SUPREME AUDIT INSTITUTION OF INDIA
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Report of the Comptroller and Auditor General of India for the year ended March 2023

Union Government
Scientific and Environmental Ministries/Departments
Report No.29 of 2025
(Compliance Audit)

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Contents

Preface

This report of the Comptroller and Auditor General of India for the year ended March 2023 has been prepared for submission to the President under Article 151 of the Constitution of India. The report contains the results of the Compliance Audit of the Scientific and Environmental Ministries/Departments of the Union Government, their attached/ subordinate offices, Autonomous Bodies and Central Public Sector Enterprises.

The instances mentioned in this report are those which came to notice in the course of test audit for the period 2022-2023, 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 2022-23 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 (CAG) relates to matters arising from the compliance audit of the transactions of seven[1] Scientific and Environmental Ministries/Departments of the Government of India, as well as of autonomous bodies and Central Public Sector Enterprises under them. This Report contains nine paragraphs, three Subject Specific Compliance Audits (SSCAs)[2] and one Information Technology Audit relating to environmental issues, 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.

Subject Specific Compliance Audit of National Biopharma Mission

The National Biopharma Mission was an Industry-Academia Collaborative Mission preparing India's technological and product development capabilities in the biopharmaceutical sector to a level that it was globally competitive over the next 10-15 years and to transform the health standards of India's population through affordable product development. Sustained shortage of capacity within the Programme Management Unit from the outset of the Mission hindered its operations and oversight, contributing to delays, limited competition in project selection and insufficient coordination with other sectors. The Mission's objective was attempted to be achieved with very limited manpower. The Mission Steering Committee, established to provide high-level policy advice and to facilitate the coordination of project activities, had made many recommendations that could have played a pivotal role in achieving the envisioned outcomes of the Mission. These included developing an impact measurement matrix, a five-year roadmap for new products, capacity matrices for Scientific Advisory Groups and Technical Advisory Groups, strengthening laboratories, preparing techno-feasibility documents and engaging an independent agency for impact assessment. However, most of these recommendations were not followed up on by BIRAC. The Mission also struggled to fully implement the valuable policy guidance from the Technical Advisory Group, missing opportunities to strengthen its impact. Monitoring and evaluation processes did not function effectively. Audit noted that grants amounting to ₹5.46 crore were released without complying with milestone for release of payments as stated in the Grants-in-Aid

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[1] ***1. Department of Biotechnology (DBT), 2. Department of Science and Technology (DST), 3. Department of Scientific and Industrial Research (DSIR), all under the Ministry of Science and Technology, 4. Department of Atomic Energy (DAE), 5. Ministry of Earth Sciences (MoES), including the India Meteorological Department, 6. Ministry of Environment, Forest and Climate Change (MoEF&CC), 7. Ministry of New and Renewable Energy (MNRE).***

[2] ***Subject Specific Compliance Audit.***

Agreements. Addressing these shortcomings remains essential to realising the Mission's potential for India's biopharma sector.

(Para 2.1)

Recommendations

- ***The capacity requirements for the Programme Management Unit may be firmed up and strict contractual terms like signing of bonds, guarantees or obligations may be deployed to ensure that the personnel involved are retained till the end of the Mission, thus ensuring the successful achievement of Mission objectives.***

- ***BIRAC should set up a clear and reliable system to make sure that all recommendations from its main committees and advisory groups are followed up on in a timely and organised manner.***

- ***A shared understanding of the Mission objectives must be established at the decision-making level to ensure that the Mission delivers quick results within its remaining timeframe. A feedback mechanism should be established to review insights and lessons from unsuccessful projects.***

Blockage of funds to the tune of ₹1.43 crore

Lack of timely punitive measures by the Central Institute of Mining and Fuel Research resulted in non-achievement of intended objectives and blocking of ₹1.43 crore for more than five years.

(Para 3.1)

Unproductive expenditure to the tune of ₹0.78 crore

Central Mechanical Engineering Research Institute**,** Durgapur, procured one demonstrable prototype of Autonomous Underwater Vehicle up to sea operating depth of 1000 meters. The prototype was lying idle since its installation and was never demonstrated, which resulted in unproductive expenditure to the tune of ₹0.78 crore.

(Para 3.2)

Non-installation of Rainwater Harvesting System and Wastewater Recycling Facility

Due to non-installation of Rainwater Harvesting System and Wastewater Recycling Facility at CSIR National Physical Laboratory, 15 *per cent* rebate of water charges admissible on

such installation could not be availed. This led to avoidable payment of water charges of ₹1.14 crore.

(Para 3.3)

Unfruitful Expenditure of ₹1.58 crore incurred as Penalty

Indian National Centre for Ocean Information Services constructed and occupied buildings without taking Building Permission and Occupancy Certificate. This resulted in payment of penalty of ₹1.58 crore for the period 2014-15 to 2021-22.

(Para 4.1)

Non-realisation of ₹7.28 crore towards meteorological charges/statutory levies

Non-execution of Memorandum of Understanding/Letter of Agreement resulted in non-realisation of ₹7.28 crore towards meteorological charges/statutory levies from Nanded Airport Private Limited/IRB Sindhudurg Airport Private Limited.

(Para 4.2)

Avoidable payment of ₹0.73 crore due to inaccurate contract demand assessment

Inaccurate assessment of contract demand by Climate Research and Services, India Meteorological Department, Pune led to excess/avoidable payment of ₹0.73 crore.

(Para 4.3)

Subject Specific Compliance Audit of activities of Zoological Survey of India

The Strategic Plan of Zoological Survey of India from 2001 focused on conservation of biodiversity but was poorly executed, with delays of 1-16 years in surveys and research findings. Despite providing assurance against an earlier CAG report, ZSI did not develop a Survey Manual even after seven years, impacting the objectives of biodiversity conservation and taxonomic knowledge. Monitoring of faunal diversity lacked baseline data and ZSI made no effort to control invasive alien fauna. Due to recruitment inadequacies, 77 *per cent* of specimens from the last five years remained unidentified. Infrastructure to protect specimens was absent, disposal procedures were missing and slow digitisation hindered preservation. Non-upgradation of instruments and non-establishment of a Geographical Information System slowed progress.

(Para 5.1)

Recommendations

- ***Zoological Survey of India may review its performance vis-à-vis the Strategic Plan and intensify its efforts towards completion of Surveys and publication of its work as per a time bound action plan. MoEF&CC may closely monitor the functioning of ZSI to ensure that it delivers on its commitments.***

- ***Zoological Survey of India may prioritise studies and research to contribute to the prevention of further spread of the invasive fauna and the targets of the Vision Document may be included in the Annual Programme of Research.***

- ***Zoological Survey of India may establish a structured capacity building framework by creating a pool of taxonomic experts drawn from universities, research institutions and retired specialists at national and regional levels and by encouraging universities/institutions in promoting courses and specialisation in this field of study, to address subject-specific gaps in availability of trained manpower.***

- ***Zoological Survey of India may prioritise clearing the huge backlog of digitisation of specimens and take corrective action to compile the data base without errors.***

- ***Ministry may take urgent action on the proposal of Zoological Survey of India to upgrade the infrastructure so that all Regional Centres are adequately equipped for barcoding work and efficiency of the barcoding work can be increased.***

- ***Ministry may take appropriate action in signing MoU with other Departments so that the process of establishment of GIS and Remote sensing lab may be completed in a time bound manner.***

Non-utilisation of Clean Room constructed at a cost of ₹0.66 crore

Due to improper planning a Clean Room facility created at a cost of ₹0.66 crore for scientific research purposes by Bose Institute remained unutilised for more than five years.

(Para 6.1)

Irregular grant of additional increments by various units of Nuclear Power Corporation of India Limited/Bhartiya Nabhikiya Vidyut Nigam Limited

Nuclear Power Corporation of India Limited/Bhartiya Nabhikiya Vidyut Nigam Limited granted additional increment to its employees irregularly from November 2013 to June

2017. This practice was discontinued from June 2017 (date of issue of instructions by the Department of Atomic Energy) instead of November 2013 which resulted in irregular payment amounting to ₹8.92 crore.

(Para 7.1)

Non-settlement of Insurance claim for damaged equipment.

Madras Regional Purchase Unit, Chennai, did not maintain sufficient balance of premium with the Insurance Company, which resulted in repudiation of an Insurance claim of ₹0.56 crore on equipment that was damaged during transit.

(Para 7.2)

Information Technology Audit of functioning of Integrated Information System implemented in the Heavy Water Board, Department of Atomic Energy

The Group B modules of the Integrated Information System (IIS), covering core functions like plant status reporting and maintenance management, were not utilised by Heavy Water Board and Heavy Water Plants as of September 2023, over two years after the Go-live Date. This showed that the main objectives of IIS were unmet, with reliance on the older IIS and manual processes risking errors. Group A modules, like HR and payroll, were partially implemented but had significant deficiencies. Governance Committees failed to review Group A and B modules' progress, gaps in User Requirement Specification, application controls and information security. Without full module utilisation, Heavy Water Board was unable to achieve IIS benefits like operational efficiency and data integrity, delaying a fully automated system.

(Para 7.3)

Recommendations

- ***HWB should prioritise the full implementation, impart necessary training to users and mandate the utilisation of all Group B modules.***

- ***HWB should direct the Governance Committees for IIS to meet at prescribed frequencies and maintain clear documentation on progress in implementation, identification of risks and recommendation of mitigation measures to achieve the revised timelines for full utilisation of the system as intended.***

- ***HWB should implement application controls in IIS to enforce the business rules for various sub-modules under both Group A and Group B modules.***

- ***HWB should review the list of sub-modules not yet implemented under the Group A modules and obtain necessary approval from the Competent Authority in case any of the sub-modules are no longer required.***

Subject Specific Compliance Audit of activities of the Board of Radiation and Isotope Technology

The Board of Radiation and Isotope Technology **(**BRIT**)** was unable to properly monitor and implement nine projects during 2003-04 to 2022-23 that led to both time and cost overruns. Poor monitoring of the projects led to their slow execution, resulting in many deliverables of the projects becoming obsolete and abandoned. Further, BRIT failed to recover outstanding dues for its products from its customers, resulting in outstanding dues amounting to ₹152.47 crore as of September 2024. BRIT did not comply with the regulations of tax authorities in time, which led to tax liabilities amounting to ₹62.04 crore, including service tax, excise duty, cess, interest and penalties. Proforma accounts of BRIT were not prepared since inception till 2015-16, without which the Board's true financial status could not be determined. BRIT also incurred irregular expenditure of ₹1.34 crore on development of e-portal. The mobile application BRIT Bandhu also could not become functional since its inception, leading to an ineffective sales and management system. BRIT is issuing test certificates of radioactive isotopes of Cs-134, I-131, Ru-103 and Ru-106 without following any approved procedures.

(Para 7.4)

Recommendations

- ***BRIT may adhere to the timelines prescribed for conducting meetings of its various committees so that corrective actions on its projects/activities can be taken in a timely manner.***

- ***BRIT may monitor the project timelines, make prompt decisions to prevent delays and cost overruns and ensure that the objectives are met to protect the interests of the Government.***

- ***BRIT may take remedial steps for monitoring and strengthening its payment recovery mechanism to ensure that the realisable dues are recovered in a timely manner.***

- ***BRIT may deploy a dedicated team to ensure submission of proforma accounts from its inception so that the true and fair financial position may be depicted in the accounts.***

CHAPTER I
Introduction

1.1 About this Report

The mandate of the Comptroller and Auditor General of India regarding audit of Union and States, Government Companies and Corporations, bodies and authorities is derived from the Constitution and the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971. The Comptroller and Auditor General of India is the sole authority prescribed in the Constitution entrusted with the responsibility of the audit of Accounts of the Union and of the States. Under Section 13 (read with Section 17) and Section 16 of the Act, it is the duty of the Comptroller and Auditor General to audit all expenditure, all receipts and other transactions of the Governments of the Union, of each State and of each Union Territory. The Comptroller and Auditor General's mandate, under the Constitution of India and under Sections 14, 15, 19 and 20 of the CAG's (DPC) Act, also covers audit of Bodies, Authorities, Government Companies and Corporations. The Audit Reports of the Comptroller and Auditor General of India are placed before Parliament or the Legislature of the State or the Union Territory, as the case may be.

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 and to frame policies and directives that will lead to improved financial management of the organisations, thereby contributing to better governance.

This Report deals with the Compliance Audit of eight Scientific and Environmental Ministries/Departments. 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. Chapters II onwards present findings/observations arising out of the Compliance Audit of the Scientific and Environmental Ministries/Departments and the Research Centres, Institutes, Central Autonomous Bodies, along with Central Public Sector Enterprises (CPSEs), under their administrative control.

