) collection, identification, documentation and diversity studies in the important cultivated crops of the region; and (iii) maintenance of herbarium of important horticultural and medicinal plant species.	a. Out of 249 species of orchids in NE India, only 18 species, constituting 7.23 *per cent*, have been collected and maintained in the Institute. b. No study had been started though SAC recommended (April 2002) for documentation of entire bamboo germplasm of NE India. c. Citrus species of only Manipur were collected, but no survey was conducted for the entire NE India. d. SAC (September 2007) recommended documenting the land races of cotton in entire NE India, but no document showing that the study had been initiated was on record.

Bio-resources	Programme/ Survey	Status
		e. Survey and collection and taxonomic identification of plants of only one family i.e. Zingiberacea (Ginger family) was almost completed. Among 88 species of the family, 76 species, constituting 87.5 *per cent*, have been collected and maintained in the Institute
Animal Bio-resources	During 2004-05, IBSD undertook the programme of collection of fish from Indo-Burma region for aquaculture and having ornamental value	a. 77 species of fish from only Manipur were collected and maintained in IBSD, but the collection of species was not made from entire NE India. b. Among 136 endemic fishes available in NE India, only 21 endemic species, constituting 15.44 *per cent*, were collected till date.
	In the tenth Society meeting (November 2010), IBSD was recommended to conduct diversity study and documentation of various snake populations prevalent in Jiribum area of Manipur and also to undertake study on nutritive analysis of different kinds of edible snails of NE region.	No such study was initiated as of March 2017. IBSD stated (May 2017) that it conducted snake venom study on two species of snakes. The reply is not tenable since this study is not in compliance with the recommendation of Society.
Ethno pharmacological[23] Survey and Documentation	IBSD undertook (2004-05) a programme with the objective, among others, to carry out survey and documentation of important medicinal and aromatic plants used in traditional/folklore medicines of NE India. IBSD took up (2009-10) another programme with the objective of ethno pharmacological survey and documentation of Manipur Traditional/Folklore Heath Care Practices. SAC suggested (June 2011) to confirm the validity and safety of traditional medicine practice in the entire NER. SAC further suggested (August 2013) to publish summary of ethno pharmacological survey in widely circulated journal of India and to bring out a database in the form of booklet/brochure/CD.	IBSD could only complete the ethno pharmacological survey which included medicinal and aromatic plants on Manipur traditional medicine of its nine constituent districts as a part of the programme undertaken in 2009-10. IBSD did not conduct ethno pharmacological survey and documentation of others states of NE India except Manipur.

Thus even after a lapse of almost 15 years, IBSD could not adequately survey, identify and document the unique bio-diversity of the north east region as mandated by its objective and recommended by its Committees.

[23] The scientific study of substances used medicinally, especially folk remedies, by different ethnic or cultural groups.

(ii) Shortage of Taxonomist for identification of bio-resources

In the third SAC meeting held in September 2004, the need for taxonomic identification of endemic and unexplored plant species of the region before initiating research activities of those species was emphasised. Further, in the SAC meeting of September 2007, it was observed that declining number of taxonomists had been the main problem in bio-diversity research and right persons needed to be picked up.

Examination of records revealed that IBSD had only one plant taxonomist. During the period from 2004-05 to 2016-17, a total number of 946 plant species were collected out of which 669 species were taxonomically identified leaving almost 30 *per cent* species unidentified. Audit further observed that the Animal Bio-resource Division under which research on insect and fish resources of NE India were carried out also did not have any animal taxonomist. The Insect Division carried out taxonomic identification with the use of taxonomic books and sent its specimens to other institutes for proper identification. As of 2016-17, 33 out of 41 species collected had been identified by this Division. Similarly, the Fish Resources Division had identified 68 of 77 species that it had collected.

Thus, the identification of species collected could not be completed due to shortage of taxonomists. Consequently, the objective of IBSD for study and documentation of unique bio-resources of NE region was not completely achieved.

(iii) Inadequate conservation efforts

SAC suggested (January 2007) developing a strategy for mapping bio-resources of entire the North East region and species that needed to be conserved. Audit observed that IBSD had no information to establish that mapping of bio-resources was carried out. The SAC/GC/Society offered suggestions on conservation of bio-resources from time to time (November 2004 to November 2005). Action taken by IBSD on these suggestions are detailed below.

a. For the long term conservation of unique germ plasm of the region, the Society advised (November 2004) IBSD to deposit one set of germ plasm samples collected by it with National Bureau of Plant Genetic Resources[24] (NBPGR), New Delhi, as core collection. The need for this was further reiterated by the GC which further advised (November 2005) IBSD to deposit elite genotypes of turmeric and ginger with the Regional Station of NBPGR at Shillong. IBSD stated (May 2017) that they had no information on this which indicates that no action has been taken by IBSD on the directives of Society.

b. IBSD hybridised 10 orchids during 2005-06. For conservation of these hybrid orchids, SAC advised (January 2007) IBSD to register the same with Protection of

[24] National Bureau of Plant Genetic Resources (NBPGR) under Indian Council of Agriculture Research is the nodal agency at national level for management of plant genetic resources (PGR).

Plant Varieties and Farmers' Rights Authority[25]. IBSD stated (May 2017) that efforts were underway for registration of two hybrid orchids.

c. IBSD collected 77 species of fishes and maintained them in its aquarium. Among these 77 fishes, 21 species are categorised as Near Threatened/ Vulnerable/ Endangered. Of these 21 species, it was observed that conservation efforts were taken up only in seven species.

d. The Society suggested (November 2005) that only endangered and threatened medicinal plants which were near extinction in the region should be selected and sustainable effort made for their conservation. IBSD stated (May 2017) that no information was available on the work carried out in this regard.

The above indicate that IBSD did not develop a strategy for mapping and conservation of bio-resources. IBSD also did not take action on the recommendations made by the various authorities in this regard.

4.1.2.5 Development of biotechnological interventions

Being one of the most important biologically sensitive hotspots in the world, the North East region is an active center of evolution of many new and novel gene pools. These gene pools contain valuable components and genes that can impart tolerance to drought, cold, frost, pathogens and pests. IBSD is mandated to play a role in ensuring that the rich bio-resources are converted into product and process i.e. technology.

IBSD undertook 30 programmes aimed at development of product and technology. Of these, nine were from Plant Bio-resource Division, 19 from Microbial Resources Division and two programmes were undertaken by Animal Resources Division.

Audit examination revealed that eight technologies **(*Appendix IX*)** were developed since inception by IBSD but none of these had been transferred to industries. Further, only three patents were filed since inception **(*Appendix X*)** but none of these was finally granted. In addition to above, SAC gave suggestions from time to time for undertaking specific research activity for product/technology development as detailed in ***Appendix XI***. It was, however, observed that no product/technology had been developed by IBSD on the recommendations of SAC.

Thus, the objective of bio-technological intervention for sustainable utilization of bio-resources remained largely unachieved. Failure to take action on the recommendations of the SAC defeated the purpose of monitoring and review by the committee.

[25] Protection of Plant Varieties and Farmers' Rights Authority has been established under Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPVFR). PPVFR is an Act of the Parliament of India that was enacted to provide for the establishment of an effective system for protection of plant varieties, the rights of farmers and plant breeders, and to encourage the development and cultivation of new varieties of plants.

4.1.2.6 Generation of technological packages

Society in its seventh meeting (October 2007) recommended that the Institute should involve industry at early stages of research planning and bring local entrepreneurs to work jointly with the Institute in utilization of bio-resources so as to develop products which had proven market demand. As per Action Taken Report on the seventh meeting of the Society, IBSD undertook two separate joint projects each with two private laboratories. However, the outcome of these two projects was not on record. Further, in the ninth Society meeting (November 2009), it was suggested that IBSD should develop programmes on Public-Private-Partnership (PPP) mode to deliver useful products and processes to the society. GC in its 14th meeting (November 2014) approved the creation of PPP by the Institute. However, no documents were on record to suggest that PPP mode programmes were undertaken by IBSD.

The matter was referred to the Department (October 2017); its reply was awaited as of December 2017.

4.2 Irregular grant of promotion and entitlement

National Centre for Cell Science, Pune, did not follow Government rules and orders in the matter of promotions to scientific staff under Flexible Complementing Scheme and foreign tours. This resulted in irregular payment of salary, transport allowance and for foreign tours totaling ₹ 93.26 lakh in violation of extant instructions.

4.2.1 Introduction

The National Centre for Cell Science, Pune (NCCS), an autonomous organisation of Department of Bio-Technology (DBT), serves as the national repository of animal cell cultures undertaking research in cell biology and human resource development. As of 31 March 2017, there were 146 personnel working in NCCS against the sanctioned strength of 197[26].

An audit review of management of the personnel and regulation of entitlement benefits brought out deviations from extant rules as discussed in the succeeding paragraphs.

4.2.2 Promotions

Based on recommendations of the Fifth Central Pay Commission, the Department of Personnel and Training (DoPT) issued Office Memorandum (November 1998) for

[26] As of March 2017, NCCS had 146 personnel working (Scientific-32, technical-72 and Administrative-42) against sanctioned strength of 197 (Scientific-55, Technical-94 and Administrative-48).

modifying the extant Flexible Complementing Scheme (FCS)[27] in Scientific & Technological Departments for in-situ promotion of Scientists/Technical personnel.

Audit observed the following:

(i) Promotion before completion of residency period

DoPT's Office Memorandum (OM) stipulated a minimum residency period in different scientific designations with relaxation in residency period for exceptionally meritorious candidates of not more than one year on any single occasion and limited to a maximum of two occasions in the entire career. As per the OM, the minimum residency period prescribed for promotion from Scientist 'E' to Scientist 'F' and subsequently to Scientist 'G' was five years. However, two Scientists[28] were promoted from Scientist 'E' to Scientist 'F' with relaxation of one and a half to two years in their residency period in violation of DoPT OM. This also caused subsequent promotions to Scientist 'G' before the due dates. Consequently, irregular payment of pay and allowances of ₹ 1.56 lakh were made to the two scientists.

NCCS stated (November 2017) that as per its prevailing Recruitment and Promotion Rules, the Assessment Committee of the NCCS was the competent authority to recommend relaxation in the residency period and its recommendations promoting the scientists were approved by its Director.

The reply is not tenable as provisions in Recruitment and Promotion Rules of NCCS could not violate DoPT's OM provisions on minimum residency period.

(ii) Grant of promotions with retrospective effect

DoPT clarified (July 2002) that promotions may not be granted with retrospective effect in FCS and reiterated this in September 2012 stating that giving the benefit of promotions from a retrospective date without timely assessment as prescribed in the guidelines of FCS would dilute the spirit of FCS instructions on rigorous assessment. Audit observed that 19 officials under scientific category were granted promotion/financial up gradation under FCS retrospectively in the Grade Pay (GP) ranging from ₹ 5,400 to ₹ 10,000 resulting in ineligible payment of ₹ 16.96 lakh to the beneficiaries of the scheme.

NCCS (November 2017) justified the retrospective payment on the ground of delay in grant of promotion due to lengthy and time consuming scrutiny of cases.

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[27] An in-situ promotion scheme for Scientists and Technologists holding Group-A scientific posts in Science and Technology Departments and who are engaged in scientific and technical activities and services.

[28] Shri A.K. Sahu promoted in November 2007 and Shri Debashish Mitra promoted in April 2006.

The justification is not tenable as the rules notified under the scheme contain provision for review of promotion by Selection Committee/Assessment Board twice a year and assessment of cases was to be completed before the due date of promotion as reiterated by DoPT in September 2012.

4.2.3 Entitlements

4.2.3.1 Inadmissible expenditure towards foreign tours

Ministry of Finance (MoF) issued orders (July 2011, May 2012 and September 2013) containing guidelines for expenditure management and economy measures which *inter-alia* stated that no proposal for participation in workshop/ seminar/ conference/ presentation of papers abroad at Government cost shall be entertained except those that are fully funded by sponsoring agencies. MoF clarified (August 2011) that these orders were applicable to autonomous bodies funded by Government of India.

Audit observed that during 2011-14, officials of NCCS went for workshop/ seminar/ conference/ presentation of papers abroad for which NCCS spent ₹ 27.05 lakh from its funds.

NCCS stated (November 2017) that up to 2013, cases of individual scientists for foreign tours were sent to the administrative Ministry i.e. DBT for approval. The DBT delegated (February 2013) this authority to Director, NCCS. Accordingly, cases of foreign tours were sanctioned considering the significance/need of scientists' visit in their research in order to bridge the gaps in knowledge, skills and performance.

The reply is not tenable in the light of Government of India instructions prohibiting such foreign tours.

4.2.3.2 Inadmissible payment of Transport Allowance

The Ministry of Finance (MoF) allowed (August 2008) slab-wise Transport Allowance of ₹ 3,200, ₹ 1,600 and ₹ 600 plus Dearness Allowance (DA) thereon to employees residing at A1/ A category cities and ₹ 1,600, ₹ 800 and ₹ 400 plus DA thereon for employees residing in other cities. Further, it stipulated that officers drawing GP of ₹ 10,000 and ₹ 12,000 and those in HAG+ scale, who were entitled to the use of official car in terms of OM dated January 1994 shall be given the option to avail themselves of the existing facility or to draw the Transport Allowance at the rate of ₹ 7,000 plus DA thereon per month and only Chief Executive of Statutory Bodies/ABs is entitled for use of staff car. MoF clarified (August 2016) that the officers not entitled for staff car in terms of the said OM dated January 1994 are not eligible for the Transport Allowance of ₹ 7,000 plus DA thereon even though they are drawing GP of ₹ 10,000 in PB-4 under dynamic ACP scheme or under the scheme of non-functional up-gradation.

Audit observed that higher rate of Transport Allowance of ₹ 7,000 was granted to 13 officials who were not entitled to staff car in terms of the extant instructions. This had resulted in excess payment of Transport Allowance of ₹ 47.69 lakh to these officials.

NCCS stated (November 2017) that payment of higher Transport Allowance of ₹ 7,000 and DA thereon to the non-entitled officials has been stopped. As regard recovery of excess amount already paid to these officials, NCCS informed that matter has been referred to the DoPT.

The matter was reported to the Department (October 2017); the reply of the Department was awaited (December 2017).

4.3 Non-utilisation of land procured for construction of staff quarters

National Institute of Immunology failed to utilize land acquired at a cost of ₹ 3.93 crore for constructing staff quarters even after lapse of 17 years resulting in avoidable payment of ₹ 35.89 lakh as penalty for delay in construction and pending liability of ₹ 41.14 lakh towards penalty.

In order to cater to the housing needs of its staff, the National Institute of Immunology, New Delhi (NII), an autonomous body under the administrative control of the Department of Bio-Technology (DBT), acquired (July 1998) a plot of land measuring 8,094 sq. meters at Dwarka in New Delhi from the Delhi Development Authority (DDA). NII paid (September 1998 and March/April 1999) ₹ 2.64 crore[29] to DDA as cost of land and took physical possession in May 2000.

As per the terms and conditions of the allotment letter issued by DDA, construction was to be completed within a period of two years from the date of taking over possession of the plot i.e. by May 2002. NII was also required to pay ground rent at the rate of 2.5 *per cent* per annum of the premium of land from the date of handing over possession of the site.

Audit noted that NII did not initiate any action to progress the project till February 2004 when it approached an architect for preparation of drawings/ building plans/ estimates for the staff quarters. The architect informed (April 2004) NII that as the time granted by DDA for construction of staff quarters had expired, extension of time was to be obtained from DDA. Accordingly, NII approached (June 2006) DDA for extension of time for completion of work. DDA granted (June 2007) extension of time upto December 2008 for completion of construction activities. NII failed to construct the quarters even within the extended duration and again approached (December 2008/July 2011) DDA for grant of further extension of time.

[29] Consisting of Premium of ₹ 2.58 crore and Ground rent of ₹ 6.44 lakh.

DDA granted (May 2012) extension of time upto December 2013 subject to payment of ₹ 1.42 crore (₹ 1.23 crore as composition fee for delay in construction and ₹ 19.31 lakh as outstanding ground rent). NII represented (May 2012) to DDA for waiver of ground rent and composition fees. Considering the request (May 2012), DDA waived (January 2013) 75 *per cent* of the composition fee and agreed to allow extension of time for construction work up to December 2013.

NII was yet again unable to undertake construction and approached (September 2013) DDA for further extension of time and full waiver of composition fee. DDA rejected the request of NII and informed (February 2014) that extension of time up to March 2015 could be granted only on payment of 25 *per cent* of composition fee. Accordingly, NII deposited (February 2014) the composition fee amounting to ₹ 30.50 lakh with a request for grant of extension of time up to March 2017.

DDA allowed (June 2014) extension of time up to December 2015 subject to payment of additional composition fee of ₹ 41.14 lakh. NII made (August 2015) another request to DDA for waiver of composition fee and extension of time up to December 2018 for completion of construction. DDA asked (October 2015) NII to furnish a certificate from a registered architect showing that 50 *per cent* of the construction had been completed to enable consideration of the request.

NII intimated (November 2015) DDA that construction of staff quarters had not yet commenced as the drawings of the proposed staff quarters were yet to be approved by DDA. In response, DDA asked (March 2016) for details of budgetary provisions made by NII for carrying out constructions activities in the said piece of land. NII had not made any provision for construction of quarters in its budget for the period 2001-02 to 2017-18.

As of August 2017, NII had made a total payment of ₹ 1.51 crore[30] on account of ground rent, composition fee and interest on delayed payments to DDA. Besides this, it had incurred (2015-16) expenditure of ₹ 20.86 lakh towards construction of boundary wall on the plot.

NII stated (May 2016) that DBT along with Delhi based autonomous institutions were in discussion for better utilization of procured land. It added that it had submitted a definite construction plan and had requested DDA for extension of time for construction activities which was pending with DDA.

Audit observed that NII did not have a definitive plan for construction of the staff quarters at the time when it sought, paid for and took possession of the land. This is clearly evident from the fact that there was no budget provision for this purpose between 2001-02 to 2017-18. NII appointed the architect for the work only in February 2004 which was more than three years after taking possession of the land. It submitted its building plan and drawings to DDA in July 2009. Consequently, land

[30] Ground rent ₹ 1.15 crore, composition fee ₹ 30.50 lakh and interest ₹ 5.39 lakh.

acquired in the year 2000 could not be utilized for its intended purpose for more than 17 years leading to idling of land acquired at ₹ 3.93 crore[31] and avoidable expenditure of ₹ 35.89[32] lakh towards payment of interest and composition fee. Besides, the demand of ₹ 41.14 lakh made by DDA remained unresolved and until the completion of construction, NII may continue to incur liability towards payment of penalty.

The matter was referred (November 2017) to DBT; it's reply was awaited (December 2017).

[31] Ground rent and cost of land/construction of boundary wall.
[32] Interest ₹ 5.39 lakh and composition fee ₹ 30.50 lakh.

CHAPTER – V

Department of Science and Technology

5.1 Avoidable expenditure towards price escalation

Indian Association for the Cultivation of Science, Kolkata incurred avoidable expenditure of ₹ 52.78 lakh and further liability of ₹ 31.01 lakh towards price escalation in the execution of a short term contract.

Rule 204 (viii) of the General Financial Rules, 2005, stipulates that a Price Variation Clause (PVC) can be provided only in long-term contracts where the delivery period extends beyond 18 months. Firm and fixed prices should be provided for in short-term contracts. In case where the PVC is provided, it should specify cut off dates for material and labour, ceiling on price variations and a minimum percentage of variation of the contract price above which price variations will be admissible.

The Indian Association for the Cultivation of Science, Kolkata (IACS), a scientific research institute under the Department of Science and Technology (DST), awarded (March 2009) the work of construction of upper three floors of its Library Building to M/s Hindustan Steelworks Construction Limited, Kolkata (HSCL), at a cost of ₹ 6.45 crore for completion within 18 calendar months from the date of commencement of work. The site was handed over to the contractor in April 2009 and the work was thus to be completed by October 2010. The work order included a clause providing for Price Variation Adjustment (PVA) due to increase or decrease in the cost of materials and labour on the work executed during the contract period including extensions.

The work was completed in June 2013 after delay of more than two and half years. IACS granted extension of time to HSCL on six occasions for different periods ranging from two to nine months after considering that the said delays were not attributable to the contractor. IACS released ₹ 6.71 crore to HSCL up to February 2017 towards execution of the work.

HSCL claimed a total amount of ₹ 83.79 lakh towards price variation out of which ₹ 52.78 lakh was paid by IACS and the remaining ₹ 31.01 lakh was approved for payment as of February 2017.

Audit observed that inclusion of the PVA clause in a short term contract with duration of less than 18 months was in violation of the GFRs. Further, grant of extensions to the contractor were justified by citing delays on the part of IACS in providing space for execution of work, finalisation of internal layout of electrical works and non-completion of works not within the scope of work of HSCL which was indicative of lack of due attention on the part of IACS in ensuring timely completion of activities

necessary to avoid cost overrun. This contributed to the price escalation to the extent of ₹ 83.79 lakh.

IACS stated (June 2017) that it was a long term contract as actual date of completion was 18 months. The reply is not tenable as the work order envisaged completion by 18 months and PVA clause could be incorporated only in contracts entered for completion period of more than 18 months.

The matter was reported to the DST in June 2017; their reply was awaited as of December 2017.

CHAPTER – VI

Department of Scientific and Industrial Research

6.1 Non-recovery of penal interest

Failure of Department of Scientific and Industrial Research to impose penal interest on delayed remittances of its share of income from projects funded to private industries resulted in non-recovery of ₹ 2.55 crore.

The Department of Scientific and Industrial Research (DSIR) sanctioned projects under the Technology Promotion Development and Utilisation Programme (TPDU)[33] to various private industries for development of technology and demonstration of process/products. As per the guidelines of the programme, a lump-sum amount of royalty amounting to 1.3 times the total amount of grants-in-aid released to it was to be remitted to DSIR in five annual instalments from the commencement of commercial sale of the products.

The National Research Development Corporation, New Delhi (NRDC), a Public Sector Enterprise under DSIR with expertise in transfer of technology, was identified for realisation of the lump-sum amount of royalty from private industries. For this purpose, DSIR entered (December 2002) into a Memorandum of Understanding (MoU) with NRDC which contained the terms and conditions relating to duties and responsibilities of both the parties. As per the MoU, NRDC was to license the technology and know-how developed through the projects to the executing agencies and would periodically collect lump sum and/or royalty payments, third party licensing fee, etc. due from the project executing agencies. An account of such payments including interest accrued thereon would be maintained by NRDC in a separate account and deposited in a separate 'No lien bank account'. The amount, so collected, was to be invested in short term fixed deposits. An annual statement of this account and the transactions made from this account was to be submitted to DSIR by the 15 April of every year.

The MoU also stipulated that 75 *per cent* of the net income pertaining to the lump sum and/or royalties, third party licensing fees, etc. and interest accrued thereon would be remitted to DSIR by 30th April of every year. NRDC was liable to pay a penal interest of 12 *per cent* per annum for any delay in remitting the payment to DSIR.

[33] A central scheme implemented by DSIR.

Scrutiny of records of DSIR revealed that a total of ₹ 46.13 crore was recovered by NRDC during the year 2007-08 to 2016-17 from different private industries on account of royalty. Of this, 75 *per cent* share of ₹ 34.60 crore was remitted to DSIR after delays ranging from 11 days to over three years[34]. The delay in remittance of DSIR's share of income made NRDC liable to pay penal interest of ₹ 2.55 crore for the period from 2007-08 to 2015-16.

Audit observed that DSIR did not pursue the issue of delay in remittance of the amounts due to it nor did it recover the penal interest of ₹ 2.55 crore for the delayed remittances. Further, NRDC neither maintained a separate account for such payments nor did it deposit the income in a separate 'No lien bank account' as stipulated in the MoU. NRDC also did not invest the amount in the short term fixed deposits as envisaged in the MoU. However, DSIR did not take any action to ensure compliance of the terms and conditions of the MoU entered into with NRDC. The inaction of DSIR in imposing penal interest on the delayed remittance of its share of income from the projects funded by it resulted in non-recovery of ₹ 2.55 crore. In addition, interest income was lost due to not investing in short term fixed deposits.

The matter was referred to DSIR (October 2017); its reply was awaited as of December 2017.

6.2 Management of Eleventh Five Year Plan projects of CSIR

Audit of 27 selected Eleventh Five Year Plan projects under the National Laboratory Scheme of Council of Scientific and Industrial Research revealed deficiencies in monitoring system in terms of non-constitution/ delayed constitution of the Task Forces/ Sectoral Monitoring Committees/ Research Councils and shortfall in the number of meetings these agencies had to conduct to oversee the implementation of the projects.

6.2.1 Introduction

The Council of Scientific and Industrial Research (CSIR) is an autonomous body under the Department of Scientific and Industrial Research (DSIR) which carries out scientific and industrial Research and Development (R&D). The Society of CSIR comprises of 28 members and is headed by the Prime Minister of India with the Union Minister, Science and Technology, as its Vice President and Director General (DG) CSIR as the ex-officio Secretary. The affairs of CSIR are administered, directed and controlled by a Governing Body (GB) which is headed by DG CSIR. There are 38 laboratories of CSIR located all over the country.

[34] Excluding the year 2016-17 in which no delay was observed.

During the Eleventh Five Year (2007-12) Plan (FYP), CSIR proposed programmes such as Supra-Institutional Projects[35] (SIP), Network Projects[36] (NWP), Inter-Agency Projects[37] (IAP) and Projects for Creation of Facilities[38] (PCFs). To manage these diverse R&D projects, CSIR formulated (October 2007) a generic guideline titled 'Guidelines on implementation, monitoring and financial governance of Eleventh FYP projects under National Laboratories Scheme' (Guidelines). During 2007-2012, CSIR undertook 97 projects at a total sanctioned cost of ₹ 2,650.39 crore[39].

An audit of the Eleventh FYP projects was conducted in 10 selected laboratories of CSIR based on geographical spread and a total of 27 projects (eight SIPs - ₹ 304.33 crore, 17 NWPs - ₹ 505.96 crore and two IAPs - ₹ 26.21 crore) with sanctioned cost of ₹ 836.50 crore to assess the effectiveness of monitoring of the projects with reference to the Guidelines. The selected laboratories, projects undertaken by these laboratories, approved cost of these projects and actual expenditure are given in ***Appendix XII.***

6.2.2 Inadequate monitoring

The Guidelines envisaged a two tier monitoring system for monitoring of the projects. At the Project Level, a Task Force (TF) was to be constituted for all the projects. In case of SIPs and IAPs where CSIR is the majority stake holder, Director of the Laboratory would constitute the TF under his Chairmanship with members from scientific groups involved in the project. In case of NWPs, the DG CSIR in consultation with the Director of the nodal laboratory will constitute the TF under his chairmanship with members from participating laboratories involved in the project**.** At CSIR Headquarters' Level, for NWPs, a Sectoral Monitoring Committee (SMC) was to be constituted by the DG CSIR consisting of eminent Scientist/ Technologist as chairperson, external experts, chairman of the Task Forces, Financial Adviser, CSIR and Head of Research Development and Planning Division, Network Projects (RDPDNWPs). In case of SIPs and IAPs, the monitoring is through Research Councils (RCs) of the implementing laboratories. In case of IAPs where the outside agency provided major share of budgetary support, implementation of the project would be from the concerned agency.

The TF was to formulate proposals for consideration by the GB/ Expenditure Finance Committee (EFC) detailing the activities including deliverables, milestones, financial

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[35] There is at least one overarching programme drawing strength and participation from a majority of the groups within the laboratory.

[36] The projects aim at networking of expertise, resources and facilities from more than one laboratory.

[37] The projects would involve synergy with the industry, academia and Government.

[38] The projects were formulated for creation of world class domain specific facilities in select laboratories to maintain internationally competitive knowledge generation capabilities in key technology areas.

[39] 33 SIPs (₹ 754.30 crore) *plus* 45 NWPs (₹ 1501.70 crore) *plus* 8 IAPs (₹ 139.20 crore) *plus* 10 PCFs (₹ 209.21 crore) *plus* one Project implemented by CSIR (₹ 45.98 crore).

phasing over the five years as well as outputs and outcomes of the projects in a proforma prescribed by Government of India. The TF shall prepare the micro details of the work plan of the project in terms of scientific outputs (patents, publications, etc.), activities and yearly/ half-yearly targets and quantifiable deliverables. The work plan as approved by GB would be submitted to the SMC in case of NWPs and RC in case of SIPs and IAPs for its consideration and endorsement.

The SMCs were to evolve suitable parameters in-consultation with the Task Force, review the physical progress of the project for achievement of the parameters on half-yearly basis, assess and advise the mid-course changes/corrections in the project to achieve the desired objectives, provide adequate internal warning mechanism for DG CSIR in case of projects registering no or slow progress and make suitable recommendations and provide periodic report to DG CSIR on the progress of the project.

TF and SMC were to meet at least two times in a year (once in six months) to review the progress of the Projects.

Audit noted that:

i) TF was constituted in only 10 out of 27 selected projects. In five of these 10 projects, the TFs were constituted after a delay of one year from the start of the project. In five projects, the TF was not constituted. In these five cases, the projects were monitored through Research Councils/ Laboratory. For the remaining 12 projects, the status of formation of TF was not available.

ii) In 17 selected projects under NWPs where SMCs were to be constituted, CSIR had constituted SMCs in only five cases. SMCs were not constituted in three cases and the status of formation of SMCs in the remaining nine cases was not known.

iii) There was shortfall in frequency of meetings for monitoring of the projects by TF and SMC as given in Table 6.1 below.

Table 6.1: Shortfall in conduct of meetings of TF and SMC where these were constituted

Nature of project	Task Force meetings		Sectoral Monitoring Committee meetings	
	Constituted	Range of short fall in conduct of meetings of TF (%)	Constituted	Range of short fall in conduct of meetings of SMC (%)
NWPs	7	30 to 70	5	80
SIPs	2	70 to 90	Not Applicable	
IAP	1	30	Not Applicable	

iv) The Guidelines stipulate that the TF shall send half-yearly performance report to DG CSIR by 15th September and 15th April of every year. However, no such

reports were submitted in two of the 10 projects where the TFs were constituted. In five cases, the shortfall in submission of reports was 80 to 90 *per cent*. In the remaining cases, the status of sending half-yearly performance reports to CSIR was not on record.

6.2.3 Non-submission of Project Completion Reports in the prescribed form

According to the Guidelines, Project Completion Reports (PCR) were to be prepared for all the projects in a prescribed proforma. The TFs of the respective projects are responsible for preparation of PCRs. The completion report shall be submitted to the SMC/ RC and the PCR with SMC/ RC remarks and approval shall be forwarded to DG CSIR. The objectives mentioned in the PCRs were to be the same as stated in the project proposal. The prescribed proforma of PCR shall also include details of objectives not achieved along with justification.

Audit noted that:

i) Though the PCRs were prepared in all 27 projects completed, TF had submitted the PCR in only two cases to the SMC/ RC. Further, the RC had reviewed and approved the PCR and forwarded the same to DG CSIR in only one of these two cases.

ii) Of the 27 PCRs prepared, 13 PCRs were prepared in the stipulated proforma while PCRs of 10 projects contained partial information. PCRs pertaining to four projects were not in compliance with the proforma prescribed by CSIR.

Deficiencies/ discrepancies noticed in the preparation of PCR are indicated below:

Project	Detail	Observation
SIP 001	Under the project, National Aerospace Laboratories (NAL) was to undertake 12 construction works under five disciplines at a total cost of ₹ 15.44 crore. During 2009-13, NAL spent ₹ 9.12 crore towards works and services leaving an unspent balance of ₹ 6.31 crore. It was mentioned that the objectives were achieved at the end of the project.	Audit observed that under Propulsion and Energy Systems discipline ₹ five crore was earmarked for setting up an experimental wind farm on 50 acres of forest land in Karnataka. However, the land procurement could not be pursued and hence civil works proposed for Avionics Integrated Test Facility, establishment of Wind Turbine Field test centre and Advanced Composite Technology Development Centre were not undertaken. However, NAL did not indicate these facts in its PCR and incorrectly stated that the objectives of the project had been achieved.
SIP 006	Under the project it was proposed to create a disease database (LSDB) that would catalogue the information available at different neurological centres across India.	Audit noted that the original source was redundant and the data was not maintained. As such, the facts were misrepresented in the PCR.