1.2 Audit coverage

This Audit Report contains Audit findings of 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 Biotechnology (DBT)**
    b) **Department of Science and Technology (DST)**
    c) **Department of Scientific and Industrial Research (DSIR)**
3) **Department of Space (DOS)**
4) **Ministry of Earth Sciences (MoES)**
5) **Ministry of Environmental, Forest and Climate Change (MoEF&CC)**
6) **Ministry of New and Renewable Energy (MNRE)**

1.3 Planning and conduct of audit

Compliance Audit refers to the examination of the transactions relating to expenditure, receipts, assets and liabilities of the 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.

After completion of audit of each unit, Inspection Reports containing the 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, the 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 2022-23, Compliance Audit of 166 out of 356 units, including Central Public Sector Enterprises, of Scientific and Environmental Ministries/Departments was conducted based on available resources and risk assessment of the units.

1.4 Budget and expenditure controls

The status of expenditure of the Scientific and Environmental Ministries/Departments for the year 2022-23 and the preceding year 2021-22 is given in ***Table 1*** below.

Table 1: Expenditure of Scientific and Environmental Ministries/Departments

Sl. No.	Ministry/Department	2021-22 *(₹ in crore)*	2022-23 *(₹ in crore)*
1.	Department of Atomic Energy	31610.92	34487.31
2.	Department of Space	12493.86	10158.48
3.	Department of Scientific and Industrial Research	5141.06	5853.37
4.	Department of Science and Technology	5146.31	4559.99
5.	Department of Biotechnology	2851.14	2121.42
6.	Ministry of Environment, Forest and Climate Change	2618.53	2837.75
7.	Ministry of New and Renewable Energy	6792.40	11121.14
8.	Ministry of Earth Sciences	2194.39	1586.08
	Total	**68848.61**	**72725.54**

The total expenditure of the eight Scientific and Environmental Ministries/Departments of the Government of India during 2022-23 was ₹72725.54 crore as against ₹68848.61 crore in 2021-22, *i.e.,* an increase of ₹3876.93 crore (5.63 *per cent*). Of the total expenditure of ₹72725.54 crore incurred by the Scientific and Environmental Ministries/ Departments during 2022-23, 47.42 *per cent* was incurred solely by the Department of Atomic Energy.

A summary of the Appropriation Accounts is given below, separately for the financial year 2022-23 in ***Table 2***:

Table 2: Details of grants received and expenditure incurred by Ministries/Departments during 2022-23

Sl. No.	Ministry/Department	Grant/ Appropriation (including Supplementary Grant) *(₹ in crore)*	Expenditure *(₹ in crore)*	(-) Savings/ (+) Excess *(₹ in crore)*	Percentage of Unspent Provision (%)
1.	Department of Atomic Energy	34895.31	34487.31	(-)408.00	1.17
2.	Department of Space	13700.64	10158.48	(-)3542.16	25.85
3.	Department of Scientific and Industrial Research	5950.13	5853.37	(-)96.76	1.63
4.	Department of Science and Technology	6002.21	4559.99	(-)1442.22	24.03
5.	Department of Biotechnology	2581.02	2121.42	(-)459.60	17.81
6.	Ministry of Environment, Forest and Climate Change	3285.08	2837.75	(-)447.33	13.62

Sl. No.	Ministry/Department	Grant/ Appropriation (including Supplementary Grant) *(₹ in crore)*	Expenditure *(₹ in crore)*	(-) Savings/ (+) Excess *(₹ in crore)*	Percentage of Unspent Provision (%)
7.	Ministry of New and Renewable Energy	12571.01	11121.14	(-)1449.87	11.53
8.	Ministry of Earth Sciences	2657.99	1586.08	(-)1071.91	40.33
Total		**81643.39**	**72725.54**	**(-)8917.85**	**10.92**

With reference to the total budget allotment of ₹81643.39 crore during 2022-23, the Scientific and Environmental Ministries/Departments had an overall saving of ₹8917.85 crore, which constitutes 10.92 *per cent* of the total Grant/Appropriation.

Out of the total unspent budget of ₹8917.85 crore, the unspent budget in the Ministry of Earth Sciences (40.33 *per cent*) was the highest, followed by the Department of Space (25.85 *per cent*), the Department of Science and Technology (24.03 *per cent*) and the Department of Biotechnology (17.81 *per cent*).

1.5 Audit of Central Autonomous Bodies

There are 86 Central Autonomous Bodies under the Scientific and Environmental Ministries/Departments. Out of these, 11 Central Autonomous Bodies have been audited under Sections[3] 19(2) and 20(1) and the remaining 75 Central Autonomous Bodies have been audited under Sections[4] 14 or 15 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971. The total grants released to 75 Central Autonomous Bodies (under Sections 14 or 15) during 2022-23 were ₹6363.77 crore. The details are given in ***Annexure 1***. The total grants released to 11 Central Autonomous Bodies (under Sections 19(2) and 20(1)) during 2021-22 and 2022-23 were ₹6794.23 crore and ₹8867.67 crore, respectively, as detailed in ***Table 3***.

[3] ***Section 19(2)- The duties and powers of the Comptroller and Auditor-General in relation to the audit of the accounts of corporations (not being companies) established by or under law made by Parliament shall be performed and exercised by him in accordance with the provisions of the respective legislations.***

Section 20(1)- Where the audit of the accounts of any body or authority has not been entrusted to the Comptroller and Auditor-General by or under any law made by Parliament, he shall, if requested so to do by the President or the Governor of a State or the Administrator of a Union territory having a Legislative Assembly, as the case may be, undertake the audit of the accounts of such body or authority on such terms and conditions as may be agreed upon between him and the concerned Government and shall have, for the purposes of such audit, right of access to the books and accounts of that body or authority, provided that no such request shall be made except after consultation with the Comptroller and Auditor General.

[4] ***Section 14- Audit of receipts and expenditure of bodies or authorities substantially financed from Union or State Revenues.***

Section 15- Functions of Comptroller and Auditor-General in the Case of Grants or Loans given to other Authorities or Bodies.

Table 3: Grants released to Central Autonomous Bodies under Sections 19(2) and 20(1) during the Financial Years 2021-22 and 2022-23

Sl. No.	Name of the Central Autonomous Body	Ministry/ Department	Amount of Grant released during FY 2021-22 *(₹ in crore)*	Amount of Grant released during FY 2022-23 *(₹ in crore)*
i.	Council of Scientific and Industrial Research, New Delhi	DSIR	5049.17	5829.42
ii.	Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram	DST	335.01	335.00
iii.	Technology Development Board, New Delhi	DST	125.00	100.00
iv.	Science and Engineering Research Board, New Delhi (now Anusandhan National Research Foundation)	DST	900.00	2176.00
v.	National Tiger Conservation Authority, New Delhi	MoEF&CC	9.86	52.85
vi.	Wildlife Institute of India, Dehradun	MoEF&CC	25.51	30.60
vii.	Central Zoo Authority, New Delhi	MoEF&CC	11.25	10.83
viii.	National Biodiversity Authority, Chennai	MoEF&CC	16.13	17.92
ix.	Regional Centre for Biotechnology, Faridabad	DBT	41.15	52.45
x.	Compensatory Afforestation Fund Management and Planning Authority, New Delhi	MoEF&CC	261.65	250.00
xi.	Commission for Air Quality Management, New Delhi	MoEF&CC	19.50	12.60
Total			**6794.23**	**8867.67**

1.5.1 Significant audit comments on the accounts of the Central Autonomous Bodies for the year 2022-23

Some of the significant audit comments arising from the Financial Audit of the Central Autonomous Bodies are given below in ***Table 4.***

Table 4: Significant audit comments on the accounts of Central Autonomous Bodies

Sl. No.	Name of the Autonomous Body	Comments
Ministry of Environment, Forest and Climate Change		
1	National Compensatory Afforestation Management and Planning Authority	Under Schedule 7- Current Liabilities, an amount of ₹6030.16 lakh has been shown under the head 'Statutory Liabilities-Others. However, this includes interest of ₹3139.42 lakh earned for the period 2018-19 to 2021-22. This had resulted in overstatement of Current Liabilities and understatement of Prior Period Income, both by ₹3139.42 lakh.
Department of Biotechnology		
2.	Regional Centre for Biotechnology, Faridabad	• A balance of ₹5575 lakh reported as 'Project Grant/Fellowships' was a net figure consisting of credit balance of ₹5648.33 lakh and debit balance of ₹73.33 lakh under 80 sponsored projects, which were set off against each other while representing the amount in the Balance Sheet.

Sl. No.	Name of the Autonomous Body	Comments
		As the debit balances were nothing, but the excess expenditure incurred against the amount available with RCB, which was to be received from the project sponsoring agencies, netting of excess expenditure by RCB led it to understate its Current Liabilities (Project Grant/Fellowship) as well as Current Assets (Excess expenditure incurred on projects-Receivable), each by ₹73.33 lakh. • It was reported in the previous year's Audit Report that although works amounting to ₹12146.73 lakh had been completed long ago in 2015 and 2021 and were also put to use, yet the same were shown under Capital Work in Progress (CWIP). RCB assured (August 2022) that the same will be capitalised during the year 2022-23. However, RCB capitalised an amount of ₹450.98 lakh only during 2022-23. Thus, works amounting to ₹11695.75 lakh[5] were yet to be capitalised. As a result, RCB could not charge depreciation amounting to ₹5017.61 lakh[6] on such buildings. Hence, RCB understated its Expenditure (Depreciation) and overstated the Fixed Assets each by ₹5017.61 lakh.
Department of Scientific and Industrial Research		
3.	Council of Scientific and Industrial Research, New Delhi	Two laboratories[7] made advance payments totalling ₹520.02 lakh out of externally funded projects. The same was booked as the Final Payment instead of showing the same as Advances in Current Assets. As a result, Current Liabilities (Deposits for Externally Funded Projects) as well as Current Assets (Advances) each were understated by ₹520.02 lakh.
Department of Science and Technology		
4.	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram	As per Rule 233(ii) of GFR 2017, on completion of the projects or schemes, if the assets are allowed to be retained by the sponsoring institute/ organisation, the implementing agency should include the assets at book value in their own accounts. As per Paragraph 12 of Schedule 25 for the year ended March 2023, the value of assets acquired from ongoing external projects for the last three years was reported. The value of assets from[8] April 2014 to March 2023 was ₹55.24 crore. At the instance of Audit, SCTIMST decided (July 2023) to include assets worth ₹38.07 crore pertaining to the six-year period from 2014-20 to its Fixed Assets. However, the revision in accounts is pending.
5.	Technology Development Board, New Delhi	As per the sanction orders for the release of grants by the DST, remittance/ refund of all interest and other earnings against the released grant to the Consolidated Fund of India (through NTR Portal) is required after finalisation of the accounts with a certificate and SoE/UC for considering any subsequent release of the grant. During the review of the records, it was observed that after

[5] ***Amount to be capitalised (₹12146.73 lakh)-Amount capitalised (₹4510.98 lakh).***

[6] ***Depreciation till 2021-22 (₹4250.54 lakh) + Depreciation for 2022-23 (₹789.62 lakh)-Depreciation actually charged during 2023-23 (₹22.55 lakh).***

[7] ***Central Scientific Instruments Organisation-₹24.39 lakh and National Physical Laboratory-₹495.63 lakh.***

[8] ***Year 2014-16-₹132.07 lakh, Year 2016-17-₹718.52 lakh, Year 2017-18-₹850.68 lakh, Year 2018-19-₹940.31 lakh, Year 2019-20-₹1165.23 lakh, Year 2020-21- ₹518.19 lakh, Year 2021-22-₹1043.04 lakh, Year 2022-23-₹156.03 lakh.***

Sl. No.	Name of the Autonomous Body	Comments
		getting grants-in-aid of ₹100.00 crore during 2022-23, TDB kept the unspent amount of ₹85.65 crore in its Capital/Corpus Fund after transferring the same from the Treasury Single Account in violation of GFRs and GoI guidelines for release of grants through TSA 'Just-in-time' Model from Consolidated Fund of India (CFI). Thus, this has resulted in overstatement of Capital/Corpus Fund, besides understatement of current liabilities, both by ₹85.65 crore.

1.5.2 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, 2017 mention that every Central Autonomous Body should complete its Accounts within three months after the close of the Accounting Year and make them 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 11 Central Autonomous Bodies, five of the Central Autonomous Bodies submitted their Accounts for the year 2022-23. Four of these were sent to Audit with nominal delays ranging between 5 to 14 days[9], while the Accounts of the Wildlife Institute of India, Dehradun, were received with a significant delay of 87 days.