Project	Detail	Observation
	It was reported in the PCR that all promised deliverables of the project has been completed and the applicability of the basal variation database for few of the objectives has been successfully demonstrated.	
SIP 017	Under the project, National Physical Laboratory (NPL) proposed to construct a clean room facility (1,000 m^2) for housing of equipment of processing silicon cells and characterization of solar cells. It was reported in the PCR that the complete process line, diffusion furnaces and mask aligner could not be installed due to inadvertent procedural delays in Clean Room construction.	The project commenced in April 2007 and CSIR accorded (July 2007) in-principle approval for construction of clean room. The construction was scheduled to be commenced in September 2007 and completed by September 2008. NPL awarded the contract for construction of clean room to a firm in March 2008 and the work of construction was completed in May 2014. In the meantime, the project was completed in March 2012. As a result of non-completion of clean room within the project period, the equipment meant for installation in the clean room could not be housed. Further, couple of equipment worth ₹ 2.20 crore were received after the completion date of the project and six equipment worth ₹ 8.47 crore out of project cost of ₹ 14.63 crore were installed after the completion of project indicating lapses in monitoring and avoidable delays.
SIP 023	The objective of the project was development of technology based on porous and dense ceramic membranes in the energy and the environment sectors. The objective was grouped into five activities, envisaging development of one or more Intellectual Property Rights (IPR)/ Technology in each activity. From the PCR it was observed that in three activities no IPR was developed.	The justification for the same was not recorded.
SIP 026	One of the objective of the Project which started in March 2008 was developmental studies on malaria lead molecule 97/78 (collaborative cum licensing agreement with IPCA Laboratories Limited, Mumbai (IPCA)) and in the PCR (March 2012), it was mentioned that the objectives had been achieved and the Phase-I	CSIR entered (November 2004) into an agreement with IPCA for commercial manufacture of CDRI compound 97/78 as an anti-malarial agent. The said technology had already been developed and CDRI had entered (2004) into an agreement with IPCA Labs for further development of the product for commercial manufacturing. These facts

Project	Detail	Observation
	Clinical trial of Candidate drug 97/78 are underway in collaboration with IPCA.	were misrepresented as have been concluded under the current project (SIP 026) which is not factually correct.

6.2.4 Generation of Intellectual Property Rights

The guidelines of CSIR stipulate that patents, copy rights, trade mark, registered design, know-how for the process / product / design are included in intellectual property. In case of NWPs, where a number of CSIR laboratories were involved, it was stipulated that there should be a proper understanding and sharing of credits before beginning of the project between participating laboratories.

Audit observed that targets for Intellectual Property Rights (IPRs) were mentioned in project proposals of 18 projects. Out of a target of 171 IPRs proposed to be developed from these 18 projects, 78 IPRs were developed. It was further noticed that there was no mention of understanding and sharing of credits in the project proposals of any of the selected NWPs. Out of total 50 IPRs developed from 14 NWPs which proposed development of IPRs in the project proposals, only four patents were stated to be developed jointly.

6.2.5 Lack of action in involving industries for commercialization of technologies

Eleventh FYP projects under the National Laboratory Scheme aimed at generation of new knowledge which could be used for public goods, private goods, strategic goods and societal goods. It was stipulated in the Guidelines that industries were to be involved at a convenient stage as decided by the TF for effective commercialization of the research output. Business models adopted for commercialization of outputs of the projects should employ the same guidelines as those adopted by CSIR for all other projects. Valuation of intellectual property generated from the projects for commercialization was to be carried out as per the existing guidelines of CSIR for business models.

Audit observed that no efforts were made to involve industries and make them stake holders in 13 of the 17 selected NWPs. Further, deliverables in terms of 40 new technologies were proposed to be developed in 15 of the 27 selected projects. Against the 40, a total of 22 technologies were developed of which only nine technologies were commercialised and revenue of ₹ 46 lakh realised from these technologies after completion of the project.

6.2.6 Impact assessment of projects not done

The Guidelines stipulated that third party audit should be conducted of the PCRs to assess the achievements vis-a-vis the envisaged deliverables for further direction. Audit noted that third party evaluation of the PCRs was not done in 14 of the 27

completed projects as prescribed in the Guidelines. No information was available in respect of the remaining 13 projects.

6.2.7 Conclusion

Audit of 27 selected Eleventh Five Year Plan projects under National Laboratory Scheme of CSIR revealed deficiencies in monitoring with reference to the Guidelines issued in this regard. The Task Forces/ Sectoral Monitoring Committees/ Research Councils were either not constituted or constituted with delays. There was shortfall in the number of meetings these agencies had to conduct to oversee the implementation of the projects. There were deficiencies/ discrepancies in the preparation of Project Completion Reports. Action taken to involve industries with the projects for effective commercial exploitation of the technologies was absent.

The observations were sent to the DSIR in October 2017; their comments were awaited (December 2017).

6.3 Avoidable payment of electricity charges

Delayed action by Indian Institute of Chemical Biology, Kolkata, for reducing the contract demand resulted in avoidable expenditure of ₹ 64.90 lakh towards billing demand charges paid to West Bengal State Electricity Distribution Company.

An Institute intending to get electricity connection is required to apply in a prescribed format along with required documents to the distribution licensee. The application includes *inter alia* the requirement of load along with the basis of projection of the load. Based on site visit by engineers of the distribution licensee, the contract demand is sanctioned and institutions are required to deposit the prescribed Earnest Money Deposit and an agreement is signed between Head of the Institute and distribution licensee. The institute can change the contract demand once in a year based on the actual consumption/projections. It is the responsibility of the institute to periodically review the contract demand with reference to actual power consumption to avoid unnecessary expenditure on electricity.

The Indian Institute of Chemical Biology, Kolkata (IICB), a constituent laboratory of the Council of Scientific and Industrial Research[40], entered into an agreement (December 2011) with the West Bengal State Electricity Distribution Company Limited (WBSEDCL) for a contract demand of 1,000 KVA. As per the tariff order, demand charges are levied on actual maximum demand recorded in a month or 85 *per cent* of contract demand, whichever was higher, along with the charges for actual consumption at rates applicable from time to time.

[40] An autonomous society under Department of Scientific and Industrial Research

WBSEDCL commenced electricity supply to the Salt Lake premises of IICB from April 2013. IICB requested (December 2013) WBERC to reduce the contract demand to 200 KVA for next six months i.e. up to June 2014. WBSEDCL stated that as per extant rules, reduction of contract load/ downward revision of contract demand could be done after one year from the date of effect of service i.e. April 2014 and advised IICB to apply again before May 2014 for reduction of contract demand. IICB took up the matter again with WBSEDCL in December 2014 for reduction of contract demand to 200 KV but did not pursue the matter further and no reduction was actually effected.

Audit analysis of the electricity bills (May 2014 to March 2017) revealed that the actual consumption was persistently lesser by 58 *per cent* to 98 *per cent* than the contract load. On being pointed out by Audit in February 2017, IICB re-assessed (April 2017) the contract demand as 500 KVA and the same was reduced from 1,000 KVA to 500 KVA (May 2017)

Audit noted that had IICB pursued the reduction of contract load to 200 KV in April 2014 and ensured timely assessment of contract load after operationalising of its facilities in January 2016, the Institute could have avoided the excess expenditure of ₹ 64.90 lakh during May 2014 to March 2017.

CSIR stated (October 2017) that although attempt was made in December 2014 for reduction of contract demand to 200 KVA, it was not pursued as IICB could not assess the optimal requirement of electric load due to delay in implementation of various projects and scientific activities.

Reply is not tenable as IICB had the option to reduce or enhance the contract demand once in a year depending on status of implementation of various projects/scientific activities. Hence, failure of IICB to timely align its contract demand with their actual power consumption resulted in avoidable expenditure of ₹ 64.90 lakh which could have been utilised to meet other requirements of the Institute.

CHAPTER – VII

Department of Space

7.1 Operationalisation of Satellite Navigation System

NAVIC was approved by the Government of India in May 2006 at a cost of ₹ 1,420 crore to establish an independent and indigenous satellite based navigation system over the Indian landmass and surrounding region. An expenditure of ₹ 1,283.93 crore had been incurred on the programme so far. However, the system has yet to be operationalised due to delays in execution of contracts, deficient monitoring of programme and inadequate follow up. In addition, ₹ 3.57 crore were spent on unnecessary procurement of modems.

7.1.1 Introduction

Navigation with Indian Constellation (NAVIC)[41] is an initiative of the Indian Space Research Organisation (ISRO), Department of Space (DOS), to build an independent satellite navigation system to provide Position, Navigation and Timing (PNT) services over a Primary Service Area (PSA) comprising of India and its surrounding region extending up to 1,500 km. NAVIC envisaged applications in terrestrial, aerial and marine navigation, disaster management, vehicle tracking and fleet management, integration with mobile phones, precise timing, mapping and geodetic data capture, terrestrial aid for hikers and travellers and visual and voice navigation for drivers. ISRO identified (March 2006) Railways, land transport, mobile communication and general public as the potential civilian users and Defence and security applications as the non-civilian users.

NAVIC consists of a space segment, ground segment and user segment. The space segment comprises of a constellation of seven satellites (IRNSS-1A, IRNSS-1B, IRNSS-1C, IRNSS-1D, IRNSS-1E, IRNSS-1F and IRNSS-1G) which were launched between July 2013 and April 2016. The ground segment is responsible for maintenance and operation of the NAVIC constellation. The user segment comprises frequency user receivers capable of receiving NAVIC signals.

Government of India accorded (May 2006) financial sanction of ₹ 1,420 crore for NAVIC. As of March 2017, expenditure of ₹ 1,283.93 crore had been incurred under

[41] Initially known as Indian Regional Navigation Satellite System (IRNSS).

the programme. In addition, expenditure of ₹ 1,162.21 crore[42] was incurred on launch vehicles and maintenance of the satellites and the ground segment.

The Satellite Navigation Programme Office (SNPO) at ISRO Head Quarters was responsible for the overall coordination of the NAVIC programme. In addition, a Project Management Council (PMC) and a Project Management Board (PMB) were constituted (July 2006) for monitoring the progress of the programme.

An audit of the management of NAVIC was carried out covering the period 2012-17. Audit findings are discussed in the succeeding paragraphs.

7.1.2 Audit Findings

7.1.2.1 Non-operationalisation of NAVIC programme

The development and deployment of NAVIC constellation, ground infrastructure, navigation, safety and certification, verification software was expected to be completed within five to six years from the date of approval of the project i.e. by December 2011. However, the NAVIC programme was not operational as of June 2017 due to delays in realisation of various segments.

7.1.2.2 Delay in realisation of NAVIC components

Audit reviewed 45 contracts[43] awarded for realisation of various components under the three segments of the NAVIC programme. Of the 45 contracts, 37 contracts related to procurement of equipment and systems and eight contracts pertained to award of civil works. Audit observed delays in the execution of these contracts at each stage ranging from two years to nearly nine years. Audit also observed overall delay ranging from three months to more than nine years from the date of approval of the NAVIC programme in the completion of 11 components of the contracts as given in Table 7.1 below.

Table 7.1: Component-wise delay in execution of contracts for NAVIC components

Segment	Component	Purchase contracts (delay in months)			Works contracts (delay in months)		
		No.	Minimum delay	Maximum delay	No.	Minimum delay	Maximum delay
Space segment	(1) INC	-	-	-	6	39	118
Ground segment	(2) Navigational Software	1	-	31	-	-	-
	(3) Communication link	2	66	104	-	-	-
	(4) IRIMS	2	44	58	-	-	-
User segment	(5) IRNWT	2	38	101	-	-	-

[42] Includes cost of launch of the seven satellites: ₹ 1,117.06 crore; expenditure incurred towards maintenance of NAVIC satellites ₹ 42.75 crore; and expenditure incurred towards maintenance of ground segments ₹ 2.40 crore.

[43] All contracts that were directly related to NAVIC programme were selected for audit.

Segment	Component	Purchase contracts (delay in months)			Works contracts (delay in months)		
		No.	Minimum delay	Maximum delay	No.	Minimum delay	Maximum delay
	(6) IRCDR	6	3	111	2	69	73
	(7) SCC	4	69	112	-	-	-
	(8) Signal Monitoring	1	-	110	-	-	-
	(9) Atomic Clock	2	61	71	-	-	-
	(10) Other Space Consumables	8	25	116	-	-	-
	(11) User Devices	9	65	112	-	-	-

The delays were attributed to sites not being ready, revisions in the technical specifications, non-compliance with contract specifications by the contractor, administrative reasons, delays in shipment and delays in completion of civil works as tabulated in ***Appendix XIII***. While some of causes for the delay were unforeseeable and beyond the control of ISRO/DOS, a substantial part of the delays were attributable to inadequate follow-up, lack of coordination with Government and other agencies as well as sheer administrative laxity. As a result, the components could not be realised within the stipulated duration of the programme (December 2011) and 36 out of the 45 contracts remained unfulfilled as of December 2011.

Audit further observed that seven contracts remained unfulfilled even as of May 2017 after more than five years from the schedule date of completion of the programme. The delay in completion of activities under the contracts from 31 December 2011 as of 31 May 2017 is given in Table 7.2 below.

Table 7.2: Component wise delay in fulfilment of contracts in NAVIC

Segments	Components	Contracts Reviewed	Total no. of contracts unfulfilled at the end of Dec 2011	Range of delay in months up to 31 May 2017		Total no. of contracts unfulfilled at the end of May 2017
				Minimum	Maximum	
Ground Segment	INC	6	5	36	61	-
	Navigational Software	1	-	--	--	-
	Communication link	2	2	17	66	1
	IRIMS	2	2	21	25	-
	IRNWT	2	1	--	--	1
	IRCDR	8	5	13	63	-
	SCC	4	4	24	66	1
	Signal Monitoring	1	1	--	49	-
Space Segment	Atomic Clock	2	2	28	32	-
	Other Space Consumables	8	5	31	66	2
User	User Devices	9	9	15	66	2
	TOTAL	**45**	**36**			7

Thus, delays in award and execution of contracts for NAVIC components resulted in non-realisation/ delay in realisation of these components leading to non-operationalisation of NAVIC programme within the schedule duration and even after five years of the target date.

7.1.2.3 Delay in realisation of user devices development programme

ISRO identified (October 2004/ April 2006) development of user receivers as a critical technology component of the programme. The Cabinet sanctioned ₹ 200 crore for the development of critical technologies including user receivers.

In a PMC meeting held in May 2008, it was decided to explore the option of development of user receivers by a private agency and to enter into a development contract for this purpose. While ISRO procured (September 2012 to February 2017) user receiver equipment at a cost of ₹ 24.04 crore for various government agencies, academic institutes and ISRO centres for IRNSS field trials as well as three Global Navigational Satellite System (GNSS) simulators (June 2012 to August 2014) for testing of the user devices, the announcement of user development programme involving academia, research institutes and individuals for development of the user devices was initiated only in March 2017 with a budget allocation of ₹ 13.50 crore.

ISRO stated (September 2016) that development of the user segment was the responsibility of the user. The reply is not tenable as ISRO was required to develop critical technologies for the user receiver devices as approved by the Cabinet. The reply also contradicts the fact that the ISRO has eventually taken up the user development programme in March 2017.

7.1.2.4 Non-completion of performance evaluation

As per the approval of the Cabinet, certification of NAVIC was required to be done in order to provide seamless continuous PNT service to users. At its meeting held on 11 August 2009, the Project Management Board recorded that the characteristics of the user receivers have to be sent to the International Telecommunication Union (ITU) as per the regulations. The Project Management Council, in its meeting held in April 2016, stated that performance evaluation of IRNSS in the PSA was required to be evaluated in the Indian land mass and in places outside India within the PSA before NAVIC could be declared as operational.

Audit noticed that certification and validation of the NAVIC programme including performance evaluation was not done as of September 2016.

ISRO stated (September 2016) that evaluation and validation of NAVIC was in progress.

7.1.2.5 Unnecessary procurement of modems

Para 2.4.2 of DOS Purchase Procedure, 2009 stipulates that a Need Aspect Committee consisting of technical experts from the relevant field should examine the

need and appropriateness of specifications of equipment and systems proposed for procurement.

ISRO was to establish four IRNSS CDMA ranging stations (IRCDRs). In order to acquire ranging signals, the four stations required eight modems. There are two types of modems available in the market viz. SATRE and CORTEX. ISRO was in possession of both these modems for its various applications. While SATRE modems are used to acquire ranging signals from the satellites at Geo Stationary Orbit (GEO), CORTEX modems are required for satellites in both GEO and Geo Synchronous Orbit (GSO). Out of the seven NAVIC satellites, four satellites (IRNSS 1A, 1B, 1D and 1E) were positioned at GSO and remaining three satellites were positioned (IRNSS 1C, 1F and 1G) at GEO.

Space Applications Centre, Ahmedabad (SAC) procured eight (two modems in July 2007 and six modems in February 2008) SATRE modems from a foreign firm at a total cost of ₹ 3.57 crore. Subsequently in August 2016, ISRO Tracking, Telemetry and Command Network bought eight CORTEX modems from another foreign supplier at a cost of ₹ 2.98 crore on the ground that the previously acquired SATRE modems were not able to acquire ranging signals from satellites in GSO orbit.

Audit observed that the fact that four of the NAVIC satellites were in GSO must have been known to the Need Aspect Committee and this should have been taken into account while procuring the modems.

Failure of ISRO to match the procurement of the modems with the satellites resulted in unnecessary procurement of eight SATRE modems at a cost of ₹ 3.57 crore.

7.1.3 Conclusion

NAVIC that was to be operational by December 2011 was not made operational even at the end of June 2017 due to which position, navigation and timing services envisaged under the programme could not be provided to the users. Though the space segment has been completed, NAVIC remained non-operational due to non-completion of Ground segment and User segment. There were delays in realisation of key components under the programme which led to idling of the satellites. As the life of a navigational satellite is 10 to 12 years and the satellites already launched under the programme remained idle for 14 months to four years, delay in realisation of the NAVIC programme would limit the duration of their utility once the programme became operational. In addition, ground segment infrastructure created for the NAVIC satellites also remained unutilised.

The matter was referred to DOS in October 2017; its reply was awaited as of December 2017.

7.2 Infructuous expenditure on software development

Failure to implement and properly monitor a project on development of Digital Workflow System by the Department of Space resulted in non-development of the software for more than 11 years since its initiation despite expenditure of ₹ 2.27 crore.

The Department of Space (DOS) is responsible for promoting the development of space science and technology and space applications for national development. The Indian Space Research Organisation (ISRO) is the research and development wing of DOS and executes the Indian space programme.

DOS developed an in-house package named "Computerised Working in Administrative Areas (COWAA)" for computerisation of its Administration, Finance, Payroll, Purchase and Stores functions and deployed it across all its centres in a phased manner from 2002[44] onwards. With a view to bringing in radical changes in administrative work processes, live monitoring of ISRO projects, connectivity of all DOS/ISRO Centres/external agencies and to develop MIS services, DOS constituted (April 2006) an inter-centre Committee to undertake a detailed system analysis, process re-engineering and establishment of an integrated Digital Workflow System (DWFS) in all groups of administration.

The Committee submitted its report in January 2007. DOS issued (July 2007) orders envisaging that the DWFS would be built upon the COWAA system and would eventually replace COWAA in a phased manner. The development and implementation of DWFS was scheduled to be completed within 20 months i.e. by March 2009 at an estimated cost of ₹ 10 crore. DOS constituted (July 2007) a Project Management Council (PMC) to provide policy guidelines, approve the change management procedures and practices and review the project periodically for effective implementation. A Project Management Board (PMB) was also constituted (September 2008) for ensuring speedy development and implementation of DWFS.

The development of DWFS did not progress as envisaged. Since the progress was not satisfactory and the project functionaries requested for additional human resources, ISRO directed (July 2009) that three of its centres viz. Satish Dhawan Space Centre, Sriharikota (SDSC), Vikram Sarabhai Space Centre, Thiruvananthapuram (VSSC) and Liquid Propulsion Systems Centre, Valiamala (LPSC) would take the responsibility of development of DWFS. While SDSC was assigned 16 modules, VSSC and LPSC were entrusted with 10 and 13 modules respectively. In October 2009, DOS/ISRO constituted a Standing Review Committee[45] (SRC) and Verification and Validation

[44] The project was initiated in 1997.

[45] Committee constituted to review the (a) Software Requirement Documents; (b) Architectural Design; (c) Prototype Design; (d) Detailed Design; (e) Verification & Validation and Technical & Evaluation Committee Reports; (f) Change Control Board Recommendation.

Committee[46] (V&V) to review the Software Requirement Document, Verification and Validation and Technical and Evaluation Committee Reports and prepare Test Plan Document.

The progress of work continued to remain slow. The DWFS project teams reported (August 2015) that development of 80 *per cent* of modules allocated to SDSC was completed while the module development work entrusted to VSSC and LPSC was yet to start. It was also reported that out of the modules developed by SDSC, only the leave module was deployed in SDSC. However, this module was not deployed in other centres of DOS. The project teams stated that the progress of DWFS was hindered due to lack of in-house expertise, non-deployment of dedicated development team, other priority issues, non-identification of domain experts for work flow requirements and non-existence of review committees as many members had retired. Consequently, DWFS was not developed/deployed as of March 2017 though DOS had incurred an expenditure of ₹ 2.27 crore on hardware, software and consultancy.

Audit observed that the various review committees constituted by DOS did not perform the tasks envisaged. The PMC did not provide policy guidelines, approve the change management practices and review the project periodically. It held its first meeting in March 2008 when it identified the action items. It did not meet anytime thereafter to discharge the duties assigned to it. The PMB also did not ensure speedy development and implementation of DWFS. It held its last meeting in October 2010 and did not review the project thereafter. The minutes of this meeting indicated that DWFS was still being developed. The last meeting of the V&V was held in December 2010 and that of SRS in February 2011 indicating that the project was not pursued further.

Thus, poor monitoring of the project and failure to address the issues faced in project implementation in a coherent manner resulted in non-development of DWFS for more than 11 years since its conception despite expenditure of ₹ 2.27 crore.

The matter was referred to DOS (October 2017); its reply was awaited as of December 2017.

[46] Committee constituted for (a) preparation of standard template document for SRS, Design and Test Document; (b) review SRS document, Design Document; (c) prepare Test Plan Document, Test Cases; (d) Code Walk through.

CHAPTER – VIII

Ministry of Earth Sciences

8.1 Avoidable payment of rent for bonded warehouse

Centre for Marine Living Resources & Ecology, Kochi, stored unused and condemned items in a bonded warehouse and incurred avoidable expenditure of ₹ 1.03 crore towards rent of the bonded warehouse.

Section 49 of the Customs Act, 1962 provides that imported goods, whether dutiable or not, entered for home consumption, may be stored in a public warehouse for a period not exceeding thirty days if the goods cannot be cleared within a reasonable time[47]. In terms of Section 61 of the Customs Act, in the case of any goods other than those intended for use in any hundred *per cent* export oriented undertaking, the warehoused goods may be left in the warehouse in which they are deposited or in any warehouse to which they may be removed till the expiry of one year which may be extended by the Chief Commissioner of Customs for such period as he may deem fit. Sections 59 and 60 of the Customs Act state that the importer of goods which have been entered for warehousing shall execute a bond whereupon the proper officer may permit deposit of the goods in the warehouse.

The Centre for Marine Living Resources & Ecology, Kochi (CMLRE) is an attached office of the Ministry of Earth Sciences (MoES) which organizes, coordinates and promotes ocean development activities in the country. CMLRE rented (1984-85) space in the Central Warehousing Corporation (CWC) Kochi bonded warehouse for storing goods for future use on board the vessel FORV Sagar Sampada[48]. CMLRE stored its imported goods procured between 1985 to 2005 in the bonded warehouse. CMLRE occupied 69 sq.m. of open area and 235 sq.m. of closed area in the bonded warehouse.

Audit observed that most of the items were not consumed and were lying in the bonded warehouse. Further, the warehouse space was also used for storing condemned items which were to be disposed. As of April 2016, a total of 247 items valuing ₹ 1.11 crore were lying in the bonded warehouse out of which 52 items

[47] The Principal Commissioner of Customs or Commissioner of Customs may extend the period of storage for a further period not exceeding thirty days at a time.

[48] FORV Sagar Sampada is a research vessel owned by the erstwhile Department of Ocean Development. CMLRE was first started as Sagar Sampada Cell in 1991 and later on was formed as a full-fledged Centre.

valuing ₹ 2.50 lakh were condemned. These condemned items occupied an area of 174 sq.m. of the total area of 304 sq.m. constituting nearly 57 *per cent* of the total area. The items were yet to be disposed of as of January 2017.

During the period from 2009-10 to 2016-17, CMLRE incurred expenditure of ₹ 1.03 crore towards rent of the bonded warehouse. Engagement of a bonded warehouse for storing idle and condemned items was injudicious and the expenditure incurred on payment of rent for the warehouse was avoidable.

CMLRE stated (July 2015) that sufficient numbers of various items were ordered along with the vessel to suffice the requirements during the entire life of vessel as these items were not available in India. CMLRE added (April 2016) that the items were being stored in the bonded warehouse under Sections 49 and 67[49] of the Customs Act, 1962, and that these items have to be either kept on board FORV Sagar Sampada or in bonded warehouse ashore. CMLRE added (January 2017) that they were functioning from premises without any storage facility and hence had no alternative to the CWC facility.

The reply is not tenable as Sections 49 and 67 of the Customs Act were applicable only for goods which are stored in the warehouse pending clearance for home consumption. All the items stored by CMLRE under Section 67 and most of the items stored under Section 49 of the Customs Act were only scrap. Further, there was no record to indicate that bond was executed and specific orders of the proper officer as prescribed in Sections 59 and 60 of the Customs Act had been either sought or obtained for storing the items in the bonded warehouse for such extended periods of time. The reply of CMLRE citing non-availability of its own facility is in contradiction to its earlier statement (April 2016) that these items have to be either kept on board FORV Sagar Sampada or in bonded warehouse ashore.

Thus, storage of unused and condemned stores in the bonded warehouse resulted in avoidable payment of rent of ₹ 1.03 crore for the bonded warehouse.

The matter was referred to the Ministry (September 2017); its reply was awaited as of December 2017.

8.2 Irregular protection of pay

National Institute of Ocean Technology, Chennai, irregularly granted protection of pay of contract employees on their appointment on regular basis. This resulted in excess payment of pay and allowances of ₹ 1.97 crore to 44 employees.

Government of India order below Rule 22-B of the Fundamental Rules clarifies that since a temporary Government servant does not have a lien on any post, the pay of a person confirmed in a service/post will not be re-fixed with reference to the pay that

[49] Section 67 states that the owner of any warehoused goods may, with the permission of the proper officer, remove the goods from one warehouse to another.

the employee was drawing in the previous post held in temporary capacity but will be fixed in the scale of pay of the service/post.

The National Institute of Ocean Technology, Chennai (NIOT), an autonomous organization under the administrative control of Ministry of Earth Sciences (MoES) formulated (September 2000) Staff Service Rules stipulating various categories of staff such as regular staff appointed against sanctioned posts, contract staff appointed against sanctioned posts and ad hoc staff appointed on short term as per powers delegated to the Governing Council.

During the period from June 2006 to October 2009, NIOT made appointment of 58 persons, who were initially on contract basis. These employees were granted regular scales of pay with annual increments since their initial appointment on contract basis.

Scrutiny of pay fixation of these employees revealed that out of 58 contract employees appointed on permanent basis, the pay in 44 cases was fixed by taking into account the service rendered by the officials on contract basis and by protecting the basic pay drawn by them instead of fixing the pay at the minimum of the scale of pay/pay band. As the contracted employees did not have a lien on their earlier posts, the protection of pay was irregular and resulted in excess expenditure of ₹ 1.97 crore on the pay and allowances of these employees as of March 2017.

NIOT stated (September 2016) that the pay of the contract employees was protected based on the analogy of guidelines stipulated in Department of Personnel and Training (DoPT) Office Memorandum (OM) issued in August 1989[50]. NIOT added (November 2017) that these employees were in service for periods ranging from six years to nine years and they were drawing pay in the time scale identical to those holding similar positions on regular basis. However, based on audit observations, such protection of pay was not extended to staff who were regularized after October 2009.

The reply is not tenable as benefit of protection of pay cannot be extended to contract employees. The OM referred to by NIOT is related to protection of pay of regular employees working in Public Sector Undertakings, Universities, Semi-Government Institutions and Autonomous Bodies who were recruited into Government service and not contract employees.

The matter was referred to the Ministry (October 2017); its reply was awaited (December 2017).

[50] The DoPT OM stipulated guidelines for fixing the pay of candidates working in Public Sector Undertakings, Universities, Semi-Government Institutions and Autonomous Bodies who were recruited into Government service.

CHAPTER – IX

Ministry of New and Renewable Energy

9.1 Non-utilisation of Solar Thermal Power Plant

Failure to develop a dedicated workforce that could ensure continuous operation of a solar thermal power plant and research facility resulted in non-utilisation of the facility created at a cost of ₹ 46.36 crore.

Ministry of New and Renewable Energy (MNRE) sanctioned (September 2009) a Research and Development (R&D) project titled 'Development of a Megawatt-scale Solar Thermal Power Testing, Simulation and Research Facility' to Indian Institute of Technology, Bombay (IIT), at a cost of ₹ 41.17 crore. The project envisaged development of a national test facility at the National Institute of Solar Energy, Gurgaon[51] (NISE), that would enable testing of components and systems for solar thermal power generation. The project was expected to facilitate development of 1 MWe grid interactive solar thermal power plant. NISE was required to enter into a Power Purchase Agreement (PPA) with Dakshin Haryana Bijli Vitran Nigam (DHBVN) for sale of solar power generated. The project was sanctioned for a duration of five years i.e. up to September 2014. MNRE's Policy Guidelines of Research & Development projects stipulates that project completion report would be presented to the respective appraisal committees for final acceptance.

Based on the request of the Principal Investigator (PI) citing (May 2012) increase in cost of plant, consumables and contingencies, the sanctioned cost of the project was revised (July 2012) to ₹ 48.12 crore. The grid interactive solar thermal plant was installed (May 2014) at NISE and was feeding power to the grid. As the plant needed to be operated on a continuous basis, IIT requested (June 2014) for extension of the project for 10 months to enable smooth transition from the IIT team to NISE. IIT also requested MNRE to initiate the required activities towards this transition. Accordingly, the sanctioned duration of the project was further extended (September 2014) upto March 2015. An amount of ₹ 46.72 crore had been released by MNRE during 2009-15 for the project.

The plant was formally handed over by IIT to NISE with effect from 7 March 2015 and had generated nine Mwh of electricity up to 31 August 2015. The plant was operated

[51] A unit of MNRE formerly known as Solar Energy Centre, that was converted into an autonomous institution in September 2013 and renamed as the National Institute of Solar Energy.

up to August 2015 by human resources employed on contract basis by NISE. Thereafter, the contract was not extended for want of funds. As a result, the plant stopped functioning from September 2015. As of February 2016, a total expenditure of ₹ 46.36 crore had been incurred on the project. IIT refunded (June 2016) the unspent balance (with interest) amounting to ₹ 37.10 lakh to MNRE.

The project completion report submitted by IIT was reviewed (June 2016) by the R&D Project Appraisal Committee (RDPAC) of MNRE. The committee expressed satisfaction with the progress and achievement of the project but observed that the plant was not functional and that it should be handed over to NISE in operational condition. The committee also suggested that PIs should present the performance of the plant over an extended period of time and give their recommendations to facilitate the design of future solar thermal power plants. The committee concluded that the project completion report could not be accepted till it was revised based on its observations and till the plant was formally handed over to NISE in proper running condition.

The observations of the Committee were communicated to IIT in July 2017. However, no further action was taken on the project and the plant remained non-functional.

Grid interactive solar thermal power plant developed by IIT under the project

After the matter was raised by Audit (April 2017), MNRE convened (August 2017) a meeting with participants from NISE and IIT wherein it was decided that that the plant could be run on trial basis by NISE.

Audit observed that Ministry did not take any action to develop a dedicated workforce needed to run the plant on a continuous basis though the National Advisory Council constituted for the project in its meeting held in May 2011 had discussed the need for a dedicated workforce for running the plant once it was commissioned. The plant was taken over from IIT by MNRE before getting the project performance appraised by the RDPAC and without ensuring availability of dedicated workforce for its operation. Since the project was not completed, PPA could not be entered by the NISE with DHBVN.

MNRE stated (November 2017) that it was doing midway correction with NISE to improve the efficiency of the plant and to develop a national training facility which is already developed under this project. MNRE added that NISE had deployed five engineers who were working in the plant.

Audit noted that the Ministry took more than one year to take up the matter with IIT and NISE to resolve the issues raised by the RDPAC. As a result, the grid interactive solar thermal plant and experimental facilities developed under the project remained unutilised. Failure to develop a dedicated workforce that could ensure continuous operation of the solar thermal power plant and research facility resulted in non-utilisation of the facility created at a cost of ₹ 46.36 crore. Further, no action could be initiated for sale of 1 MWe solar power planned to be generated under the project.