1.5.3 Delay in the presentation of the annual report of Central Autonomous Bodies before both Houses of Parliament

The Committee on Papers Laid on the Table of the House in its First Report (1975-76) had recommended that the Audited Accounts of the Central Autonomous Bodies should be laid before Parliament within nine months of the closing of the accounting year, *i.e.,* by 31st December of the following financial year. Further, as per Rule 237 of the General Financial Rules, 2017, the Central Autonomous Bodies have to submit Annual Reports and Audited Accounts to the nodal Ministry to be laid in the Parliament by 31st December.

The details of the delay in the presentation of annual report for the Financial Year 2022-23 by Central Autonomous Bodies to Parliament are mentioned in ***Table 5*** below.

[9] ***National Tiger Conservation Authority, New Delhi, Commission for Air Quality Management, New Delhi, Council of Scientific and Industrial Research, New Delhi, Sree Chitra Tirunal Institute of Medical Sciences and Technology, Thiruvananthapuram***

Table 5: Delay in the presentation of the annual report for FY 2022-23 to Parliament by Central Autonomous Bodies

SI. No.	Name of Autonomous Body	Date of Presentation of Annual Report in Parliament		Delay	
		Lok Sabha	Rajya Sabha	Lok Sabha	Rajya Sabha
1.	National Biodiversity Authority, Chennai (MoEF&CC)	24.6.2024	1.7.2024	5 months and 24 days	6 months and 1 day
2.	Wildlife Institute of India, Dehradun (MoEF&CC)	Not presented yet			
3.	Central Zoo Authority, New Delhi (MoEF&CC)	5.2.2024	21.12.2023	1 month and 5 days	No delay
4.	Council of Scientific and Industrial Research, New Delhi (DSIR)	28.6.2024	28.6.2024	5 Months and 28 days	5 Months and 28 days
5.	Compensatory Afforestation Fund Management and Planning Authority (CAMPA), New Delhi, (MoEF&CC)	27.11.2024	28.11.2024	10 months and 27 days	10 months and 28 days
6.	Commission for Air Quality Management (MoEF&CC)	5.2.2024	21.12.2023	1 month and 5 days	No delay

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 the information furnished by the eight Ministries/Departments, 41,526 Utilisation Certificates due (as of 31 March 2023) for grants released aggregating ₹16905.17 crore were outstanding from these eight Ministries/Departments as given in ***Table 6***.

Table 6: Outstanding Utilisation Certificates (UCs)

Ministry/Department		Number of outstanding UCs	Share of total outstanding UCs (*per cent*)	Amount pertaining to outstanding UCs *(₹ in crore)*	Share of amount pertaining to total outstanding UCs (*per cent)*
1)	Department of Biotechnology	20054	48.29	9270.00	54.84
2)	Department of Atomic Energy	724	1.74	124.97	0.74
3)	Department of Scientific and Industrial Research	4	0.01	19.03	0.11
4)	Department of Space	469	1.13	25.97	0.15
5)	Ministry of Earth Sciences	757	1.82	84.12	0.50
6)	Ministry of Environment, Forest and Climate Change	4764	11.47	1024.89	6.06
7)	Ministry of New and Renewable Energy	1025	2.47	2193.58	12.98
8)	Department of Science and Technology	13729	33.07	4162.61	24.62
	Total	**41526**	**100**	**16905.17**	**100**

It can be seen from the table that the highest number of outstanding UCs pertains to DBT (48.29 *per cent*), followed by DST (33.07 *per cent*) and MoEF&CC (11.47 *per cent*). Ministry/ Department-wise and period-wise position of outstanding utilisation certificates is given in ***Annexure 2***.

1.7 Audit of Central Public Sector Enterprises

Section 143(6) of the Companies Act, 2013, grants the Comptroller and Auditor-General of India the right to conduct a supplementary audit of a company's financial statements within 60 days of receiving the Audit Report of the auditor appointed by it under Section 139 (5) and (7) of the Companies Act 2013 and to comment on or supplement the Audit Report.

This office oversees 24 Central Public Sector Enterprises (CPSEs) within its audit jurisdiction. It had received financial statements from 23 of these enterprises for the year 2022-23. According to the Ministry of Corporate Affairs 21 database, Andaman Islands Forest and Plantation Development Corporation Limited, Port Blair, has been struck off, though confirmation from the concerned Ministry is still pending.

Of the 23 CPSEs, an Audit Comment was issued for one Central Public Sector Enterprise, while non-review certificates were issued for five. Nil comments were issued on financial statements of 17 CPSEs out of which Management letters were issued to 15 CPSEs. The details have been given in ***Annexure 3.***

Audit Comments issued in respect of accounts of one company, *i.e.,* Nuclear Power Corporation of India Limited, for the year 2022-23 are mentioned below.

> *As per Accounting Policy No. 16- Revenue Recognition and Other Income states that 'Delayed Payment Charges/Surcharge on late or non-payment of dues by customers for sale of energy are accounted only when the recoverability is confirmed, which coincides with receipts'.*
>
> *Other Income includes an amount of ₹1,171.49 crore from Delayed Payment charges (DPC). Of this, an amount of ₹1,110.01 crore pertains to DPC in respect of electricity beneficiaries who have opted to liquidate the arrears in EMI as per Electricity (Late Payment Surcharge and Related Matters) Rules, 2022. Out of which a sum of ₹813.34 crore was received during the year, leaving a sum of ₹296.67 crore as receivable as on 31 March 2023. But the entire amount of ₹1,110.01 crore has been accounted for income, which is in contravention of Accounting Policy No. 16- Revenue Recognition and Other Income.*
>
> *This has resulted in an overstatement of Other Income and Profit both by ₹296.67 crore.*

1.8 Losses and Irrecoverable Dues Written off/Waived during 2022-23

Statement of losses and irrecoverable dues written off/waived during 2022-23, furnished by the Scientific and Environmental Ministries/Departments, is given in ***Annexure 4***. A total amount of ₹3.46 lakh was written off in 15 cases under the category 'Other Reasons' in Department of Atomic Energy and Department of Space.

1.9 Response of Ministries/Departments to previous Inspection Reports

As per the Manual of Standing Orders (Audit) (Second Edition), Heads of Offices and next higher authorities are required to respond to the observations contained in Inspection Reports and take appropriate corrective action. Audit observations communicated in Inspection Reports are also discussed at periodical intervals in meetings by officers of the Office of the Director General of Audit, Central Expenditure (Environment and Scientific Departments) with officers of the Scientific and Environmental Ministries/Departments.

As of 31 March 2023, 1,507 Inspection Reports containing 9,050 paras pertaining to previous years were pending for settlement and out of these, first replies had not been received in respect of 13 Inspection Reports having 228 paras as detailed below.

Table 7: Details of Inspection Reports having paras pending for settlement

Year	Number of IRs/Paras pending settlement as of 31 March 2023		IRs/Paras where even the first replies have not been received as of 31 March 2023	
	IRs	Paras	IRs	Paras
Up to 2017-18	924	3,860	0	0
2018-19	103	624	0	0
2019-20	81	665	0	0
2020-21	108	927	0	0
2021-22	159	1,516	3	57
2022-23	132	1,458	10	171
Total	**1,507**	**9,050**	**13**	**228**

Further, Department-wise break up of outstanding Inspection Reports and Paras are given in ***Annexure 5***.

1.10 Response of the Ministries/Departments to Draft Audit Paras

On the recommendations of the Public Accounts Committee, Ministry of Finance (Department of Expenditure) issued directions to all Ministries in June 1960 to send their response to the Draft Audit Paras proposed for inclusion in the report of the CAG. The provision related to government response to Audit observations has also been prescribed under Para 142 of Regulations on Audit and Accounts, 2020, made by the CAG.

The Draft Paras 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 Paras proposed for inclusion in this Report were forwarded to the Secretaries concerned between May 2024 and February 2025 through demi-official letters addressed to them.

This Report contains nine paras, three Subject Specific Compliance Audits and one IT Audit. Out of 13 Paras, Ministries/Departments have submitted responses for five paras only. The responses received from concerned Ministries/Departments have been suitably incorporated in the report.

1.11 Follow-up on Audit Reports

(a) For Civil Units

In its Ninth Report (Eleventh Lok Sabha) presented to the Parliament on 22 April 1997, the Public Accounts Committee recommended that Action Taken Notes (ATNs) on all paras 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 the date of laying of the Reports in the Parliament.

A review of outstanding ATNs as of 31 December 2024 on the paras included in the Reports of the CAG pertaining to the Scientific and Environmental Ministries/Departments (***Annexure 6***) revealed that four ATNs pending from four Ministries/Departments (DBT, DOS, DSIR and DAE) were not received for the first time even after delays ranging from 6 months and 22 days to 47 months and 8 days from the date of laying of Reports in the Parliament. Also, revised ATNs that have to be uploaded by the Ministry within 20 days of getting Audit comments/clarification were pending in three cases from two Ministries/Departments (MoEF&CC and DSIR) with delays ranging from 6 months and 28 days to 13 months and 14 days as of 31 December 2024 (***Annexure 7***).

(b) For Commercial Units

The Lok Sabha Secretariat requested (July 1985) all the Ministries to furnish notes (duly vetted by Audit) indicating remedial/corrective action taken by them on various paras/ appraisals contained in the Audit Reports (Commercial) of the CAG as laid on the table of both the houses of Parliament. Such notes were required to be submitted even in respect of paras/appraisals that were not selected by the Committee on Public Sector Undertakings for detailed examination. The Committee on Public Sector Undertakings, in its Second Report

(1998-99-Twelfth Lok Sabha), while reiterating the above instructions, recommended that each Ministry/Department should furnish a brief note on the review of the follow-up Action Taken on each of the Comptroller and Auditor General's Reports presented to Parliament. The note needs to be vetted by Audit before submission to the Committee.

A review of outstanding ATNs as of 31 December 2024 on paras included in the CAG reports pertaining to CPSUs under these Ministries/Departments (***Annexure 6***) revealed that one ATN from the Department of Atomic Energy had not been received for the first time, even after a delay of 6 months and 22 days.

CHAPTER II
Department of Biotechnology

2.1 Subject Specific Compliance Audit of National Biopharma Mission

2.1.1 Introduction

The National Biopharma Mission (NBM) is an industry-academia collaborative mission of the Department of Biotechnology, Ministry of Science and Technology, to accelerate bio-pharmaceutical development in the country. The Cabinet Committee on Economic Affairs approved the Mission in May 2017 at a total cost of ₹1500 crore, initially for five years, extended till 30 June 2025. The Mission was funded by the Government of India, 50 *per cent* of which was to be met through a World Bank loan. The Mission was implemented by the Biotechnology Industry Research Assistance Council (BIRAC), a Public Sector Undertaking of the Department of Biotechnology. Out of the total allocation of ₹1500 crore, BIRAC received ₹952 crore during the period 2017-2024.

The Mission was formally titled 'Industry-Academia Collaborative Mission for Accelerating Discovery Research to Early Development for Biopharmaceuticals- Innovate in India, Empowering biotech entrepreneurs and accelerating inclusive innovation'. The Mission was to focus on-

i. Development of products from leads that were at advanced stages in the product development lifecycle and relevant to public health.

ii. Strengthening and establishing shared infrastructure facilities for both product discovery validation and manufacturing.

iii. Developing human capital by providing specific training to address the critical skills gaps in researchers and nascent biotech companies across the product development value chain, including business plan development and market penetration.

iv. Creating and enhancing technology transfer and intellectual property management capacities and capabilities in the public and private sectors.

Under the Mission, financial and technical support is provided to start-ups, academic institutions and industry partners. The Mission has eight verticals under which grants were extended. The financial performance of the Mission, as of August 2024, across the verticals, is depicted in ***Figure 1*** below.