CHAPTER – X

Central Public Sector Enterprises

10.1 Department of Atomic Energy

10.1.1 Irregular payment on leave encashment

Encashment of Half Pay Leave/Sick Leave in deviation from DPE guidelines, resulted in irregular payment of ₹ 10.53 crore during 2013-14 to 2016-17.

As per instructions issued by the Department of Public Enterprises (DPE) in April 1987, individual Central Public Sector Enterprises (CPSEs) may frame leave rules for its employees within the broad parameters of the policy guidelines laid down by the Government of India (GoI).

GoI allowed Half Pay Leave (HPL) and Earned Leave (EL) to be considered for encashment of leave on superannuation within the overall ceiling of 300 days with effect from 1 September 2008. In terms of DPE instructions of April 1987 ibid, CPSEs were required to follow the overall ceiling of 300 days for encashment of EL and HPL for their employees on retirement.

On 17 July 2012 , DPE clarified that sick leave could not be encashed and EL and HPL could be considered for encashment of leave on retirement subject to the overall limit of 300 days. These clarifications were reiterated on 17 December 2012 and 7 February 2014.

Indian Rare Earths Limited (IREL) deviated from the DPE guidelines on leave encashment and made irregular payments of ₹ 10.53 crore during 2013-14 to 2016-17 to their employees on account of encashment of sick leave, excess payment of encashment of EL/HPL over and above the ceiling of 300 days and payment of Dearness Allowance (DA) at full pay on encashment of HPL instead of admissible DA rate on half the rate of pay last drawn.

The company replied (July 2017) that the benefit of encashment of HPL and sick leave had been framed and implemented more than 30 years ago and had become part and parcel of the service conditions of the employees. It added (October 2017) that rules framed by GoI regarding credit as well as encashment of EL, HPL and sick leave are not applicable to IREL. The Board of Directors had decided (7 February 2013) to (i) continue with the existing rule of the company with respect to encashment of EL/HPL/Sick Leave to all employees on rolls of the company and (ii) frame rules for new entrants regarding encashment of EL/HPL/Sick Leave including maximum

number of days to be allowed for encashment on retirement as per DPE clarifications. Further after being pointed out by the Audit, company, however, revised (June 2017) the method of HPL encashment with immediate effect by allowing admissible DA on half the rate of pay last drawn.

The reply of the company is not tenable since leave encashment beyond the parameters of the policy guidelines of GoI was not permitted as per DPE instructions of April 1987. Further, DPE had specifically clarified (July 2012) that since Government guidelines do not permit encashment of sick leave, the same cannot be encashed by CPSEs and encashment of EL and HPL could be considered for encashment of leave on retirement subject to the overall limit of 300 days. Thus, encashment of sick leave, incorrect computation of DA in HPL encashment and encashment of EL and HPL on retirement beyond the overall ceiling of 300 days in respect of employees who joined before 6 February 2013 was in violation of DPE guidelines and the payment of ₹ 10.53 crore made during period 2013-14 to 2016-17 was irregular.

The matter was reported to the Ministry in September 2017; their reply was awaited (December 2017).

10.1.2 Additional burden of Income Tax/Minimum Alternate Tax due to non-renewal of Bulk Power Supply Agreement

The Company had to bear an additional burden on account of Income Tax/ Minimum Alternate Tax of ₹ 4.60 crore due to non-renewal of Bulk Power Supply Agreement with KSEB duly incorporating the provisions for recovery of incidence of income tax.

M/s. Nuclear Power Corporation of India Limited (Company) entered (December 2000) into a Bulk Power Supply Agreement (BPSA) for sale of power generated by its Kaiga Generating Station (KGS) Unit I & II with the Kerala State Electricity Board (KSEB) and four other Bulk Power Recipients (BPRs). The agreement was valid from 16 March 2000 to 15 March 2005 for Unit II and from 16 November 2000 to 30 June 2005 for Unit I.

As per the terms of the agreement, incidence of income tax liability on Company was not to be recovered from the BPRs. Further, in case the BPRs continued to get power after expiry of the agreement without further renewal or formal extension thereof, then all the provisions of the agreement shall continue to operate.

On expiry of the agreement, the Company renewed/entered into fresh agreements with BPRs during 2008 to 2011 (other than KSEB) and incorporated a clause for recovery of incidence of tax liability from BPRs from the Company. However, no renewed / fresh agreement was signed with KSEB as of January 2018 despite request from KSEB.

Audit observed that Company raised claims of ₹ 115.32 crore during 2005-06 to 2010-11 on four BPRs other than KSEB towards income tax/Minimum Alternate Tax (MAT) paid as per Income Tax Act in proportion to energy drawn. The claims were paid by the BPRs. However similar claim towards income tax/MAT amounting to ₹ 6.78 crore has not been settled so far by KSEB in the absence of related clause in the BPSA of December 2000.

Though KSEB agreed (June 2016) to consider the claim of the Company towards income tax/MAT as a gesture of good business relations, it stated (August 2016) that the claim cannot be considered by them legally since any payment towards tax, which is not backed by Power Purchase Agreement (PPA) with suitable clause for payment of income tax, would be objectionable.

Audit observed that Company had represented to KSEB in September 2007 and March 2008 for payment of incidence of income tax recovery which was not agreed to. During the same period, Company renewed agreement (February 2008) with one BPR (Tamil Nadu Electricity Board) which includes a clause on recovery of incidence of income tax. Thus, to protect its financial interest, Company should have taken timely action in year 2008 for renewing the agreement with KSEB and to include clause for incidence of income tax recovery as was included at the time of renewal with other four BPRs. It could then have recovered the incidence of income tax from 2008-09 onwards which amounts to ₹ 4.60 crore.

The Management stated (November 2017) that Company has decided to pursue the claim with KSEB and accordingly matter has been taken up with KSEB for recovery of claim.

Thus, Company had to incur an additional burden of income tax/MAT to the extent of ₹ 6.78 crore of which at least ₹ 4.60 crore could have been avoided had the Company taken timely decision in year 2008 to renew the BPSA with KSEB.

The matter was reported to the Ministry in October 2017; their reply was awaited (December 2017).

10.2 Department of Scientific and Industrial Research

10.2.1 Non-Compliance of DPE Guidelines

Irregular payment due to non-approval of incentive scheme and excess payment on account of encashment of Earned Leave to employees to the tune of ₹ 6.85 crore.

(A) Irregular Payment of Incentive to Employees

Department of Public Enterprises (DPE) clarified in November 1997 that "no ex-gratia, honorarium, reward, etc., would be paid by the CPSEs under the administrative

control of the Central Government to their employees over and above entitlement under the provisions of the Bonus Act or the executive instructions issued by the DPE in respect of ex-gratia unless the amount is authorized under the duly approved incentive scheme in accordance with the prescribed procedure". Further, employees drawing wage/salary exceeding ₹ 3,500 per month (increased to ₹ 10,000 per month w.e.f. April 2006 and to ₹ 21,000 per month w.e.f. April 2014) would not be paid bonus, ex-gratia, honorarium, cash reward and special incentive etc., unless the amount was authorized under a duly approved incentive scheme.

Audit observed that Central Electronics Limited (Company) did not have any approved scheme for payment of ex-gratia, reward, honorarium etc. However, it continuously paid Plant Performance Incentive (PPI)[52] to its employees which resulted in irregular payment of PPI of ₹ 3.77 crore during 2003-04 to 2015-16.

The Management replied (November 2017) that a new policy (Performance Incentive Scheme) has been drafted in place of existing system of payment of PPI for regular employees of Company who are out of the purview of payment of the Bonus Act, 1965. After implementation of the new scheme, the present system of PPI will be discontinued.

The Company has accepted the audit observation and framed a new incentive scheme which was approved (November 2017) by its Board of Directors. However, action for recovery of irregular payment ₹ 3.77 crore to employees on account of PPI for 2003-04 to 2015-16 is awaited.

(B) Excess Payment to Employees on Earned Leave Encashment

As per Department of Public Enterprises (DPE) instructions (April 1987), individual Central Public Sector Enterprises (CPSEs) could frame, with approval of their Board of Directors, leave rules for their employees within the broad parameters of the policy guidelines laid down by the Government of India (GoI).

Audit observed that the Company adopted 26 days as a month for the purpose of computing earned leave (EL) encashment instead of 30 days which was inconsistent with the Central Civil Service (Leave) Rules, 1972. Further DPE also clarified (December 2008) that in order to bring uniformity as to the method of calculation of encashment of EL across the CPSEs, the CPSEs should adopt 30 days a month for the purpose of calculating leave encashment. However, Audit noted that the Company paid EL encashment to its employees by considering 26 days in a month instead of 30 days in a month. This resulted in excess payment of ₹ 3.08 crore to its employees on account of EL encashment.

[52] Except for those who are eligible for bonus as per Payment of Bonus Act, 1965.

The Management stated (November 2017) that the Board has approved (April 2017) the method of calculation of EL encashment on the basis of 30 days in a month and the same has been implemented from June 2017.

While the Company has accepted the audit observation and changed the method of EL encashment in line with the DPE instructions, the fact remains that Company had made excess payment of ₹ 3.08 crore on EL encashment in contravention of DPE guidelines.

The matter was reported to the Ministry in October 2017; their reply was awaited (December 2017).

New Delhi
Dated: 05 February 2018

(MANISH KUMAR)
Principal Director of Audit
Scientific Departments

Countersigned

New Delhi
Dated: 06 February 2018

(RAJIV MEHRISHI)
Comptroller and Auditor General of India

APPENDICES

Appendix I (Refer to Paragraph 1.5)

Grants released to Autonomous Bodies auditable under Section 14 of Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 during 2016-17

(₹ in crore)

	Autonomous Body	Grants released in 2016-17
DEPARTMENT OF ATOMIC ENERGY		
1.	Harish Chandra Research Institute, Allahabad	34.43
2.	Institute of Mathematical Sciences, Chennai	57.46
3.	Atomic Energy Education Society, Mumbai	79.40
4.	Tata Institute of Fundamental Research, Mumbai	650.47
5.	Tata Memorial Centre, Mumbai	470.00
6.	Institute for Plasma Research, Gandhinagar	512.19
7.	Institute of Physics, Bhubaneswar	37.11
8.	National Institute of Science Education and Research, Bhubaneshwar	185.63
9.	Saha Institute of Nuclear Physics, Kolkata	118.51
DEPARTMENT OF BIO-TECHNOLOGY		
10.	National Brain Research Centre, Gurgaon	51.36
11.	National Centre for Cell Sciences, Pune	6.34
12.	National Institute of Immunology, New Delhi	3.36
13.	Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram	4.16
14.	Centre of DNA Finger Printing & Diagnostics, Hyderabad	4.01
15.	Institute of Bio-resources and Sustainable Development, Imphal	9.28
16.	Institute of Life Sciences, Bhubaneshwar	1.30
17.	Translational Health Science and Technology Institute, Faridabad	21.80
18.	National Agri-Food Biotechnology Institute and Bio-processing Unit, Mohali	0.50
19.	Institute for Stem Cell Research and Regenerative Medicine Bengaluru	42.10
20.	National Institute of Biomedical Genomics, Kalyani	42.72
21.	National Institute of Animal Biotechnology, Hyderabad	15.75
DEPARTMENT OF SCIENCE AND TECHNOLOGY		
22.	Aryabhatta Research Institute for Observational Sciences, Nainital	5.81
23.	Birbal Sahni Institute of Paleobotany, Lucknow	42.62
24.	Indian National Academy of Engineering, Gurgaon	1.18
25.	Technology Information, Forecasting and Assessment Council, New Delhi	8.27
26.	Vigyan Prasar, New Delhi	4.85
27.	Wadia Institute of Himalayan Geology, Dehradun	6.55
28.	Agarkar Research Institute, Pune	4.15
29.	Indian Institute of Geomagnetism, Mumbai	6.10
30.	International Advanced Research Centre for Powder Metallurgy, Hyderabad	11.03
31.	Indian Institute of Astrophysics, Bengaluru	7.84
32.	Indian Academy of Sciences, Bengaluru	4.68
33.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru	18.46
34.	Bose Institute, Kolkata	16.54
35.	Indian Association for the Cultivation of Science, Kolkata	46.03

	Autonomous Body	Grants released in 2016-17
36.	S N Bose National Centre for Basic Science, Kolkata	19.32
37.	Institute of Advanced Study in Science and Technology, Guwahati	10.25
38.	National Innovation Foundation, Ahmedabad	6.47
39.	Institute of Nano-Science and Technology, Mohali	0.18
DEPARTMENT OF SPACE		
40.	North Eastern Space Application Centre, Shillong	17.24
41.	Indian Institute of Space Technology, Thiruvananthapuram	76.50
42.	National Atmospheric Research Laboratory, Tirupati	26.40
43.	Physical Research Laboratory, Ahmedabad	131.37
44.	Semi-Conductor Laboratory, Chandigarh	234.00
MINISTRY OF EARTH SCIENCES		
45.	National Institute of Ocean Technology, Chennai	163.92
46.	Indian Institute of Tropical Meteorology, Pune	284.86
47.	Indian National Centre for Ocean Information Services, Hyderabad	103.03
48.	National Centre for Antarctic & Ocean Research, Goa	201.14
49.	Centre for Earth Sciences Studies, Thiruvanthapuram	18.22
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE		
50.	Central Pollution Control Board, Delhi	89.87
51.	G.B. Pant Institute of Himalayan Environment and Development, Almora	34.81
52.	Indian Institute of Forest Management, Bhopal	20.10
53.	Indian Council of Forestry Research and Education, Dehradun	163.20
54.	Indian Plywood Industries Research and Training Institute, Bengaluru	7.80
MINISTRY OF NEW AND RENEWABLE ENERGY		
55.	Centre for Wind Energy Technology, Chennai	25.00
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION		
56.	Polavaram Project Authority, Hyderabad	100.00
	TOTAL	**4,265.67**

Appendix II (Refer to Paragraph 1.6)

Outstanding Utilisation Certificates for the period ending March 2017

Ministry/ Department	Period to which grant relates	Number of utilisation certificates outstanding due by March 2017	Amount (₹in lakh)
Department of Atomic Energy	1991-2010	132	667.8
	2010-15	1,285	13,028.21
	2015-16	448	3,560.77
Total		**1,865**	**17,256.78**
Department of Bio-Technology	1993-2010	212	1,316.56
	2010-15	17,297	4,14,526.17
	2015-16	3,534	1,43,121.90
Total		**21,043**	**5,58,964.63**
Department of Science and Technology	2009-10	6,798	1,40,646.63
	2010-15	22,078	7,10,266.10
	2015-16	6,348	1,91,788.70
Total		**35,224**	**10,42,701.43**
Department of Scientific and Industrial Research	2005-10	104	16,640.49
	2010-15	657	1,12,644.16
	2015-16	108	8,042.65
Total		**869**	**1,37,327.30**
Department of Space	1976-2010	125	607.96
	2010-15	64	182.28
	2015-16	72	406.27
Total		**261**	**1,196.51**
Ministry of Earth Sciences	1983-2010	402	3,003.25
	2010-15	188	2,211.51
	2015-16	267	18,865
Total		**857**	**24,079.76**
Ministry of Environment, Forest and Climate Change	1994-2010	3,530	11,828.24
	2010-15	357	6,514.65
	2015-16	140	28,619.16
Total		**4,027**	**46,962.05**
Ministry of New and Renewable Energy	2005-10	29	608.88
	2010-15	160	18,273.50
	2015-16	580	1,65,632.11
Total		**769**	**1,84,514.49**
Ministry of Water Resources, River Development and Ganga Rejuvenation	1986-2010	108	893.46
	2010-15	99	33,453.89
	2015-16	60	1,94,829
Total		**267**	**2,29,176.35**
Grand Total		**65,182**	**22,42,179.30**

Appendix III (Refer to Paragraph 1.8)

List of Central Public Sector Enterprises under the Scientific and Environmental Ministries/Departments