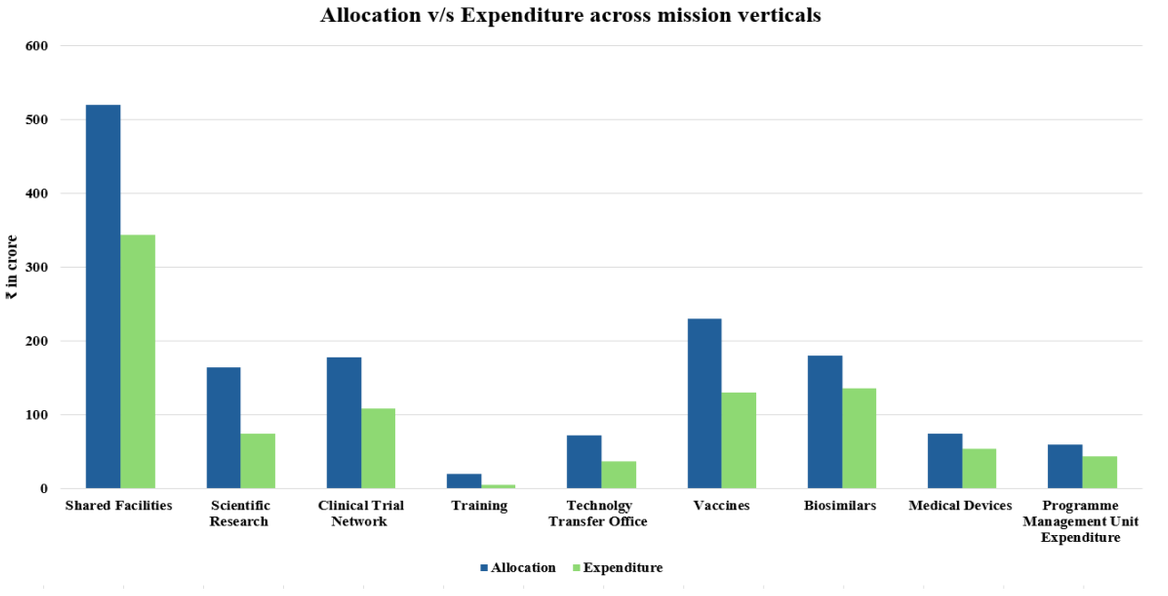

Figure 1: Allocation v/s Expenditure across Mission verticals and towards Programme Management Unit

As can be seen above, expenditure has consistently remained lower than the allocation made in the Expenditure and Finance Committee Note across all eight verticals. The Shared Facilities vertical had the maximum difference between the allocation and corresponding expenditure.

2.1.1.1 Audit Scope and Sampling

Audit covered the activities under NBM from 2018-19 to 2023-24. Till May 2023, a total of 139 projects had been selected by BIRAC to be funded under the Mission for which a total of ₹936.61 crore was released. Audit sample consisted of 52 projects which was 37 *per cent* of the total number of projects. Allocation under the sampled projects amounted to ₹747.32 crore, which was 50 *per cent* of ₹1500 crore, the total allocation for the Mission. Sampling was done by stratifying the project population according to the project component being addressed by the project.

2.1.2 Institutional Mechanism for implementation and monitoring

The Institutional Mechanism for implementation and Monitoring of the projects undertaken in the Mission is given in ***Figure 2*** below.

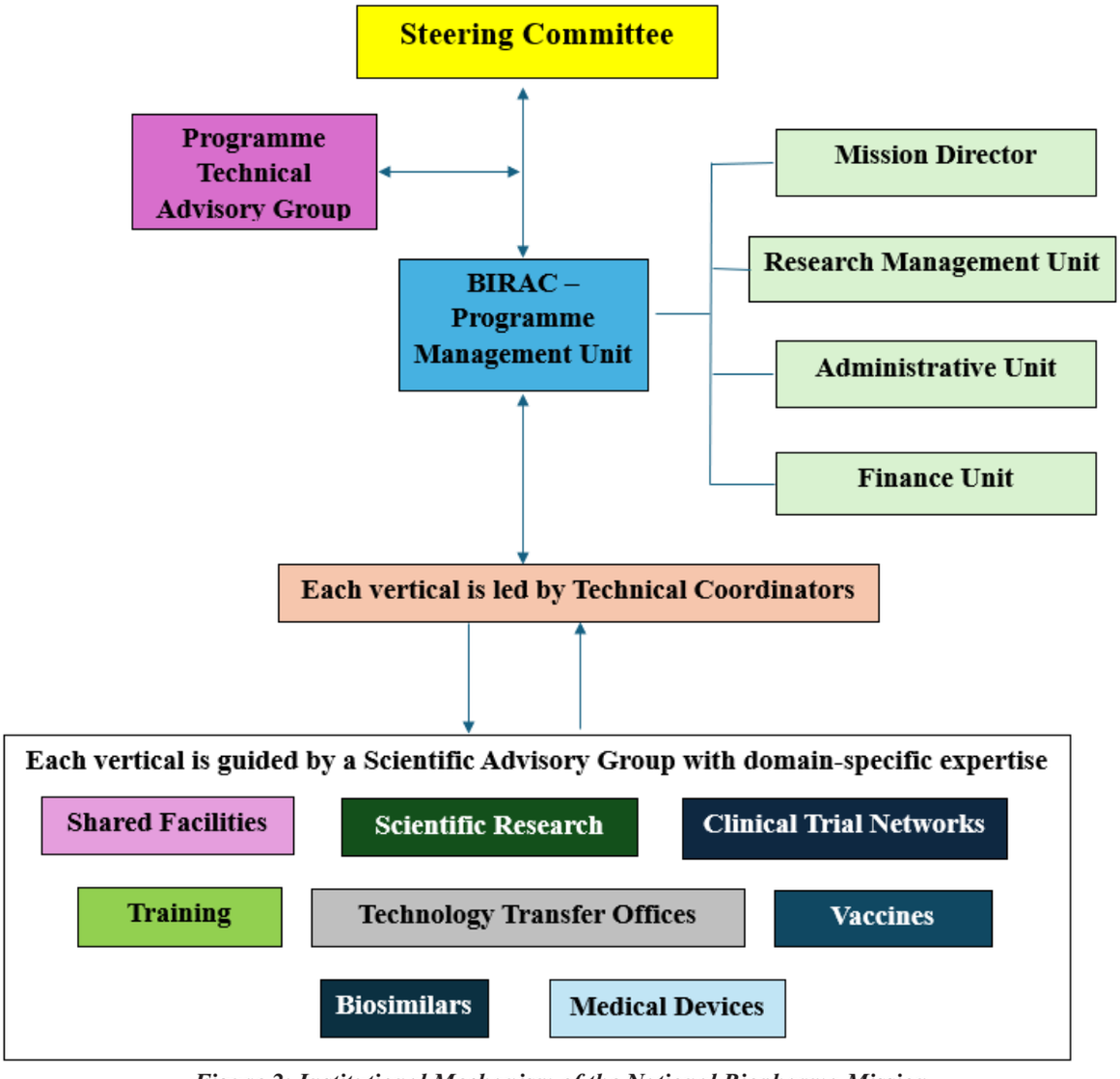

Figure 2: Institutional Mechanism of the National Biopharma Mission

2.1.3 Audit Findings

2.1.3.1 Mission manpower

The Programme Management Unit (PMU) was to work as an operational and functional arm for the Mission to oversee and monitor the implementation and progress of the programme. The PMU was to be headed by a dedicated Director and was responsible for overall project management, procurement, financial management, safeguards, monitoring and reporting. Audit observations related to the PMU as part of the institutional mechanism of the Mission are as follows.

i. Capacity limitation in the Programme Management Unit

The sanctioned strength of manpower and actual strength at the PMU during the period 2018-2023 were as follows.

Table 8: Sanctioned Strength and the positions operated in the Programme Management Unit

Sl. No.	Position Sanctioned	Sanctioned Strength	Position operated
1.	**Mission Director**	01	01
2.	**Each of the Technical Units (Approx. 10 units)**		
	Technical Head- 1/unit	10	00
	Analysts- 2/unit	20	07
	Consultants- 1/unit	10	00
3.	**Financial Unit**		
	Finance Head	01	00
	Staff	02	02
	Quality Control	02	00
4.	**Administrative Unit**		
	Admin. Head	01	0
	Administrative Staff	02	02
	Legal and Compliance	02	00
Total		**51**	**12**

Audit observed that NBM operated only 12 positions in the PMU against the sanctioned 51 positions as detailed above. No technical Heads were hired, leaving each vertical without dedicated leadership. Further, positions of Financial Head and Administrative Head were also vacant. As a result, the responsibility of technical monitoring fell on the Mission personnel and the financial due diligence was assigned entirely to the Chartered Accountants empanelled with BIRAC. Audit further observed that the advertisements were called for different numbers of positions in a piecemeal manner. This resulted in most of the sanctioned positions remaining vacant; 39 of them remained vacant throughout the Mission duration. The position of Mission Director cumulatively remained vacant for almost two years before the appointment of the current Mission Director (1 June 2023). BIRAC did not share the reasons for keeping the post of Mission Director vacant for such a long period.

BIRAC stated (May 2024) that the Mission was being implemented in project mode and positions are coterminous with the project and that the Mission has provided good visibility and scope for other opportunities. They further stated that the recruitment for the Mission was also impacted by the COVID pandemic. Audit, however, observed that the shortages in manpower have continued in the post-COVID period also.

BIRAC further stated (February 2025) that even in the absence of the Mission Director, the Mission was adequately supported and more than 50 projects' appraisals, implementation and monitoring meetings were conducted. However, BIRAC has also assured that the involvement of PMU Finance Officers during site visits is now being ensured.

The reply may be viewed in light of the fact that, due to the limited human resources, BIRAC was unable to monitor the overall progress of the Mission or even handhold the project proponents properly. Given the scale and scope of the Mission, the manpower required for PMU was projected and approved. It is inevitable that limitations on human resources available impacted the implementation of the Mission as discussed subsequently in the *Paras 2.1.4* and *2.1.5*.

ii. Appointments in the Programme Management Unit and Project Monitoring Committees

According to Para 2.1.2 of Expenditure and Finance Committee Note for the Mission, the selection of staff for the PMU was to be carried out through a competitive process, depending on the eligibility and selection criteria as identified by the TAG/Steering Committee. Also, as per the Standard Operating Procedure of the Mission, a Project Monitoring Committee (PMC) was to be formed within three to four months of the sanction of each project.

It was observed that in all the 52 sampled cases examined by Audit, the nomination method was used to select members of the PMU instead of a formal competitive process. BIRAC nominated the Legal Advisor already engaged with them as the Legal Advisor for NBM too, without calling for applications for the post through open advertising, by paying them an additional remuneration of ₹60,000 per month, which was irregular. Further, BIRAC nominated the Environmental Engineer without calling for applications through open advertising. The remuneration was fixed on per visit basis without providing a detailed breakup for the payment.

Similarly, in the case of PMC, the Committee members were appointed by sending email invites without any fixed criteria or justification for their selection.

In respect of PMU, BIRAC (February 2025) stated that the Legal Advisor was nominated due to urgency in the initial phase of the Mission. For the Environment Engineer, BIRAC stated that there was limited availability of expertise, therefore, the personnel were engaged by nomination. In respect of PMC, BIRAC (February 2025) added that the members were proposed by the technical team from BIRAC's pool of experts' database and now the process of appointing committee members has been revised based on inputs by Audit. However, Audit did not come across such database during the field visit, nor was the reply supported by any documentary evidence.

The fact remains that the process followed did not ensure that the Mission had access to a diverse pool of qualified candidates as outlined in the Expenditure and Finance Committee Note.

2.1.3.2 Consultancies

As per the Draft Programme Implementation Manual of the Mission, the PMU was to be supported by a Technical Knowledge Partner and a Clinical Trial Consultant. BIRAC appointed three consultants by calling for three different Requests for Expression of Interest.

I. A Consultancy Technical Knowledge Partner.

II. A Clinical Trial Regulatory Advisory and Data Safety Consultant and

III. A Consultant for enabling and training personnel at Technology Transfer Offices.

The following discrepancies were noticed in the appointment of consultants.

a) There were no provisions for the appointment of a consultant for enabling and training personnel at the Technology Transfer Office in the Cabinet Note or Expenditure and Finance Committee Note or the draft Programme Implementation Manual of the Mission, but a consultant for the same was appointed under the Mission for a total budget of ₹5 crore.

BIRAC, while not furnishing the reasons for irregular appointment of consultant for enabling and training personnel at the Technology Transfer Office, stated (February 2025) that consultants were engaged as per the General Procurement Notice of the World Bank, according to which the cost per consultancy for the period should not exceed USD 800000.

However, the fact remains that a consultant for enabling and training of personnel at the Technology Transfer Office was never planned in the Mission.

b) Further, as per the EFC and Cabinet Notes, the Mission funding was required to be transparent and competitive and as per the Manual for Procurement of Consultancy, contracts more than ₹0.25 crore were required to be awarded competitively. Against this, Audit observed that the advertisements for procuring two consultancy services, mentioned at I and II above, were published in only one national daily each, the details of which were not provided. Also, these advertisements were not published through the Government e-Marketplace, official website or Central Public Procurement Portal, despite being more than ₹0.25 crore.