Sl. No.	Name of the CPSE
Department of Atomic Energy	
1.	Anushakti Vidyut Nigam Limited- AVNL
2.	Bharatiya Nabhikiya Vidyut Nigam Limited
3.	Electronics Corporation of India Limited
4.	Indian Rare Earths Limited
5.	Nuclear Power Corporation of India Limited
6.	NPCIL – Indian Oil Nuclear Energy Corporation Limited
7.	NPCIL – NALCO Power Company Limited
8.	Uranium Corporation of India Limited/ UCIL
Department of Bio-Technology	
9.	Bharat Immunologicals and Biologicals Corporation Limited
10.	Biotechnology Industry Research Assistance Council
11.	Indian Vaccines Company Limited
Department of Scientific and Industrial Research	
12.	Central Electronics Limited
13.	National Research Development Corporation of India Limited
Department of Space	
14.	Antrix Corporation Limited
Ministry of Environment, Forest and Climate Change	
15.	Andaman & Nicobar Islands Forest and Plantation Development Corporation Limited
Ministry of New and Renewable Energy	
16.	Andhra Pradesh Solar Power Corporation Private Limited
17.	Himachal Renewable Limited, Shimla
18.	India Renewable Energy Development Agency Limited
19.	Karnataka Solar Power Development Corporation Limited
20.	Lucknow Solar Power Development Corporation Limited
21.	Renewable Power Corporation of Kerala Limited
22.	Rewa Ultra Mega Solar Limited
23.	Solar Energy Corporation of India Limited
Ministry of Water Resources, River Development and Ganga Rejuvenation	
24.	National Projects Construction Corporation Limited
25.	WAPCOS (India) Limited

Appendix IV (Refer to Paragraph 1.9)

Statement of losses and irrecoverable dues written off/waived during 2016-17

(Amount in ₹ lakh)

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	
	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
Department of Atomic Energy	-	-	-	-	22	8.37	-	-	-	-
Department of Bio-Technology	NIL									
Department of Science and Technology	NIL									
Department of Scientific and Industrial Research	NIL									
Department of Space	-	-	-	-	8	8.59	-	-	-	-
Ministry of Earth Sciences	Data not available									
Ministry of Environment, Forest and Climate Change	NIL									
Ministry of New and Renewable Energy	NIL									
Ministry of Water Resources, River Development and Ganga Rejuvenation	Data not available									
Total	**-**	**-**	**-**	**-**	**30**	**16.96**	**-**	**-**	**-**	**-**

Appendix V (Refer to Paragraph 1.11)

A: Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments as of December 2017- ATNs which have not been received from the Ministry/Department even for the first time

Sl. No.	No. & Year of Report	Para No.	Para title	Date of laying in the Parliament	Delay in submission of ATNs (months)
Department of Atomic Energy					
1.	30 of 2015	2.1	Implementation of Performance Related Group Incentive scheme	08.12.2015	20
Department of Bio-Technology					
2.	17 of 2017	3.3	Over payment of Transport Allowance	21.07.2017	1
Department of Scientific and Industrial Research					
3.	17 of 2017	5.1	Management of Human Resources in Council of Scientific and Industrial Research	21.07.2017	1
4.	17 of 2017	5.4	Avoidable expenditure due to non-disposal of unutilised land	21.07.2017	1
Ministry of Earth Sciences					
5.	17 of 2017	7.2	Irregular implementation of promotion scheme	21.07.2017	1
Ministry of Environment, Forest and Climate Change					
6.	39 of 2016	Standalone	Environmental Clearance and Post Clearance Monitoring	10.03.2017	5
Ministry of Water Resources, River Development and Ganga Rejuvenation					
7.	10 of 2017	Standalone	Schemes for Flood Control and Flood Forecasting	21.07.2017	1

B: Summarised position of the Action Taken Notes (ATNs) in respect of CPSEs awaited from various Ministries/ Departments as of December 2017- ATNs which have not been received from the Ministry/Department even for the first time

Sl. No.	No. & Year of Report	Para No.	Name of the CPSE
Department of Scientific and Industrial Research			
1.	9 of 2017	13.1	Central Electronics Limited
Ministry of Water Resources, River Development and Ganga Rejuvenation			
2.	9 of 2017	17.1	National Projects Construction Corporation Limited

Appendix VI (Refer to Paragraph 1.11)

Summarised position of the Action Taken Notes (ATNs) awaited from various Ministries/ Departments as of December 2017- ATNs on which Audit has given comments/observations but revised ATNs have not been received

Sl. No.	No. & Year of Report	Para No.	Para title	Date of issue of vetting comments on the ATN	Delay in submission of revised ATNs (months)
Department of Atomic Energy					
1.	22 of 2013	2.2	Hasty procurement of equipment without creating infrastructure facilities for installation	04.08.2017	4
2.	12 of 2016	2.2	Non-installation of Steam Turbine Generator	25.10.2017	2
3.	17 of 2017	2.1	Avoidable expenditure on purchase of medicine without tendering process	22.11.2017	1
4.	17 of 2017	2.2	Management of Human Resources in Autonomous Bodies of Department of Atomic Energy	27.12.2017	-
5.	17 of 2017	2.4	Irregular construction of residential flats and diversion of grant funds	27.12.2017	-
Department of Bio-Technology					
6.	5 of 2003	3.1	DBT Review	22.09.2017	3
7.	12 of 2016	3.1	Irregular administrative and entitlements operations	27.10.2017	2
8.	17 of 2017	3.1	Irregular expenditure on premises transferred to another organisation	23.11.2017	1
Department of Science and Technology					
9.	5 of 2004	3.1	Review of TIFAC	04.08.2017	4
10.	5 of 2005	5.1	Unfruitful expenditure during GTS-Bicentenary celebrations	25.10.2017	2
11.	13 of 2007	5.3	Internal controls in DST	25.10.2017	2
12.	CA 3 of 2008	5.2	Irregular extension of service	03.07.2017	5
13.	CA 16 of 2008-09	5.1	Non-recovery of dues despite development of technology	04.08.2017	4

Sl. No.	No. & Year of Report	Para No.	Para title	Date of issue of vetting comments on the ATN	Delay in submission of revised ATNs (months)
14.	CA 16 of 2008-09	5.3	Activities of Birbal Sahni Institute of Palaeobotany, Lucknow	14.12.2017	-
15.	27 of 2014	3.1	Fraudulent payment of legal fees	04.08.2017	1
16.	30 of 2015	3.2	Avoidable expenditure due to poor management of land and delayed construction of office complex	07.04.2017	8
17.	26 of 2016	Standalone	Administrative functioning of Autonomous Bodies under Department of Science and	25.10.2017	2
18.	17 of 2017	4.1	Inadequate implementation of National Map Policy 2005	30.11.2017	1
Department of Scientific and Industrial Research					
19.	5 of 1998	2.4	Loss due to defective agreement	04.08.2017	4
20.	22 of 2013	4.1	Public Private Partnership for setting up The Centre for Genomic Application by Institute of Genomics and Integrative Biology	14.12.2017	-
21.	29 of 2013	Standalone	Network Projects of Council of Scientific and Industrial Research for Tenth Five Year Plan	15.12.2017	-
22.	30 of 2015	4.1	New Millennium Indian Technology Leadership Initiative scheme	22.09.2017	3
23.	12 of 2016	4.1	Unfruitful expenditure on procurement of BSL-3 facility	12.04.2017	8
24.	17 of 2017	5.3	Non-operationalisation of Automatic Visual Range Assessor Systems	14.11.2017	1
Department of Space					
25.	12 of 2016	5.4	Loss due to delayed commissioning of equipment	10.08.2017	4
26.	17 of 2017	6.1	Management of VSAT services	30.11.2017	1
27.	17 of 2017	6.2	Irregular expenditure on pre-project activities	13.11.2017	1

Sl. No.	No. & Year of Report	Para No.	Para title	Date of issue of vetting comments on the ATN	Delay in submission of revised ATNs (months)
28.	17 of 2017	6.3	Lack of financial prudence and improper contract management in the delivery of commercial spacecraft	13.11.2017	1
29.	17 of 2017	6.4	Infructuous expenditure in purchase of ecologically fragile land	13.11.2017	1
Ministry of Earth Sciences					
30.	22 of 2013	8.1	Irregular introduction of pension scheme and diversion of funds	26.10.2017	2
31.	27 of 2014	5.2	Irregular payment of gratuity	31.07.2017	5
32.	30 of 2015	6.1	Unfruitful expenditure due to non-functional website	20.04.2017	8
33.	12 of 2016	6.1	Non-establishment of desalination plants and wasteful expenditure	23.10.2017	2
34.	17 of 2017	7.1	Non-recovery of fuel charges due to improper contract management	13.11.2017	1
Ministry of Environment, Forest and Climate Change					
35.	3B of 2001	1.0	Implementation of environment act relating to water pollution	31.07.2017	5
36.	21 of 2013	Standalone	Compensatory Afforestation in India	03.08.2017	4
37.	27 of 2014	6.3	Wasteful expenditure on hiring of office accommodation	13.09.2017	3
38.	30 of 2015	7.1	implementation of E-waste (Management and Handing) Rules, 2011 by central pollution Control Board	13.09.2017	3
39.	30 of 2015	7.2	Inordinate delay in completion of pilot projects for sewage treatment	03.08.2017	4

Appendix VII (Refer to Paragraph 3.1.2.2)

A: List of projects in which there was time over run

Projects	Original Scheduled date of completion	Revised date of completion	Actual date of completion	Time Overrun (As on 31 March 2017)	Reasons for time over run
1. Revamping of main cooling tower & Re-routing of cooling water return header at HWP, Manuguru	March 2012	June 2012	June 2012	3 months	-----
2. Replacement of unit-I & common unit DCS of CPP at HWP, Manuguru	March 2013	December 2013	December 2013	9 months	-----
3. Acquisition of land at the plant site of HWP, Tuticorin	August 2012	September 2012	September 2012	1 month	Marginal delay
4. Construction of Boundary wall and replacement of fencing oat HWP, Manuguru & Kota	September 2014	March 2015	March 2015	6 months	-----
5. Retrofitting/upgradation of electrical, mechanical & electronic instrumentation system at HWP, Manuguru	March 2016	March 2018	---	1 year	Delay due to repeated retendering for EHTC and non-acceptance of liability clause by suppliers for 6.6 KV VCBs.
6. Utilization of waste heat/low grade to generate refrigeration at HWP, Manuguru	March 2016	March 2019	--	1 year	Due to retendering and delay in approval from DAE for placement of order.
7. Revamping of existing integrated information system application along with IT infrastructure at HWB(CO) & HWP, Baroda/Kota/Manuguru/ Talcher/Tuticorin	March 2016	March 2019	--	1 year	Repeated tendering for IIS application software & delay in getting revised financial sanction from DAE. Approval for placement of Work Order on M/s ECIL through MoU for IIS revamping work is awaited from DAE.
8. Setting up of operator training simulator facility for Heavy Water production plants based on NH_3-H_2 & H_2S-H_2O exchange process	February 2015	March 2018	---	2 years and 1 month	Due to delay in approval from DAE for placement of order and developmental nature of job the work is getting delayed.
9. Retrofitting/upgradation of electrical, mechanical & electronic instrumentation system at HWP, Thal	March 2015	March 2018		2 years	Retendering due to high cost of HP valves, delay in finalization of specification of antisurge controller.
10. Replacement of control room instrument with DCS at HWP, Manuguru	June 2011	June 2016	June 2016	5 years	Retendered thrice due to receipt of inadequate offers and non-agreement of liability clause by supplier. Proposal for placement of PO and revised sanction cost were sent to DAE on 06.09.2013. Approval of the same was received from DAE on 29.03.2014. Accordingly, the placement of PO and schedule of work completion have got delayed. PO which was supposed to be placed in September 2013 was placed on 30.03.2013. Due to delay in placement of PO the schedule

Projects	Original Scheduled date of completion	Revised date of completion	Actual date of completion	Time Overrun (As on 31 March 2017)	Reasons for time over run
					date of commissioning of XU-I was postponed from March 2014 to March 2015 and XU-II including utilities was postponed from March 2015 to March 2016 as it depends upon the planned shutdown of the plant. Due to this, the schedule of completion has been delayed by approximately one year.
11. Extension of H_2S monitoring facility and environment survey facility at HWP, Manuguru	March 2016	March 2017	March 2017	1 year	Due to retendering of cables etc. the project got delayed.
12. Improvements in CPP by incorporating energy efficient systems/components/ equipment etc.	March 2016	March 2017	March 2017	1 year	Delay in execution of turbine retrofitting work due to backing out by the party has resulted in delay in execution of project.
13. Replacement of existing pneumatic instrumentation with electronic instruments and hooking up with DCS PLC system at HWP, Kota	December 2009	March 2014	March 2014	4 years and 3 months	Phase-I of DCS installations i.e. for XU & DU commissioning work completed by February 2010. Delay is attributed to supply of system and further development related to performance of system for safe & smooth operation of the plant.
14. Oxidation system for tritiated deuterium product from HEWAC facility at HWP, Kota	July 2012	July 2013	July 2013	1 year	Due to developmental nature of job and delay in approval of engineering document.
15. Setting up solar PV power plant at HWP, Manuguru to meet mandatory requirement of APERC	May 2014	January 2016	January 2016	1 year and 8 months	Due to heavy rain, Telangana separation agitation and delay in obtaining the clearance from Telangana state electricity board
16. Additional storage requirement for Heavy Water at Heavy Water Plants, Kota and Manuguru	March 2013	March 2014	March 2014	1 year	Delay in supply of tanks and delay in erection due to non-availability of crane.
17. Major repair/replacement of ESP internals (8 fields) and ESP controllers with microprocessor based system	March 2012	March 2014	March 2014	2 years	Delay was due to matching of the retrofit jobs during Major turnaround of plant.
18. Advanced Non-destructive Examination and condition monitoring facility at HWP, Baroda	March 2016	March 2017	March 2017	1 year	Due to embargo for supply of few of the items procurement delayed.
19. Development & implementation of efficient process for management of Sodium Sulphate at HWP, Kota & TDP, Chembur	September 2015	March 2019	--	1 year and 6 months	The file for Sodium Sulphate was retendered due to inadequate & technically not acceptable offers.
20. Pre-project activities for new Heavy Water production facility	October 2014	March 2019	--	2 years and 5 months	Due to delay in approval from DAE for placement of consultancy contract for DPR preparation for

Projects	Original Scheduled date of completion	Revised date of completion	Actual date of completion	Time Overrun (As on 31 March 2017)	Reasons for time over run
					Ammonia and Sulphide based Heavy Water Plant.
21. Retrofitting of 6.6 KV & 33 KV MOCB to VCBs- Phase-I at HWP, Manuguru	March 2012	March 2014	May 2014	2 years and 2 months	Delay due to poor response during tendering.
22. Procurement of double disc gate valve for HWP at HWP, Manuguru	March 2012	May 2014	May 2014	2 year and 2 months	Development of the valve indigenously through local supplier by giving sample valve from site has taken time
23. Installation of sheet metal structured packing in third stage hot tower of HWP, Manuguru	March 2011	August 2013	August 2013	2 years and 5 months	Based on the performance of structured packing in cold tower, packing for hot tower was procured and installed. Also delay in resolving the tax dispute between DPS and supplier.
24. Procurement of double disc gate valve for HWP, Kota	December 2011	May 2014	May 2014	2 years and 5 months	Development of the valve indigenously through local supplier by giving sample valve from site has taken time
25. Replacement of DG set at HWP, Kota	March 2012	October 2013	March 2014	2 years	Due to delay in placement of order due to delay in receipt of clarification from DG set supplier.
26. Effluent treatment plant for TBP plant at HWP, Baroda	March 2012	March 2013	March 2013	1 year	Due to developmental nature of project as this type of effluent is not available at other places.
27. Development of industrially suitable wet proof catalyst for isotopic exchange reaction involving hydrogen and water in collaboration with RRCAT , Baroda	February 2010	March 2013	March 2013	3 years and 1 month	Delay in freezing technical specifications as environmental monitors are not available in the market.
28. Enhanced fire /safety features/mitigation measures at HWP, Kota	March 2016	December 2018	--	1 year	The scheme was re-optimized and revised estimate was prepared. Administrative approval was received on 12-02-2015, after that procurement action was initiated. Thereafter, work is getting affected due to delay in supply of pipe and pipe fittings.
29. Project activities for production of rare material	March 2010	Continuing		7 years	There is delay in obtaining the sanction for main project the activities considered under the pre-project activities got delayed. Preparation of various documents like DPR, EIA, geotechnical studies etc. were delayed due to identification of suitable plot of land at proposed site. Environmental clearance was delayed as one of the proposed site location was under moratorium due to critical level of pollution. Consent application to various pollution control boards got delayed due to delay in obtaining the environmental clearances.

B: List of projects in which there was cost over run

(₹ in crore)

Sl. No.	Name of the project	Original Sanctioned cost	Revised cost	Cost over run	Reasons for cost over run
1	2	3	4	5 (4-3)	6
1	Utilization of waste heat/low grade to generate refrigeration at HWP, Manuguru	22.00	24.60	2.60	Due to delay in tendering process and obtaining necessary approvals from DAE.
2	Revamping of existing integrated information system application along with IT infrastructure at HWB(CO) & HWP, Baroda/Kota/ Manuguru/Talcher/ Tuticorin	10.00	14.00	4.00	Repeated tendering for IIS application software also the revised financial sanction is awaited from DAE.
3	Replacement of control room instrument with DCS at HWP, Manuguru	12.00	16.62	4.62	Retendered thrice due to receipt of inadequate offers and non-agreement of liability clause by supplier.
4	Installation of sheet metal structured packing in third stage hot tower of HWP, Manuguru	3.10	3.51	0.41	Delay in resolving the tax dispute between DPS and supplier
5	Replacement of DG set at HWP, Kota	1.81	2.50	0.69	Due to delay in placement of order due to delay in receipt of clarification from DG set supplier.
	TOTAL	**48.91**	**61.23**	**12.32**	

Appendix VIII (Refer to Paragraph 4.1.2.1)

Action taken by IBSD on suggestion on Committees in setting up of Bio-resource Park

Committee Meeting	Initiative suggested by SAC/GC	Action taken by IBSD
10th SAC meeting January 2011	To demarcate an area for plants for a butterfly zone in the Park	No area has been demarcated.
	To have germplasm conservatory of: (i) 'Zingiberaceae', (ii) 'Banana', (iii) Citrus, (iv) 'minor fruits' trees,(v) 'fuel wood' trees,(vi) 'insectivorous and parasitic plants',(vii) 'sericulture plants' and (vii) other 'useful endemic plants' of the region	Germplasm conservatory of only Zingiberaceae, Citrus and Orchids partially created
13th SAC meeting August 2013	To develop a "Signature Garden/Theme Park of Manipur" which could act as 'Manipur Tribal Plants Conservatory' having a collection of: (i) aquatic plants, (ii) indigenous dye-yielding plants, (iii) tannin yielding plants, (iv) poisonous plants, (v) edible insects and (vi) indigenous fishes.	Not developed
	To develop post-harvest demonstration facility on: (i) 'ginger', (ii) 'oleoresins from Capsicum' and (iii) 'essential oil extraction from aromatic crops'.	Not developed.
	To be developed as a show-piece or window of the Institution	The work was yet to be reviewed
12th GC meeting November 2012	To create bio-resource based entrepreneurship at the Park in order to promote bio-based enterprises in the region.	Work was at a preliminary stage.
15th SAC meeting August 2015	To create a state-of-the art Orchidarium at the Park	Tenders were floated and the process was on.
15th GC meeting October 2015	To create facilities for mass multiplication of few aromatic crops such as patchouli, geranium and vetiver etc. along with processing facilities at the Park	Work was at a preliminary stage.
	To create a National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited facility at the Park in order to provide value addition to the available resources	No such facility was created.

Appendix IX (Refer to Paragraph 4.1.2.5)

Details of technologies developed but not transferred to industry

Division	Product/technology developed	Year of development
Animal Resource	**1.** Breeding and seed production technology of Osteobramabelangeri (Species of ray finned fish)	2009-10
Plant Resource	**2.** Anti-arthritic formulations	2015
	3. Optimization of nursery agro-techniques out of niche environment at 800m above mean sea level of Valerianajatamansi with special reference to optimum sowing time, sowing/raising in different bed types and plotting of media.	2015-16
	4. Agro-techniques out of niche environment at 800 m above mean sea level for Valerianajatamansi for plant density per unit area	2015-16
Microbial Resource	**5.** Process and product for fermented soybean production using activated starter culture	2008
	6. Process and product of fermented bamboo shoot production using the selected starter culture consortium	2011
	7. Fibrinolytic enzymes from Bacillus subtillis production	2011
	8. Development of microbial bio-pesticides for the control of seed borne fungal pathogens and plant growth promotion using native Trichoderma viride.	2016

Appendix X (Refer to Paragraph 4.1.2.5)

Details of patents filed by IBSD but not granted

Division	Patent Title	Year of patent filing
Plant Resource	**1.** Non-pungent Pigments from Pungent chillies extraction, usage for cosmetic and dermatological products	2016
	2. An improved method for isolation and purification of Capsaicin, USP grade from pungent fruits of Capsicum spp.	2014
Animal Resource	**3.** A biofumigant comprising 2-Methyltetradydro-3- Furanone	2014

Appendix XI (Refer to Paragraph 4.1.2.5)

Outcome of recommendations of SAC on development of product and technology

Division	Suggestion by SAC	Audit observation
Plant Bio-resource	SAC in 9th Meeting (April 2009) suggested to carry out research work for technology generation on Citrus peel oil viewing its commercial prospect.	Technology was yet to be developed and extraction was done in lab scale only.
	SAC in 13th Meeting (September 2013) suggested to create the resource base of the elite variety of capsicum available in NER having good industrial demand and to develop a process for extraction of capsaicinoids and capsaicin form King Chilli.	IBSD could not create the resource base of elite variety of capsicum of NER due to hilly terrain and lack of transportation, local language problem, law and order problem and non-availability of suitable manpower and though the process for extraction of capsaicinoids and capsaicin from King Chilli had been developed and standardized at laboratory level but pilot plant validation of the same was not done.
	SAC in 13th Meeting (September 2013) suggested to determine vase life of ornamental ginger 'GlobbaSp' in order to have market value and to release one ginger ornamental flower as a product of IBSD by producing and putting at least 1,000 plants in the market within one year.	On being asked to intimate action taken on this, IBSD did not offer any comments.
Animal Bio-resource	In January 2011 SAC (10th Meeting) suggested to crossbreed between local earthworms with exotic earthworms for enhancing efficiency of local earthworms.	No action has been taken on this.
	In September 2014, SAC (14th Meeting) suggested to undertake outreach programme on fermented fish viz., Ngari, Cider to enhance the commercial value and also to give health tag to fermented food by conducting clinical trial to popularize fermented food among other communities and to avail support of good technologist and engineers for commercialisation.	The study on microbial dynamics on Ngari fermentation was carried out with the help of two indigenous Ngari producers and starter culture was designed, however, no study was initiated on Cider due to limited manpower and no health tagging was done and as such the process and products developed were incomplete.
Microbial Bio-resource	In June 2008, SAC (8th Meeting) suggested to develop fermented food product from cabbage for better profitability.	No work on this had been carried out.
	In April 2009, SAC (9th Meeting) suggested to develop bio-fertilizer for organic farming inputs for Mandarin Orange.	On being asked to intimate action taken on this, IBSD did not offer any comments.

Division	Suggestion by SAC	Audit observation
	In April 2012 SAC (12th Meeting) suggested to develop useful products derived from BGA collections.	In action taken report IBSD stated that a few nos of cyanobacteria were identified for commercial exploitation since the strains found to be at par commercial grade strains. However, no product has been developed.
	In April 2012 SAC (12th Meeting) suggested to translate fermented food of NER with proven health benefits into national food basket by improving hygiene, fermentation technology, large scale production and food packaging.	In-depth studies on the microbial resources associated with fermented soybean (Hawaijar), fermented bamboo shoot (Soibum), fermented fish (Ngari) and rice wine (Athingba) were carried out. However, since the processes and products were incomplete in the aspects of chemical composition analysis and health tagging, the final product/technology yet to be developed.
	In November 2006 Society (6th Meeting) advised IBSD to take up research work on biofuels as one of the priority area of research of the Institute. Further, in September 2016 Governing Council (17th Meeting) suggested among other to take up research programme on biomass/waste to energy.	The work is at preliminary stage and no product has been developed as of March 2017.
	In October 2006 SAC (5th Meeting) suggested to take up bioprospecting of cynobacteria for high value natural pigments and proteins such as phycocyanin and phucoerythrin.	No records showing the action taken of this was available with IBSD.
	In September 2007 SAC (7th Meeting) suggested to undertake a research programme on the diversity of micro algae as it have the potential source of biodiesel and biofuel.	No product has been developed out of this research programme as the Scientist assigned for micro-algal cultures however left the institute.

Appendix XII (Refer to Paragraph 6.2.1)

List of Eleventh Five Year Plan projects of CSIR laboratories selected for audit

Name of the project	Name of the institute	Approved cost of the project (₹ In crore)	Actual expenditure (₹ In crore)
1. Enhancement of knowledgebase in aerospace sciences and development of cutting age technologies (SIP-01).	National Aerospace Laboratories (NAL), Bangalore	99.67	85.14
2. New drug development programme for parasitic Diseases and Microbial Infections(SIP26)	Central Drug Research Institute (CDRI), Lucknow	29.88	26.80
3. Diabetes Mellitus – New Drug discovery R&D, Molecular mechanisms and genetic factors (NWP32)		33.78	33.49
4. Validation of Identified Models and Development of new alternative models for evaluation of new drug (NWP34)		18.50	18.42
5. Identification and validation of drug targets for selected pathogens (NWP38)		16.50	15.94
6. Advancement in Metrology (NWP-45)	National Physical Laboratory (NPL), New Delhi	136.81	135.73
7. R&D on Photovoltaics and other energy applications (SIP-17)		15.00	14.63
8. Fabrication of LED Devices and Systems for Solid State Lighting Applications (NWP-25)		47.88	47.59
9. Ceramic materials for emerging technologies involving liquid and gas separation (SIP-23)	Central Glass and Ceramic Research Institute (CGCRI), Kolkata	21.33	20.59
10. Non oxide ceramic based advance structural materials: Armours and Refractories (NWP-29)		14.50	13.19
11. Photonics for Communication, Sensor and Laser Technology (NWP-26)		19.99	19.77
12. Evaluation and Correction of Mitochondrial Dysfunction in Disease (SIP-07)	Indian Institute of Chemical Biology (IICB), Jadavpur	16.50	16.50
13. Engineering Peptides & Proteins for New Generation Therapies (NWP-005)		10.34	9.72
14. Development of Diagnostics and Target Based molecular Medicines against Allergy Bronchial Asthma and Chronic Obstructive Pulmonary Disease (NWP-33)		19.80	19.80
15. New insights in Cancer Biology identification of Novel Targets and Development of Target based molecular medicine (IAP-01)		9.27*	9.24*
16. Development of Specialty Inorganic Materials for Diverse Applications (NWP-10)	Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar	20.00	19.14
17. Mapping of the Marine Biodiversity along the Indian Coast (NWP-18)		9.00	8.25
18. Development of hollow fiber membrane technology for water disinfection/purification and waste water reclamation (NWP-47)		12.00	9.92
19. Science for development of a forecasting system for the waters around India (SIP-13)		72.45	66.02

Name of the project	Name of the institute	Approved cost of the project (₹ In crore)	Actual expenditure (₹ In crore)
20. Atmosphere carbon dioxide sequestration through fertilization of a high-nutrients-low-chlorophyll (HNLC) oceanic region with iron (NWP-14)	National Institute of Oceanography (NIO), Goa	15.00	15.00
21. To develop know-how and technology for environmental friendly conversion and utilization of biomass to fuels, lubricants and additives (SIP-19)	Indian Institute of Petroleum (IIP), Dehradun	35.00	31.63
22. An Integrative Biology Approach in Deciphering Genotype – Phenotype Correlation for Human Complex Disorders (SIP-06)	Institute of Genomics and Integrative Biology (IGIB), New Delhi	14.50	14.27
23. NCL-IGIB Joint Research Initiative : Interfacing Chemistry with Biology(NWP13)		21.50	21.50
24. Comparative Genomics and Biology of non-coding RNA in the human genome (NWP36)		38.00	35.39
25. Plasma Proteomics Health, Environment and Disease (NWP-04)	Centre for Cellular and Molecular Biology (CCMB), Hyderabad	33.61	33.61
26. Nano material and Nanodevices in Health and Disease (NWP-35)		38.75	35.38
27. Project for the conservation for the endangered species (IAP -02)		16.94	15.38
TOTAL		**836.5**	**792.04**

*Figures in respect of IICB alone. The total expenditure was not provided.

Appendix XIII (Refer to Paragraph 7.1.2.2)