BIRAC (February 2025) stated that the advertisements for Clinical Trial Regulatory Advisory and Data Safety Consultant were published in national dailies (English and Hindi), science magazines, *etc.,* and advertisements for Consultancy Technical Knowledge Partner were advertised in leading national dailies. However, the details of the same were not provided. The reply was also silent about e-publishing on the Central Public Procurement Portal.

c) The Manual for Procurement for Consultancy and Other Services also requires that the terms of reference should include all details related to procurement, *i.e.,* facilities which would be provided to the consultant by the procuring entity, institutional and organisational arrangements and other details. However, the terms of reference for awarding the above three consultancies did not contain any such details. Audit also found that in the case of one of the three consultants (International AIDS Vaccine Initiative), NBM has been paying monthly rental of ₹81,297 for office premises located at Gurgaon (Haryana) despite not having any clause for such payment in the agreement entered with International AIDS Vaccine Initiative. Till September 2023, a total of ₹0.58 crore had been paid to International AIDS Vaccine Initiative for this purpose. These non-uniformities indicated that the contracts devised for consultancies were poorly structured and lacked the necessary transparency and consistency, leading to potential discrepancies in the management of consultancy services.

BIRAC stated (February 2025) that total budgets were the same for all three consultancies and details of the budget were different because of their nature of work.

However, the fact remains that the three agreements entered lacked the necessary details based on which payments were to be made as required under clause 4.1.2 of the Manual for Procurement for Consultancy and Other Services.

2.1.3.3 Lack of Continued Engagement of Trained Certified Manpower

Extensive training leading to recognised certifications were provided to the manpower with the Mission funds in many of the verticals, especially under Technology Transfer Offices (TTO) and Clinical Trial Networks (CTN). However, both these verticals reported high attrition of manpower. In all 10 field visits made by the Audit team to TTO and CTN grantees, high manpower attrition was reported. It was seen that NBM did not set any contractual obligations in the form of bonds, guarantees or obligations for the manpower trained with the Mission funds to ensure that they are engaged for the entire Mission period. Although the Request For Proposal for the CTN (TTO had no Request For Proposal since they were nominated) required the manpower positions to be operated for durations that were coterminous with the Mission to ensure continuity, the contracts for manpower engagement at all of the audited

TTO and CTN were not found to be coterminous with the Mission. This, in turn, prompted most of the staff to quit by the end of such contracts. Attrition was a major issue at the Shared Facilities too, the Request for Proposal of which did not talk about the tenure of the recruited manpower at all. The only exceptions were IKP Hyderabad[10] and Centre for Cellular and Molecular Platforms, Bangalore, which had recruited manpower on its own rolls and not on the rolls of the Mission.

Retention of the manpower could have been assured by either ensuring Mission coterminous positions by incentivising the tenure completion in the Mission or disincentivising quitting the Mission prematurely, but none of these were explored.

While providing instances where the budget enhancements for retaining core project staff were allowed by them and where budget re-appropriations were made to allow salary hikes in the projects, BIRAC has stated (February 2025) that Audit remarks have been duly noted for incorporation of relevant clauses in the Grants-in-Aid Letters for future compliance.

Recommendation 1:

The capacity requirements for the PMU may be firmed up and strict contractual terms like signing of bonds, guarantees or obligations may be deployed to ensure that the personnel involved are retained till the end of the Mission, thus ensuring the successful achievement of Mission objectives.

2.1.4 Mission Implementation

There were 139 projects under the Mission during 2017-2024, which commenced during the audit period. Out of these, 55 projects were completed/foreclosed/terminated and 84 projects were ongoing as of February 2025.

2.1.4.1 Non-finalisation of Programme Implementation Manual

As per the Expenditure and Finance Committee Note of the Mission as well as the Project Appraisal Document of the World Bank, BIRAC was to implement the Project in accordance with a Programme Implementation Manual. The Manual was required to be drafted as well as approved at the very beginning of the Mission.

Audit observed that though a draft Programme Implementation Manual was prepared in November 2017, it was never approved and therefore never finalised. The non-finalisation of this Manual deprived the PMU of a single point of authority and accountability framework on which the Mission implementation could be based.

[10] ***Incorporated in 1998 as ICICI Knowledge Park, known as IKP after ICICI divested equity to IKP Trust in September 2006.***

BIRAC stated (February 2025) that the operational document was placed before the Steering Committee and it was duly agreed.

The reply needs to be viewed against the backdrop of the fact that BIRAC could not provide any supporting documents for this reply, nor was the documentary evidence regarding when it became operational furnished with this reply.

2.1.4.2 Financial Progress of the Mission

Out of the total allocated budget of ₹1500 crore for five years, ₹952 crore had been released by the Department of Biotechnology to BIRAC from 2017-18 till March 2024. The releases made by the Department of Biotechnology were way less than that estimated in the Expenditure and Finance Committee Note of the Mission. The difference was due to the extremely slow disbursement rate under the project.

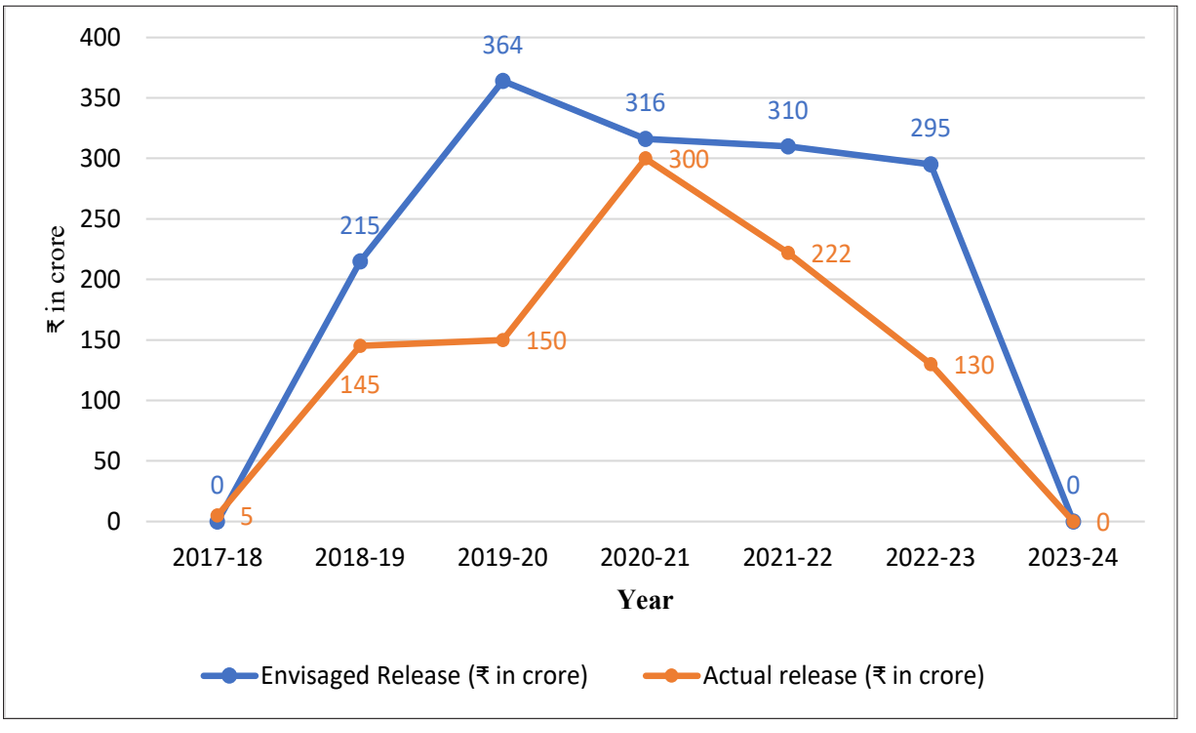

Figure 3: Sanctioned v/s Actual Financial Progress[11]

BIRAC stated (May 2024) that during the pandemic, many grantees started working in the area of COVID-19 and progress towards other projects was impacted. Audit, however, noted on the contrary that the financial progress of the project was at its peak during this period. BIRAC further explained (February 2025) that the peak was observed as the COVID projects were

[11] ***There was fund withdrawal of ₹90 crore by the Department of Biotechnology during 2023-24, thus, the effective release was nil.***

newly sanctioned (first releases). The impact of the COVID-19 pandemic, however, affected the progress of non-COVID projects significantly.

2.1.4.3 Selection by nomination instead of open competition

Under the implementation modality of the Mission, the grantees were to be selected through a competitive system based on defined selection criteria and for the selection of investigators/ institutions, there were to be specific calls for proposals. The requirement of open competition was also stipulated in the equity, innovation and public accountability statement (Appendix II) of the Cabinet Note of the Mission.

Audit observed that out of ₹1500 crore allocated for the Mission so far, allocations totalling ₹163.26 crore[12] (10.88 *per cent*) were decided on nomination basis instead of transparent competition. Despite using the shortcut of nomination, BIRAC has been able to utilise only ₹42.81 crore[13] (26.22 *per cent)* as of August 2024 out of the amount allocated on nomination basis. Audit further observed that global competition was not ensured while awarding the project of setting up Technology Transfer Offices and the proposals were invited by sending specific email invites to six lead incubator partner sites of the existing 41 BioNEST incubators supported under BIRAC. Similarly, Under the Training vertical, six contracts amounting to ₹6.62 crore were awarded to three companies by directly awarding work orders on the basis of the experience of the companies, previous work in the same area done by the companies, the urgency of the work, already awarded works of a similar nature, *etc.,* as detailed in ***Annexure 8.***

With respect to Technology Transfer Offices, BIRAC accepted (February 2025) that it had created six clusters of Bioincubators. Based on the background work done by BIRAC over seven years of establishing these Bioincubators in the country, applications from these six bioclusters were invited to establish Technology Transfer Offices, with the concurrence of the World Bank.

For the Training Vertical, BIRAC informed (February 2025) that, taking note of the Audit observations, they have launched two Requests for Proposals for two comprehensive training programmes in December 2024 in leading dailies.

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[12] ***This included ₹72 crore allocated in the Technology Transfer Offices vertical, ₹20 crore in Training vertical and ₹71 crore allocated to an entire Request for Proposals call termed as 'follow-on' funding restricted to erstwhile BIRAC grantees.***

[13] ***₹37.20 crore utilised under the Technology Transfer Offices vertical, ₹5.61 crore utilised under the Training vertical and Nil under the allocations made under 'follow-on' Request for Proposals.***

Recommendation 2:

It should be ensured that the selection of the implementation agencies is done through competitive processes as stipulated in the Cabinet Note of the Mission.

2.1.4.4 Project implementation

i. Release of milestone grants in contravention of Grants-in-Aid Letter Agreement

Under the Mission, the releases for the project were to be made by allocating 30 *per cent* of the total allocation upon acceptance of undertaking under Grants-in-Aid Letter Agreement and fulfilment of fund release requirements; 20 *per cent* each upon completion of first, second and third milestones and the remaining 10 *per cent* upon submission of completion report and consolidated Utilisation Certificate and Statement of Expenditure. However, in the following cases, Audit observed that the releases of ₹5.46 crore were contrary to the Grants-in-Aid Letter Agreement conditions.

Table 9: Violation of Grants-in-Aid Letter Agreement

Project title	Grants-in-Aid Letter Agreement contravention	BIRAC's reply
Production of Safe and Effective Oral Cholera Vaccine of Global Manufacturing Practices Standards in India through Industry-Academia Partnership	The second milestone was the production of three consistent batches of 10-litre scale and the initiation of stability studies. Although the second milestone remained unachieved, the second instalment of ₹1.37 crore was disbursed.	While accepting the observation, BIRAC stated (February 2025) that the Scientific Advisory Group (SAG) committee acknowledged that milestones were not achieved even after the grantee utilised the second instalment and therefore, the project was foreclosed.
Development of an IT Platform	SAG, in November 2021, accepted the grantee's request for early release of the second milestone fund of ₹1.18 crore without the second technical milestone being achieved. Again, in July 2022, the SAG recommended the release of the third milestone funds of ₹1.20 crore in October 2022 to the grantee, although the required milestone was not achieved by then. In the same project, the SAG recommended the release of the fourth instalment of ₹1.21 crore without the conditions of the Grants-in-Aid Letter Agreement being met.	BIRAC replied (February 2025) that the review of milestones, activities preceding the milestones and recommending the release is under the purview of PMC or SAG. However, the fact remains that PMC and SAG were integral parts of the Mission itself and their recommendations to release further instalments were made without the achievement of technical milestones.
BioBetter Therapeutic for a Genetic Disorder	The milestone for the release of the second instalment was 'Status report on Screening of peptide library, sequencing and alignment of at least 6-10 hits of peptides'. In the SAG meeting of May 2021, it was observed that 'The team is yet to initiate the experimental work. All the data presented is based on in-silico analysis.' However, the second instalment of ₹0.50 crore was released without the achievement of this milestone.	BIRAC confirmed the facts in its reply (February 2025).

The release of milestone grants in contravention of the Grants-in-Aid Letter Agreement without the milestones being met undermines the sanctity of the Agreements.

ii. Irregularities in project implementation

Audit noted several instances of irregularities in project implementation. Some significant cases have been illustrated in the coming paragraphs.

a. Treatment of Non-Recurring Expenditure as Recurring

Cabinet Note for the Mission specified that the maintenance and upkeep of capital assets were to be as per the Government of India policy. Capital expenditures are investments in assets that provide long-term benefits. These assets, such as machinery, equipment and real estate, are expected to contribute to an entity's revenue generation over an extended period. Rule 8 of the Delegation of Financial Power Rules also classifies expenditure on equipment as expenditure of capital nature. However, the TAG in January 2020 decided that the equipment and accessories acquired under the Clinical Trial Networks vertical would be recorded under the recurring head of expenses. Audit noted that equipment valued at ₹1.59 crore was incorrectly booked as revenue expense. Due to this decision, both the asset ownership and valuation details of these capital assets were not reflected in the books of accounts of the Mission.

While accepting the Audit observation, BIRAC noted the observation (February 2025) for compliance in the residual period of NBM.

b. Payment for infrastructure at the National Centre for Cell Science

NBM guidelines for disbursement state that 'Civil construction work will not be funded under the Mission and fund release will be undertaken only after brick-and-mortar work is completed as certified by an architect or an engineer.'

Audit, however, observed that in the project 'Establishment of Good Manufacturing Practices compliant National Repository for banking, safe deposit and supply of characterised mammalian cells for use in biopharma', initiated in October 2019 with a total budget of ₹24.46 crore, BIRAC funded the applicant for carrying out civil works on the project site.

BIRAC stated (February 2025) that the civil/construction costs were not supported by it.

The reply is not tenable since scope of work includes items of work of civil nature such as Civil and Mild Steel Structural and Architectural Services, Heating, Ventilation and Air Conditioning and Heating, Ventilation and Air Conditioning controls, Electrical High Tension,

Low Tension and Low Voltage services, Fire Safety and Firefighting, Environment, Health and Safety covering effluent treatment, sewage treatment and other aspects of Environment, Health and Safety.

c. Inconsistencies in fixing project start dates

The Standard Operating Procedures for managing Request for Proposals (RFPs) for the Grant-in-Aid (July 2018) state that the project start date should be the date the agreement is signed. However, it was observed in all the sampled 52 cases that the signatures on the Grants-in-Aid Letter Agreements (GLAs) were undated or even when provided with a date, separate dates were later decided as project start dates, generally much after the signing of the agreement. This inconsistent approach created confusion in financial disbursements and challenges in monitoring projects, as shown in cases listed in ***Annexure 9.***

d. Inordinate delays in implementation of projects

Out of the sampled 52 projects, Audit observed inordinate delays in eight projects, ranging from 12 months to 48 months, as detailed in ***Annexure 10.*** It was seen that an amount of ₹74.79 crore had been released for these eight projects cumulatively till March 2024.

Such delays not only disrupted the project schedule but also increased the risks associated with these projects, such as the evolving biopharma market, technology obsolescence, unforeseen events and opportunity costs. BIRAC was unable to devise any mechanism to address these delays. BIRAC provided (February 2025) factual positions of some of these projects in its response.

2.1.4.5 Monitoring

Monitoring is an essential activity for tracking the Mission's progress against set goals, identifying the potential issues early on, making necessary adjustments to stay on track and ensuring the delivery of results in time within budget and within the defined scope. The Cabinet Note and the Expenditure Finance Committee of the Mission envisaged different committees to oversee its implementation and progress assessment.

i. Lack of action on recommendations of the high-level committees

a. Steering Committee

BIRAC was to establish a Steering Committee chaired by the Secretary of the Department of Biotechnology, with World Bank and BIRAC members to provide high-level policy advice and

facilitate the coordination of project activities. The Steering Committee was to meet at least once a year or as desired by the Chairman of the Committee.

Audit observed that while the Steering Committee had provided many recommendations that could have played a pivotal role in achieving the envisioned outcomes of the Mission, most of these recommendations were not followed up on by BIRAC. These included-

1. The recommendation for the creation of a well-thought-out impact measurement matrix for the Mission, to develop a road map for the next five years of the Mission. In its reply, BIRAC has provided an impact report (February 2025). Audit, however, noted that no impact measurement matrix was prepared.

2. The recommendation to develop a road map for the next five years, which listed out the forecast for the new products to be developed, so that the regulatory system could be geared up to meet future requirements. While accepting the Audit observation, BIRAC in its reply (February 2025) stated that the suggestion shall be implemented in the residual period.

3. The recommendation to develop a capacity matrix of SAG and TAG and to define a skill set for the PMU. Audit noted that none of these recommendations were followed up. The reply furnished by BIRAC (February 2025) was silent about the formation of capacity matrices for SAG/TAG.

4. The Committee also made recommendations for the establishment and strengthening of labs for animal disease models, Preparation of a techno-feasibility document before publication of the RFPs and Engagement of an independent agency for performing impact assessment on people who had been trained under the Mission. Audit noted that none of these recommendations were complied with by BIRAC. While accepting these audit observations, BIRAC stated (February 2025) that improvements had been noted for future compliance.

Audit noted that these recommendations were made at the beginning of the Mission and were crucial for the attainment of the vision and objectives of the Mission. ***Annexure 11*** of the Report highlights 16 more instances wherein recommendations of the Steering Committee were either not followed or followed partially.

In its reply, BIRAC claimed that (February 2025) all the recommendations of the Steering Committee were followed up by the NBM team, and attempts were made to ensure compliance.

The reply may be viewed in light of the fact that NBM did not follow up on the recommendations of the Steering Committee in any of the 20 instances.

b. Technical Advisory Groups

The Technical Advisory Group (TAG) was to be chaired by an eminent scientist, with the participation of representatives of all concerned ministries/departments and stakeholders, including the World Bank and national and global experts. The Group was to meet at least once a year or as per the requirements of the Mission. As in the case of the Steering Committee, the TAG also had provided the Mission with important recommendations which could have had far-reaching effects. Audit observed that 22 out of 312 recommendations made by the Group were not followed up. These have been listed in ***Annexure 12***.

In their response (February 2025), BIRAC acknowledged that TAG's recommendations were pivotal. However, detailed responses to the Audit observations were not provided.

c. Project Monitoring Committees

Project Monitoring Committees were to be formed within three to four months of the sanction of each project. These committees were required to provide technical advice to the grantees in the form of recommendations.

Audit observed that the same Project Monitoring Committee members had monitored several of the Mission's projects. A total of 93 Project Monitoring Committees had been formed under the Mission till March 2024. Further test checks of the sampled projects revealed that Project Monitoring Committee recommendations were not followed up. Some of these instances are detailed below.

1. In the project 'Indigenous Renal Care Solutions- A Critical Technology Development from Pumps to Dialysis Machines', the Project Monitoring Committee in September 2019 recommended more regular reviews of the project every four months while grading the project as 'Poor'. The project grantee was further recommended to be connected by NBM to Vikram Sarabhai Space Centre, Central Manufacturing Technology Institute or the Liquid Propulsion System Group of the Indian Space Research Organisation. Audit noted that BIRAC did nothing in this regard and the project too did not progress further. BIRAC confirmed Audit observations and stated (May 2024) that the connection could not be done due to project foreclosure. It was noted that no steps were taken by the NBM team even during the time preceding the decision to foreclose the project.

2. Similarly, in the Project titled 'Translational Research Consortium for Establishing Platform Technologies to Support Prophylactic and Therapeutic Strategies for Dengue Discovery to Proof-of-Concept', the Project Monitoring Committee recommended in April 2022 the clinical sites, Manipal Academy of Higher Education (MAHE) and Christian Medical College (CMC), Vellore along with Centre for Development Studies and Activities and International Centre for Genetic Engineering, should fix standard timelines for sample-collection, shipment and receipt at International Centre for Genetic Engineering. The recommendations were, however, not complied with.

BIRAC responded (February 2025) that as a tertiary care hospital, CMC didn't expect a significant number of asymptomatic individuals to be sampled and Manipal Academy of Higher Education was tasked with collecting asymptomatic samples. However, due to the COVID-19 pandemic, all such protocols were cancelled for community surveillance and the Dengue sample collection was affected. After that, in a 1.5-year timeframe, the consortium attained the necessary results, rendering the need to collect asymptomatic samples unnecessary. Subsequently, the PMC advised to focus on symptomatic collection. Thus, Manipal Academy of Higher Education redirected its efforts towards collecting symptomatic and follow-up samples.

However, Audit noted that the Project Monitoring Committee had made the recommendation to collect asymptomatic samples in April 2022, around a year after the retreat of the COVID-19 pandemic. BIRAC's response regarding the Manipal Academy of Higher Education having attained the necessary results by then was, therefore, factually incorrect. Further, the reply was silent about compliance with the Committee's recommendations by the Centre for Development Studies and Activities and the International Centre for Genetic Engineering.

Recommendation 3:

BIRAC should set up a clear and reliable system to make sure that all recommendations from its main committees and advisory groups are followed up on in a timely and organised manner.

ii. Deficiencies in the functioning of Programme Management Unit

As per EFC Note (January 2017), the PMU was to work as an operational and functional arm for the Mission to oversee and monitor the programme implementation and progress. Audit found issues in monitoring by PMU in eight out of the 52 sampled projects. The issues ranged from the grantees not contributing their share and running the project only on BIRAC grants

(two cases of ₹7.17 crore), non-scrutiny of the expenses incurred by the grantee leading to non-surety whether the grants were utilised for the project or not (five cases involving ₹47.23 crore) and non-appointment of the representatives of BIRAC in the Governing Body of the company (one case). Other issues included lack of progress in the project, failure to connect the grantee with recommended public/private sector facilities. There were also instances of grantees not operating the no-lien account, not providing Utilisation Certificates and Statements of Expenditure and delays in project progress due to lack of interaction with regulatory bodies. These cases have been illustrated in ***Annexure 13.*** The findings reveal critical gaps in monitoring and follow-up of the Mission projects, which resulted in delays and potential project failures.

iii. Irregular processing of project- closure as foreclosure instead of termination

Section 3.12 of NBM's Standard Operating Procedure stated that the pre-exit process was to be in the form of foreclosure and termination. In case of project implementation not being viable on technical grounds, the terms of foreclosure were to be applicable. The decision of the foreclosure could be recommended by Project Monitoring Committee where it was found that the Project or any Project component was not likely to lead to successful completion. In all the foreclosure cases, the Fund Recipients were to immediately refund to BIRAC any Grants-in-Aid unutilised out of BIRAC's disbursements.

Under the termination process, the Standard Operating Procedure stated that the clause was to become applicable if there was any breach of the Grants-in-Aid Letter Agreement. In the event of termination, no further disbursement was to be made by BIRAC. The Fund Recipients were to return the amount of Grant-in-Aid already availed of from BIRAC with additional simple interest at the rate of 12 *per cent per annum* within 30 days of termination of the Letter Agreement. In case of failure to repay, the amount could be recovered by initiating any procedure available in law.

Thus, the only condition under which a project could warrant foreclosure was its established unavailability on technical grounds with the approval of the Mission Director.

Audit noted that in five of the 52 sampled projects, BIRAC allowed the grantee to keep the grants without any output by foreclosing the projects instead of terminating them, though in all these cases the grantees had not adhered to the Grants-in-Aid Letter Agreement conditions, which warranted termination. However, for none of these projects, evidence of the unviability of their implementation was found in the records. This resulted in ₹8.38 crore remaining unrecovered from the grantees, as detailed in the table below.