Details of delays in purchase/work contracts under NAVIC

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
IRCDR Works							
1.	01-07-2006/ 29-11-2010/ 02-05-2011/ 15-01-2012/ 22-02-2013/ ISTRAC/CMD/CON/ Jodhpur/1060/ 11758 (₹ 1.59 crore)	Construction of IRIMS/ IRCDR Building at Jodhpur (Civil, PH, Electrical and A.C. works) (ISTRAC)	53.73	2.13	13.47	69.33	Reasons for delay in planning the work was not put on record by ISRO. Delay in execution of the jodhpur works were due to; (i) the delay in handing over of site (ii) construction of size stone masonry toe wall (iii) non-availability of sand due to ban by Rajasthan High Court (iv) Raising Finished Floor Level & Finished Ground level of building and (v) delay in supply and installation of 200KVA transformer.
2.	01-07-2006/ 13-10-2010/ 10-02-2011/ 23-08-2011/ 30-04-2013 ISTRAC/CMD/CON/ NE-SAC/TN-06/WO-09/2010-11/11423 (₹ 76.94 lakh)	Construction of IRCDR facility Building (Civil, PH, Electrical and Air conditioning works) at NE-SAC, Umium Meghalaya (ISTRAC)	52.17	1	20.53	73.70	Reasons for delay in planning the work was not put on record by ISRO. Delay in execution stage of the Meghalaya works were due to delay in cutting of trees (ii) construction of sump RCC retaining wall (iii) due to hold on 3 nos. column (iv) cold climatic conditions (v) non-availability of labour (vi) heavy rainfall and additional work.
* The civil works were to be ready expeditiously since the building was to house IRCDR equipment/ consumables. Therefore, RFP should be realised immediately after issue of financial sanction by DOS in June 2006.							
IRCDR Purchase							
3.	30-06-2007/ 16-07-2008/ 25-02-2009/ 31-03-2010/ 03-02-2013 20080002150101	11 M full motion antenna system (ISTRAC)	12.73	4.47	34.67	51.57	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
	(₹ 13.40 crore)						execution of this procurement was due to (i) heavy rains hampered access to sites as they were remotely located (ii) labour problems (iii) law and order problem, etc.
4.	30-06-2007/ 14-06-2007/ 21-02-2008/ 09-06-2008/ 03-02-2009 20070005600101 (₹ 1.80 crore)	SATRE modem satellite time & ranging equipment (SAC)	--	5.40	7.97	13.37	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.
5.	30-06-2007/ 28-12-2015/ 19-08-2016/ 18-10-2016/ 21-02-2017 2015E006970101 (₹ 3.70 crore)	Two Way CDMA Ranging Modem for IRCDR Station (ISTRAC)	103.43	4.83	4.20	112.46	Reasons for delay in planning the procurement was not put on record by ISRO. Delay of one month in execution of this procurement was on account of late issue of Letter of Credit by ISTRAC. However, reasons pertaining to the remaining period of delay was not put on record by ISRO.
6.	30-06-2007/ 03-04-2009/ 07-12-2009/ 18-05-2010/ 27-04-2010 20090000080101 (₹ 2.40 crore)	5071A High performance Cesium standard (clocks) (ISTRAC)	21.43	5.27	--	26.70	Reasons for delay in planning the procurement was not put on record by ISRO.
7.	30-06-2007/ 16-07-2008/ 25-02-2009/ 31-12-2011/ 03-02-2013 20080002150102 (₹ 3.10 crore)	11 M full motion antenna system (ISTRAC)	12.73	4.47	13.33	30.53	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) heavy rains hampered access to sites as they were remotely located (ii) labour problems (iii) law and order problem, etc.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
8.	30-06-2007/ 14-06-2007/ 25-07-2007/ 15-11-2007/ 26-02-2008 20060030830101 (₹ 60.99 lakh)	SATRE modem satellite time and ranging (SAC)	--	--	3.43	3.43	Reasons for delay in execution of the procurement was not found since the concerned purchase file was weeded out by ISRO.
* indents for procurement under IRCDR were to be raised within twelve months (three months for placing work order + nine months for completion of work) from 01 July 2006 i.e. by June 2007.							
IRNWT							
9.	30-04-2007*/ 17-07-2008/ 11-08-2009/ 28-06-2010/ 09-08-2011 20080002160101 (₹ 8.57 crore)	IRNSS NETWORK TIMING FACILITY (ISTRAC)	14.80	10	13.57	38.37	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to constant feedback (PDR & CDR) from ISRO after completion of various stages and subsequent modifications in design.
10.	31-01-2008#/ 17-01-2014/ 30-05-2016/ 30-07-2017/ incomplete as on 31-10-2017 20130003310101 (₹ 17.97 crore)	IRNWT-II at Lucknow (ISTRAC)	72.60	25.80	3	101.40	Reasons for delay in planning the procurement was not put on record by ISRO.
*indents for procurement of IRNWT-I (Byalalu) was to be raised within ten months (three months for placing work order + seven months for completion of work of INC-1) from 01 July 2006 i.e. by April 2007. # indents for procurement of IRNWT-II (Lucknow) was to be raised within nineteen months (three months for placing work order + sixteen months for completion of work of INC-2) from 01 July 2006 i.e. by January 2008.							
User Devices Simulators							
11.	01-07-2006/ 17-08-2011/ 28-06-2012/ 15-04-2013/ 22-03-2013 20110013750101 (₹ 3.57 crore)	IRNSS signal simulator development (SAC)	62.43	7.53	--	69.96	Reasons for delay in planning the procurement was not put on record by ISRO.
12.	01-07-2006/ 13-12-2013/ 21-08-2014/ 09-07-2015/ 16-09-2015 2013E002980101 (₹ 1.67 crore)	Design & Development of IRNSS SPS & GPS Simulator (SAC)	90.73	5.37	2.30	98.40	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
13.	21-05-2013/ 21-05-2013/ 26-11-2013/ 23-09-2016/ 23-09-2016 20130004770101 (₹ 51 lakh)	AMC of GPS simulator (SAC)	–	3.30	--	3.30	Reasons for delay in planning the procurement was not put on record by ISRO.
14.	01-07-2006/ 25-08-2011/ 07-02-2013/ 07-08-2013/ 23-12-2013 20110002440101 (₹ 2.53 crore)	IRNSS satellite L5, S signal simulator (ISTRAC)	62.70	14.73	4.60	82.03	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.
* The civil works were to be indented immediately after issue of financial sanction by DOS in June 2006.							
User Receivers							
15.	31-08-2007/ 20-01-2012/ 25-09-2012/ 25-03-2014/ 13-10-2014 20110022590101 (₹ 4.08 crore)	Development of IRNSS (SPS)_GPS user RXS. (SAC)	53.43	5.30	6.73	65.46	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was on vendor side to comply certain technical parameters.
16.	31-08-2007/ 19-07-2012/ 15-05-2013/ 31-01-2015/ 18-07-2016 20110027370101 (₹ 6.83 crore)	Development of IRNSS RS_GPS user receiver (SAC)	59.47	7	17.80	84.27	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to customizations requested by SAC, Ahmedabad which led to overall delay of shipment.
17.	31-08-2007/ 06-01-2014/ 22-01-2015/ 22-10-2015/ 18-04-2016 2014E003090101 (₹ 5.67 crore)	105 Units of NaVIC SPS, GPS and GAGAN receivers procured from M/s ACCORD, Bangalore (SAC)	77.33	9.70	5.97	93	Reasons for delay in planning the procurement was not put on record by ISRO. User receivers were to be delivered and installed at multiple locations. Delay in execution of this procurement was due to non-furnishing of these location details to vendor by SAC, Ahmedabad along with purchase order.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
18.	31-08-2007/ 08-07-2014/ 27-02-2015/ 14-11-2015/ incomplete as on 31-05-2017 20140014880101 (₹ 1.90 crore)	105 Units of NAVIC SPS, GPS and GAGAN receivers procured from M/s Data Patterns, Chennai (SAC)	83.43	4.80	18.80	107.03	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) change in specifications requested by vendor and confirmation of modification was given by SAC after three months (ii) more interaction in mechanical structure analysis and ADS simulation of RF board.
19.	31-08-2007/ 26-04-2016/ 20-02-2017/ 20-08-2017 2016E015390101 (₹ 5.40 crore)	100 Units of NAVIC SPS, GPS and GAGAN receivers procured from M/s ACCORD, Bangalore (SAC)	105.37	7	--	112.37	Reasons for delay in planning the procurement was not put on record by ISRO.
* indents for procurement of user devices were to be raised within fourteen months (three months for placing of simulators' purchase order + eleven months for completion of delivery of simulators) from 01 July 2006 i.e. by August 2007.							
INC							
20.	01-07-2006/ 01-02-2008/ 28-01-2009/ 10-08-2009/ 05-07-2010 ISTRAC/CMD/CON/IRNSS/ 1000/5987 (₹ 12.16 crore)	Construction of IRNSS complex at IDSN campus, Byalalu village Bangalore- Comprising of Civil, PH, Electrical and Air conditioning works (ISTRAC)	19.33	9.07	10.97	39.37	Reasons for delay in planning the civil work was not put on record by ISRO. Delay in execution of this work was due to; (i) delay in earthwork excavation in hard rock (ii) extension of roof slab in cafeteria building (iii) revision in top ring beam of Antenna supporting structure.
21.	01-07-2006/ 01-11-2013/ 17-01-2014/ 30-07-2014/ 27-12-2014 ISTRAC/CMD/CON/INC-2-LCK/1097/15416	Construction of substation, cable trenches & transformer foundation & fencing for INC-2	89.33	--	5	94.33	Reasons for delay in planning the civil work was not put on record by ISRO. Delay in execution of this work was due to; (i) delay in shifting of

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
	(₹ 1.04 crore)	Building, IRNSS facility at ILF, Lucknow (Civil & PH works) (ISTRAC)					substation (ii) delay in clearance for footing depths, design mix, testing material and cable trench routes and material.
22.	01-07-2006/ 01-11-2013/ 17-02-2014/ 02-06-2015/ 30-08-2016 ISTRAC/CMD/CON/INC-2-LCK/1097/15539 (₹ 6.61 crore)	Construction of INC-2 Building for IRNSS facility at ILF, Lucknow (Civil & PH works) (ISTRAC)	89.33	--	15.17	104.50	Reasons for delay in planning the civil work was not put on record by ISRO. Delay in execution of this work was due to; (i) delay in clearance for footing depths (ii) clearance for testing material (iii) modification of surveillance, managers, conference and engineer rooms.
23.	01-07-2006/ 16-09-2014/ 13-04-2015/ 27-12-2015/ 26-12-2016 ISTRAC/CMD/El/LCK/CON/WO-1/15-16/17817 (₹ 1.50 crore)	Construction of INC-2 Building for IRNSS facility at ILF, Lucknow- Electrical work – Internal electrification of External power supply (ISTRAC)	99.97	3.97	12.17	116.11	Reasons for delay in planning the civil work was not put on record by ISRO. Delay in execution of this work was due to delay in completion of civil works which caused this work to start late.
24.	31-01-2008**/ 16-03-2015/ 04-11-2015/ 18-03-2016/ 17-06-2016 ISTRAC/CMD/El/LCK/CON/WO-4/15-16/17802 (₹ 1.14 crore)	Construction of INC-2 Building for IRNSS facility at ILF, Lucknow- Electrical works – Supply Installation, testing & commissioning of 2x100KVA on line parallel UPS with battery backup (ISTRAC)	86.70	4.77	3.03	94.50	Reasons for delay in planning and execution of this work was not put on record by ISRO.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
25.	01-07-2006/ 16-09-2014/ 18-03-2015/ 31-08-2015/ 16-12-2016 ISTRAC/CMD/EI/LCK /CON/WO-3/14-15/17726 (₹ 1.73 crore)	Construction of INC-2 Building for IRNSS facility - Electrical works – Low tension electrical works at sub-station building, at ILF, Lucknow (ISTRAC)	99.97	3.10	15.77	118.84	Reasons for delay in planning the civil work was not put on record by ISRO. Delay in execution of this work was due to delay in completion of civil works which caused this work to start late.
* The civil works were to be indented immediately after issue of financial sanction by DOS in June 2006. ** RFP for UPS was to be initiated within nineteen months (three months for placing work order + sixteen months for completion of civil work) from 01 July 2006 i.e. by January 2008.							
Other Space Consumables							
26.	01-07-2006/ 08-07-2013/ 21-03-2014/ 21-07-2014/ 21-07-2014 2013E002100101 (₹69.24 lakh)	Vector Network Analyser (SAC)	85.47	5.53	--	91	Reasons for delay in planning the procurement was not put on record by ISRO.
27.	01-07-2006/ 11-06-2007/ 26-03-2008/ 26-05-2009/ 04-01-2010 20070006090101 (₹ 41.73 crore)	Traveling wave tube amplifiers (SAC)	11.50	6.63	7.43	25.56	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.
28.	01-07-2006/ 28-05-2008/ 12-03-2009/ 31-08-2010/ 10-09-2011 20080000800101 (₹ 9.65 crore)	Indigenous development, fabrication EPC (SAC)	23.23	6.60	12.50	42.33	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) diversion by the contractor of some components meant for this order to another SAC order (ii) delay in arrival of new components. (iii) non availability of testing facility at SAC for testing Qualifying Model units.
29.	01-07-2006/ 07-02-2013/ 13-06-2014/ 28-05-2015/ 05-04-2017 20120027300101 (₹ 2.88 crore)	Fabrication, testing & delivery of C-band Receivers (SAC)	80.43	13.37	22.60	116.40	Reasons for delay in planning the procurement was not put on record by ISRO.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
							Delay in execution of this procurement was due to delay in delivery of Free Issue of Material by SAC to the contractor.
30.	01-07-2006/ 25-07-2013/ 04-09-2014/ 12-08-2015/ 19-07-2016 20120027360101 (₹ 2.26 crore)	Fabrication, testing & delivery of L5 & S band modulators (SAC)	86.03	10.53	11.40	107.96	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to delay in submission of Bank Guarantee by the contractor for receipt of Free Issue of Material from ISRO.
31.	01-07-2006/ 01-10-2012/ 23-07-2013/ 02-12-2013/ 17-08-2015 20120016200101 (₹ 72.83 lakh)	6.3 m L& S Band antenna system with LNA assembly (SAC)	76.13	6.83	20.77	103.73	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was on the part of the vendor.
32.	01-07-2006/ 07-02-2013/ 31-07-2014/ 07-11-2015/ incomplete as on 31-05-2017 AHSN20120027350101 (₹ 3.28 crore)	L5 & S band Up-converter(IRNSS) (SAC)	80.43	14.97	19.03	114.43	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.
33.	01-01-2012**/ 23-09-2016/ 09-12-2016/ 30-06-2018 2016E022840101 (₹ 1.94 crore)	Assembly, Integration and Testing of two satellites (ISAC)	57.57	--	--	57.57	Reasons for this delay in planning the procurement was not put on record by ISRO.
* Indents for procurement of Other Space Consumables were to be raised immediately after issue of financial sanction by DOS in June 2006. ** indent for assembly, integration and testing of two ground spare NAVIC satellites was to be raised by 1 January 2012 i.e. after scheduled operationalisation of NAVIC programme by December 2011.							
Satellite Control Centre							
34.	01-07-2006/ 18-09-2007/ 20-03-2008/ 30-09-2009/ 26-02-2016 20070002480101	SUPPLY INSTALLATION AND COMMISSIONING OF 11m	14.80	3.13	78	95.93	Reasons for delay in planning the procurement was not put on record by ISRO.

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
	(₹ 11.40 crore)	Full Motion C-Band Antenna (MCF)					Delay in execution of this procurement was due to non-readiness of site at Bhopal.
35.	01-07-2006/ 18-09-2007/ 20-03-2008/ 30-09-2009/ 10-12-2013 20070002490101 (₹ 5.60 crore)	SUPPLY INSTALLATION AND COMISSIONING OF 7.2m Antenna (MCF)	14.80	3.13	51.07	69	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to non-readiness of site at Bhopal.
36.	01-07-2006/ 26-11-2013/ 20-05-2015/ 20-08-2016/ 31-03-2017 2013E001390101 (₹ 6.75 crore)	Supply and installation of 11M L/S band Full Motion Antenna (MCF)	90.17	15	7.43	112.60	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to subsequent modifications in design.
37.	01-07-2006/ 26-11-2013/ 24-09-2015/ 24-03-2017/ incomplete as on 31-05-2017 2013E001400101 (₹ 10.68 crore)	Installation of 11M FMA system with CIV (MCF)	90.17	19.23	2.27	111.67	Reasons for delay in planning and execution of the procurement was not put on record by ISRO.
* Indents for procurement of Space Control Centre equipment were to be raised immediately after issue of financial sanction by DOS in June 2006.							
		IRIMS					
38.	30-06-2007/ 17-02-2009/ 19-05-2011/ 13-11-2013/ 24-09-2013 20080005610101 (₹ 26.19 crore)	IRNSS reference receivers (IRIMS) (ISTRAC)	19.93	24.37	--	44.30	Reason for delay in planning the procurement was not put on record by ISRO.
39.	30-06-2007/ 09-03-2010/ 04-01-2012/ 28-06-2013/ 23-01-2014 20090006670101 (₹ 7.50 crore)	Development of indigenous reference receiver (ISTRAC)	32.77	19.20	6.97	58.94	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) non-availability of the project team from ISTRAC due to their preoccupation in pre and post launch activities (ii)

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
							reschedule of the CDR of the level 2 receiver.
* Indents for procurement for IRIMS receivers were to be raised within twelve months (three months for placing work order + nine months for completion of work of IRIMS) from 01 July 2006 i.e. by June 2007.							
Communication Link							
40.	30-04-2007*/ 12-12-2008/ 12-03-2010/ 30-07-2010/ 29-05-2013 20080004340101 (₹ 1.87 crore)	VSAT communication network (ISTRAC)	19.73	12.17	34.47	66.37	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to non-readiness of sites.
41.	31-01-2008#/ 16-03-2016/ 12-09-2016/ 17-03-2017/ incomplete as on 31-05-2017 2016E007490101 (₹ 3.43 crore)	Data communication network (IRDCN) establishment at INC-2 Lucknow (ISTRAC)	98.90	3	2.5	104.40	Reasons for delay in planning of the procurement was not put on record by ISRO. Due to the after effects of the demonetisation and banking related issues supplier could not complete the work in time.
***** indents for procurement of IRNWT-I (Byalalu) was to be raised within ten months (three months for placing work order + seven months for completion of work of INC-1) from 01 July 2006 i.e. by April 2007. **#** indents for procurement of IRNWT-II (Lucknow) was to be raised within nineteen months (three months for placing work order + sixteen months for completion of work of INC-2) from 01 July 2006 i.e. by January 2008.							
Atomic Clock							
42.	01-07-2006/ 16-02-2007/ 26-03-2008/ 11-09-2010/ 08-04-2014 20060073640101 (₹ 81.35 crore)	Rubidium atomic frequency standard (ISAC)	7.67	10.47	43.50	61.64	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) delay in obtaining export licence (ii) delay due to technical repairs.
43.	01-07-2006/ 31-07-2008/ 23-09-2008/ 24-11-2010/ 30-08-2014 20080009850101 (₹ 1.63 crore)	Development of Atomic Clock (SAC)	25.37	--	45.83	71.20	Reasons for delay in planning the procurement was not put on record by ISRO. Delay in execution of this procurement was due to (i) subsequent design modifications by SAC/ISRO (ii) delay

Sl. No.	RFP due date*/Date of RFP/Work Order date/Scheduled date of completion/Actual date of completion/ Work Order number and value	Description and concerned ISRO centre	Stage-I delay (in months)	Stage-II delay (in months)	Stage-III delay (in months)	Total delay (in months)	Reason for delay
							in procurement of critical raw material - Rubidium 87 isotope by NPL.
* Indents for procurement of Atomic clock were to be raised immediately after issue of financial sanction by DOS in June 2006.							
Signal Monitoring							
44.	01-07-2006/ 06-03-2013/ 24-06-2014/ 28-08-2014/ 11-01-2016 20120030600101 (₹ 2.06 crore)	DATA acquisition and recording system (SAC)	81.33	12.83	16.70	110.86	Reasons for delay in planning the procurement was not put on record by ISRO. Execution of this procurement was delayed due to Space Application Centre.
* Indents for procurement of Signal Monitoring System were to be raised immediately after issue of financial sanction by DOS in June 2006.							
Navigational server and software							
45.	30-04-2007/ 04-12-2009/ 11-03-2010/ 29-04-2010/ 01-04-2010 20090004850101 (₹ 2.44 crore)	IRNSS servers (ISTRAC)	31.63	--	--	31.63	Reasons for delay in planning the procurement was not put on record by ISRO.
* indent for procurement of Navigational servers and software was to be raised within ten months (three months for placing work order + seven months for completion of work of INC-1) from 01 July 2006 i.e. by April 2007.							