Table 10: Losses due to foreclosure of the projects warranting termination

Sl. No.	Project name	Start date	Scheduled completion date	Total cost *(₹ in crore)*	Grant released *(₹ in crore)*	Date of foreclosure	Total recovery due in case of termination* *(₹ in crore)*
1.	To develop low-cost biosimilar Palivizumab	19 Nov 2019	18 Oct 2022	23	3	4 Oct 2021	0.67
2.	Bio-better Therapeutic for a Genetic Disorder	8 Sep 2020	8 Sept 2022	2.48	1.24	18 Apr 2022	1.70
3.	Electrochemical Platform for COVID-19 Antigen Test	28 Dec 2020	28 Aug 2021	1.50	0.30	29 Aug 2022	0.33
4.	Development and Manufacturing of Slip ring, useful for Diagnostic CT and Ring Gantry-based Radiotherapy equipment	7 Dec 2018	6 Dec 2019	0.60	0.12	18 Mar 2021	0.15
5.	To develop low-cost biosimilar Ustekinumab was received from Serum Institute of India Pvt. Ltd. (SIIPL)	19 Nov 2019	18 Nov 2023	66.98	9.38	23 Oct 2024	5.53

**** including interest to be recovered***

The foreclosure order of the project titled 'To develop low-cost biosimilar Palivizumab' *inter alia* states that 'The Company has not progressed to achieve this objective as the project was kept on hold since March 2020 and all the resources were reallocated to COVID-19 project.' Audit noted this was a case of reallocation of resources and not of the project being unviable on technical grounds.

Similarly, in the project 'Bio-better Therapeutic for a Genetic Disorder', the SAG on 17 December 2021 expressed concern over the slow progress of the project and unanimously agreed that failure to progress satisfactorily at the next review meeting should result in the termination of the project. In the subsequent SAG meeting, disappointment over the project's progress was recorded. However, the project was eventually recommended for foreclosure instead of termination, as recommended earlier.

It was further noted that in the remaining three cases, the projects were foreclosed after their stipulated dates of closure. Audit is of the view that the unviability of a project cannot be established after its full term.

BIRAC has stated (February 2025) that projects were foreclosed as per the GLA condition following due process. The reply needs to be viewed in light of the fact that in all these cases, the projects did not progress due to the grantee's not adhering to the GLA provisions and in none of these cases was the project proven to be technically unviable, which was the necessary condition for granting the benefit of foreclosure to the grantee.

Recommendation 4:

The decision to terminate or foreclose the project should be based on Standard Operating Procedures and the same should be taken after proper deliberations.

2.1.5 Outcome

Out of 139 projects supported by the Mission, products were expected to be launched under 87 projects[14]. BIRAC has provided a list of 13 projects under which products have been successfully launched. However, no documentary evidence was provided for the same. Audit found that the Mission faced challenges in fully ensuring affordability, establishing a sustainable biopharma environment, maintaining benefits post-exit, fostering robust connections between industry and academia and promoting innovation within the biopharmaceutical ecosystem. The issues noted in this context are detailed below.

2.1.5.1 Affordability aspect

The development of affordable and accessible biopharmaceuticals (vaccines and biosimilars), medical devices and diagnostics relevant to the public health needs of India was the foremost aim of the Mission. With this objective, NBM did not leverage the costing offers made by the grant applicants to ensure the affordability of the final product in the market.

In eight of the 52 projects examined by Audit, either the Grants-in-Aid Letter Agreements had no clauses on the affordability of the final product/facility nor any work toward freezing an affordable price commitment from the grant applicants. This left it to the choice of the grantee whether to continue providing affordable services and products after the Mission exited from the operations or even before the closure of the Mission, as detailed in the table below.

[14] ***Medical Devices (28 projects), Vaccines (20 projects), Scientific Research (18 projects) and Biosimilar (21 projects). No products were expected out of Shared Facilities (23 projects), Clinical Trial Network (16 projects), Training (six projects) and Technology Transfer Offices (seven projects) verticals.***

Table 11: Absence of affordability clauses in the Grants-in-Aid Letter Agreement

Sl. No.	Project	Observation
1.	Production of safe and effective oral cholera vaccine of global GMP standards in India through Industry Academia partnership to meet India's supply needs	No commitments on the affordability aspect of the final product were obtained from the grantee before the commencement of the project.
2.	To develop a safe, immunogenic and stable vaccine for all populations against the novel coronavirus COVID-19, which is affordable and accessible for all countries	No price agreement was entered into with the grantee to ensure the affordability of the final product.
3.	Process development and commercialisation of Recombinant Human Albumin	In the SAG meeting (December 2022), the experts advised that the company should look into the Cost of Goods Sold (COGS) to make it a viable product. However, the pricing aspect of the product was not explored, and no such clauses were included in the GLA.
4.	Phase III Clinical Trial- Comparative Study to Test the non-inferiority of Biosimilar Liraglutide manufactured by Novo Nordisk in Patents with Type 2 Diabetes Mellitus	No affordability clause was entered into the agreement made with the applicant.
5.	Plasma fractionation process for the production of albumin, immunoglobulin and other products for therapeutic uses	The pricing aspect of the product was not explored and no such clauses were included in the GLA.
6.	Product development of in-house developed Insulin Glargine towards commercialisation	There were already many players in the market for this biosimilar. The grantee was allowed to keep changing its cost reduction offerings due to the non-freezing of the commitments at various points in time. As of February 2025, Insulin Glargine was already available in the market at a 30 *per cent* discount to the innovator price and there was no price commitment obtained from the grantee. Therefore, the project is no longer financially viable and is proposed to be closed.
7.	Shared facility	Although the GLA did not have any provision for providing differential rates to academia, start-ups and industry, the company claimed that it had been providing differential rates. However, the duration for which such discounts would be continued was at the discretion of the company.
8.	Development of an IT Platform	BIRAC had no mechanism to ensure that differential rates were charged by the grantees from academia and industry, as committed by them to ensure affordable services to academia. BIRAC (February 2025) has quoted one case where it has provided software support to the National Institute of Pharmaceutical Education and Research, Ahmedabad, at no cost. Reply may be viewed in the light of the fact that such support was extended only to one member of academia and reply is silent about the non-inclusion of the affordability clause and discount to academia users/start-ups in the Grants-in-Aid Letter of Agreement itself.

Recommendation 5:

The Department of Biotechnology, with the help of BIRAC, should determine a suitable formula using which grantees of the Mission should be bound to extend definite benefits to the public. The formula could be judiciously chosen to factor in the grants received by the grantee and grantee contributions to the project.

2.1.5.2 Continuity plans

The Mission envisioned to enable the Indian Biopharma Sector to become globally competitive over the next decade and transform the health standards of the Indian population for years to come. The Mission was, thus, implicitly planned to have long-lasting effects which were to continue much beyond its life.

However, the Mission's exit was not planned in a manner to ensure lasting benefits to the grantees in specific or the Indian population in general and it was run as a fund facilitator for the grantees without ensuring that the sustainability of the benefits derived or the facilities created from the Mission are available to the country's population. Even the immediate sustainability issues of the ongoing projects at the end of the funding relationship with the grantees were not addressed.

Audit noted that BIRAC did not prepare a roadmap to handhold and guide the grantees towards self-sustainability and in the process, create lasting resources for the country.

i. For the project 'Translational Research Consortia for Chikungunya Virus', the TAG recommended (November 2018) to support the facility with the Department of Biotechnology funds after the completion of funding from NBM. Although this recommendation was made at the project proposal stage, this decision was not taken up with a subsequent proposal to the Department of Biotechnology.

BIRAC informed (February 2025) that the institutes under TRC Dengue and Chikungunya are under the Department of Biotechnology and that this information will be shared with them to ensure resource support for sustainability.

ii. In the same project, creation of a repository/biobank for collected samples and material in a fee-for-service model was envisaged. However, no plan for stable long-term availability of this service and no evidence regarding fulfilment of this objective in terms of actual usage, even over the short term, was available on records. Also, BIRAC did not attempt to estimate what scale of sample/material numbers would make the

development and availability of a fee-for-service repository/biobank viable and useful for the industry.

In its reply, BIRAC has stated that (February 2025) Manipal Academy of Higher Education is seeking partnerships with academic institutions, research organisations and pharmaceutical companies to utilise the samples and initiate research related activities. A well-structured fee-for-service model will be implemented to generate revenue, efficient sample management practices will be employed to minimise cost and optimise storage and Manipal Academy of Higher Education will establish guidelines for data sharing to ensure the responsible and ethical use of the biobank's resources. Audit noted that all these actions are desirable and were required to be planned long before the implementation of the project.

iii. TAG recommended (June 2019) the incorporation of clauses under all the Grants-in-Aid Letter Agreements that the revenue generated should be used towards the sustainability of all the Good Laboratory Practices Analytical Labs after the grant period; however, the same was not done.

BIRAC assured (February 2025) that revenue generation clauses are now being included in the new Grants-in-Aid Letter Agreements.

iv. In the project 'GLP-compliant analytical facility at Council of Scientific and Industrial Research-Indian Institute of Chemical Technology', the TAG recommended (June 2019) to ensure that the business model of the facility works towards sustainability and viability and to discuss the facility establishment under NBM with Council of Scientific and Industrial Research. Although this recommendation was made at the project proposal stage, no communications were made by BIRAC in this regard.

BIRAC has assured in its reply (February 2025) that CSIR is part of the NBM Steering Committee and due note on NBM-funded CSIR facilities will be provided to the Steering Committee and recommendations on the continuation and sustenance of these facilities will be sought.

Recommendation 6:

The PMU should plan and ensure the self-sustainability of facilities created in the Mission to ensure that they remain viable in the future.

Recommendation 7:

A shared understanding of the Mission objectives must be established at the decision-making level to ensure that the Mission delivers quick results within its remaining timeframe. A feedback mechanism should be established to review insights and lessons from unsuccessful projects.

2.1.6 Conclusion

While acknowledging the efforts put in by the BIRAC team in attempting to meet mammoth targets of the Mission with the bare minimum manpower, Audit noted that the initiative has been significantly hampered by persistent challenges. Sustained shortage of capacity within the Programme Management Unit from the outset has hindered its operations and oversight, contributing to delays, limited competition in project selection and insufficient coordination with other sectors. The Mission has struggled to fully implement the valuable policy guidance from the Steering Committee and the recommendations of the Technical Advisory Group, missing opportunities to strengthen its impact. Monitoring and evaluation processes have fallen short of expectations, with inconsistent follow-up on project progress and a need for greater accountability. Addressing these shortcomings remains essential to realising the Mission's potential for India's biopharma sector.

CHAPTER III
Department of Scientific and Industrial Research

3.1 Blockage of funds to the tune of ₹1.43 crore

Lack of timely punitive measures by the Central Institute of Mining and Fuel Research resulted in non-achievement of intended objectives and blocking of ₹1.43 crore for more than five years.

Central Institute of Mining and Fuel Research is a constituent laboratory, under the aegis of Council of Scientific and Industrial Research (CSIR), which aims to provide R&D inputs for the entire coal-energy chain encompassing exploration, mining and utilisation. The Institute floated an open tender in February 2017 for purchasing a 20 litres explosion chamber for a project[15] to study and optimise coal dust explosion parameters[16] in laboratory conditions. Only one bid was received at that time. On the Technical and Purchase committee's recommendation, the tender was refloated in May 2017 and two bids were received. After evaluating all the technical aspects of the tender, the Institute awarded the Purchase Order to M/s ANKO Trading Ltd., Warsaw, Poland (Supplier) for procurement of '20 litres Explosion Chamber with all accessories' at the cost of 2,50,000 Euros in January 2018.

As per the terms and conditions of the Purchase Order, the complete set with all accessories was to be delivered within 16-20 weeks from the date of opening of the Letter of Credit. M/s Biogentek BG (I) Pvt. Ltd., the Indian Agent, was to pick up the imported consignment and deliver the complete set at the Institute. The installation and commissioning were to be completed within 30 days of delivery of the consignment.

Further, Clause 4 of Purchase Order stipulated that 'if the firm failed to get the equipment installed, commissioned and demonstrated successfully at the Institute within the scheduled time, the supplier was to take back the equipment at their own cost after refunding the entire amount incurred by the Institute for importing the equipment along with interest. The firm was

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[15] ***Titled 'Development of guideline for prevention and mitigation of explosion hazard by risk assessment and determination of explosibility of Indian coal incorporating risk-based mine emergency evacuation and re-entry protocol'***

[16] ***Determination of different parameters of coal dust explosion, viz., maximum explosion pressure, rate of pressure rise, minimum explosible concentration of coal dust, minimum oxygen concentration required for explosion, optimum particle size of coal dust for explosion in laboratory conditions for selected samples by 20 litre Explosion Chamber and finally, to find out explosibility dust constant that characterises the explosibility of coal dust.***

also to be blacklisted by all the CSIR Laboratories. Both the manufacturer and the Indian Agent were to be held responsible for such failure.

Audit observed that the Supplier had acknowledged the Purchase Order in January 2018. A Letter of Credit for 250000 Euros was opened in June 2018. The 20 litres explosion chamber (equipment) was received at the Institute in December 2018 and 80 *per cent* of the Letter of Credit value ₹1.63 crore (200000 Euros) was released to the supplier. However, the accessories, *viz.,* UPS System, Computers, Printers and Air Compressors were supplied by the Indian Agent in piecemeal till March 2019. Against the mandated time of 16-20 weeks, the entire set was delivered in 36-37 weeks (nine months). The Institute neither monitored the late delivery of the equipment and accessories nor did it impose a penalty for late delivery, in deviation from the terms and conditions of the Purchase Order.

Audit further observed that the Supplier failed to install/demonstrate the equipment. During the installation/training (August 2019), two sensors (Kistler Pressure Sensors) of the equipment malfunctioned. At the request of the Indian Agent, the Institute handed over the defective pressure sensors along with the amplifier and cables to the foreign supplier and it was assured (August 2019) that these sensors would be replaced within 8-12 weeks. However, the sensors were neither replaced nor the equipment installed till date (December 2024).

The Institute made several correspondence with the supplier and also approached[17] the Embassy of India, Poland, to pursue the matter with the supplier, which advised the Institute (May 2022) to initiate legal action against the supplier for deviation in contractual obligation. However, the Institute could not take timely legal action as per the Purchase Order (*i.e.,* imposing penalty/liquidated damage for late installation and commissioning and/or compelling supplier to take back the equipment after refunding the entire amount incurred by the Institute and blacklist the firm) except encashment of performance bank guarantee of ₹20 lakh in November 2022. The Institute stated that non-installation of the equipment had adversely affected their R&D activities and it finally decided to take legal action against the supplier and placed a demand note in May 2024 stating the firm will also be blacklisted from all labs of CSIR.

The Institute replied (June 2023) that the project objectives were met by the Computational Fluid Dynamics simulation study. The claim of the Institute is not tenable as it has been observed that, as per the project objectives, the Institute intended to validate Computational

[17] ***By First Secretary (Com.)/HOC, Embassy of India, Warsaw, Poland.***

Fluid Dynamics results with the experimental data, which was to be generated by performing an experiment with 20 litres explosion chamber. This experiment was never carried out due to the equipment being non-functional. The Institute had also agreed (September 2024) that if the experiments were performed, the results would have been validated and led to further refinement of simulation. Apart from this, other intended objectives such as determination of parameters of minimum explosible concentration of coal dust, minimum oxygen concentration required for explosion, *etc.,* were also not accomplished, which compromised the achievement of overall objectives of the project. Meanwhile, the project was marked as completed in April 2024 leaving no scope for further utilisation of the equipment. With a life cycle of 10 years, more than half of the life of the equipment had already elapsed without installation, with certain parts missing.

As a result of the absence of timely punitive actions, such as penalties or liquidated damages, ₹1.43 crore[18] remained blocked. Apart from the non-achievement of the intended objective of the project, Central Institute of Mining and Fuel Research also lost the opportunity to create a national facility for studying and optimising coal dust explosion parameters. The matter was again brought to the notice of the Institute (July 2024); however, no reply was received (March 2025).

3.2 Unproductive expenditure to the tune of ₹0.78 crore

Central Mechanical Engineering Research Institute, Durgapur procured one demonstrable prototype of Autonomous Underwater Vehicle up to sea operating depth of 1000 meters. The prototype was lying idle since its installation and was never demonstrated, which resulted in unproductive expenditure to the tune of ₹0.78 crore.

Central Mechanical Engineering Research Institute (CSIR-CMERI), Durgapur is the apex research and development institute for mechanical engineering under the aegis of the Council of Scientific and Industrial Research (CSIR). The Institute proposed to undertake a major multi-disciplinary, multi-laboratory network project titled 'Autonomous Underwater Robotics (UnWaR)' under the 12th five-year plan period. The core objective of the project was to carry out extensive research in multidisciplinary aspects of underwater robotic and vehicle technologies for higher depths, with demonstration through prototypes. This robotic research aimed to carry out underwater robotics research on deepwater Autonomous Underwater Vehicle (AUV) technologies through the development of functional prototypes for depth up to 1000 meters that might be utilised for the purpose of exploration of mineral resources, surveillance, inspection and detection of objects underwater with appropriate

[18] ***₹1.63 crore – ₹0.20 crore Bank Guarantee encashed.***

payload sensors. As a part of this project, an indent for the manufacturing of a demonstrable prototype of AUV-1000 (*i.e.,* for a 1,000 m depth rating) was raised in December 2015. The prototype was to be manufactured with special marine grade titanium and aluminium alloys suitable and sustainable for withstanding high pressure in an underwater environment, as per CSIR-CMERI design, with associated handling/lifting accessories. Accordingly, a tender was floated in January 2016 in which M/s Pentagon Rugged System, an India based firm, emerged as L-1 bidder.

CSIR-CMERI issued a Purchase Order of ₹0.67 crore in March 2016 to the firm for manufacturing and supply of the prototype to CSIR-CMERI within 120 days from the date of issue of the Letter of Credit. The firm submitted a proforma invoice of a cost of ₹0.76 crore, including value added tax of ₹0.10 crore. CSIR-CMERI opened a Letter of Credit with State Bank of India for an amount of ₹0.76 crore on 1 June 2016 (*i.e.,* after three months of placing Purchase Order) and the prototype was supposed to be delivered by 30 September 2016. However, the Institute did not receive the prototype within the scheduled time.

Audit observed that CSIR-CMERI did not monitor the progress of the work effectively. The Institute contacted the supplier for the first time only after 90 days (August 2016) of issuing the Letter of Credit and requested for delivery of the prototype on time. Thereafter, a team of CSIR-CMERI visited the supplier's site in November 2016, well after the scheduled date of supply and observed that the fabrication of the AUV-1000 prototype was yet to be completed. The team advised the supplier to complete the pending work and deliver the item, but without fixing any scheduled date for the same, to ensure that the supplier delivered the item urgently**.** Scrutiny further revealed that the supplier had requested in January 2017 to extend the Letter of Credit and delivery date as the work was not completed. The Project Leader/Nodal Officer had recommended extending the Letter of Credit till March 2017, which was also the project completion date.

CSIR-CMERI extended the delivery schedule by March 2017 stating the reason that due to administrative delay in creating Letter of Credit and manufacturing complexity associated with titanium and aluminium alloy, the prototype delivery got delayed/extended. The reason given by the Institute is not acceptable as the design of the prototype was prepared by the expert team of CSIR-CMERI itself and they were aware of the complexity very well.

Later, CSIR-CMERI sought (January 2017) an extension of one year in Sectoral Monitoring Committee meeting to complete sea trial of the prototype, but it was denied as the project's completion date was March 2017 and CSIR-CMERI had not received the prototype by then. The demonstration activity of the AUV-1000 was dropped from the scope of the project. Consequently, the targeted objective associated with the AUV-1000 remained unachieved.

The prototype was finally received by the Institute at the fag-end of the completion of project[19] after incurring an expenditure of ₹0.78 crore[20] and it was installed only in June 2017 after completion of the project. However, it was idle for the last seven years without any stipulated use in the future and the expenditure of ₹0.78 crore had become unproductive.

CSIR-CMERI replied (June 2023) that the Institute was exploring possible funding towards development of projects in the domain of underwater robotics in line with higher depth rated AUVs, where knowledge base of AUV-1000 might be utilised. It further reiterated (June 2024) that they were looking for alternate utilisation of the AUV-1000 prototype in other projects.

It is clear from the foregoing that while granting the extension till March 2017, which was also the project completion date, CSIR-CMERI understood that the material would reach after the completion of the project, rendering it useless for the project purposes and the proposal of possibly utilising it for future projects is an afterthought. However, since the AUV-1000 prototype was received by the Institute seven years ago and remained untested, CSIR-CMERI's assertion of utilising such technology for future projects lacks certainty and therefore there is an increased risk of obsolescence of the technology. Moreover, the warranty for the AUV-1000 prototype expired in 2019 and its operational status is uncertain.

Due to the failure of CSIR-CMERI to effectively manage this segment of the larger project, the AUV-1000 prototype could not be demonstrated and was lying idle since March 2017, defeating the purpose of robotic research work under deepwater (1000 meters) and rendering the expenditure of ₹0.78 crore incurred on the same, was rendered unproductive.

The observation was issued to the Department in July 2024; however, no reply has been received till date (March 2025).

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[19] ***Item received at CMERI on 21.3.2017. Project was completed in March 2017.***

[20] ***Including non-destructive testing charges of ₹1.25 lakh and Entry Tax of ₹0.76 lakh.***

3.3 Non-installation of Rainwater Harvesting System and Wastewater Recycling Facility

Non-installation of Rainwater Harvesting System and Wastewater Recycling Facility led to avoidable payment of water charges of ₹1.14 crore.

As per the Dynamic Groundwater Resources Assessment of India- 2022, the total Current Annual Ground Water Extraction is 0.36 billion cubic meters and Stage of Ground Water Extraction is 98.16 *per cent* in Delhi. Out of 34 assessment units (tehsils), 15 units (44.12 *per cent)* have been categorised as 'Over-exploited', seven units (20.59 *per cent*) as 'Critical', eight units (23.53 *per cent*) as 'Semi-critical' and four units (11.76 *per cent*) as 'Safe' categories of assessment units. Conservation of precious water resources is the pressing need of the hour in Delhi. Rainwater Harvesting is a very simple, viable and eco-friendly method of ground water recharge, thereby replenishing the depleting sub-surface water levels in the city.

In order to promote adoption of rainwater harvesting in the building premises, the Delhi Jal Board vide Delhi Water and Sewer (Tariff and Metering) Regulations issued in July 2012 stipulated that a rebate of 10 *per cent* in the total bill on water charges would be granted to all plots/properties built on an area of 2000 square meters or more and having rainwater harvesting system. The rebate would be 15 *per cent* on the total bill, if both the systems *i.e.*, Rainwater Harvesting System and Wastewater Recycling Plants had been set-up and were functional.

The above regulations were further amended in March 2016, to ensure that the government agencies make arrangements to harvest rain water within their premises. Failure to do so invited the tariff as applicable for the consumers of respective category increased by 1.5 times till the provision on rain water harvesting was made and intimated. These mandatory provisions for Rainwater Harvesting and consequent penal provisions were applicable from 1 July 2016.

Audit observed that National Physical Laboratory campus, under Council of Scientific and Industrial Research, comprised of a total roof top area of 29,903 square meters and the National Physical Laboratory Colony had a total roof top area of 29,263 square meters. National Physical Laboratory approached Delhi Jal Board in November 2019 for getting a rainwater harvesting structure installed in NPL campus. In August 2021 Delhi Jal Board provided the necessary drawings/conditions for the Rainwater Harvesting system. Considering these drawings of rain water harvesting structure, the National Physical Laboratory initiated a proposal with detailed estimates of ₹1.25 crore for the said work and submitted for approval to the Chief Engineer, Engineering Services Division-Council Scientific and Industrial

Research Complex in January 2022. In June 2023, Engineering Apex Committee of Council Scientific and Industrial Research decided to defer the project for one year. In compliance with Chief Engineer's direction (July 2023) to reinitiate a fresh proposal next year for 'in Principal approval,' National Physical Laboratory had resubmitted the proposal of revised estimates of ₹1.40 crore (April 2024) again, which was under processing for approval with concurrence of finance and onward submission to the Engineering Services Division-Council of Scientific and Industrial Research.

National Physical Laboratory continues to pay inflated monthly water bills to the Delhi Jal Board, missing an opportunity to save 10 to 15 *per cent* on total water charges. This could have been achieved by adhering to guidelines and constructing a Rainwater Harvesting structure with a wastewater treatment facility in its premises and in the National Physical Laboratory Colony. Moreover, the penalty for non-installation of the mandatory Rainwater Harvesting System, applicable with effect from July 2016 till date, would further lead to avoidable expenditure on this account.

Hence, National Physical Laboratory could neither install Rainwater Harvesting System which could conserve precious water nor avail the rebate available on such installation. This resulted in avoidable payment of ₹1.14 crore with effect from August 2013 to August 2024, as detailed in the ***Annexure 14.***

The observation was issued to the Department in August 2024. While confirming the billed amounts, NPL replied (May 2025) that it has more than 80 *per cent* green area which directly soaks up the rainwater and thus construction of Rainwater Harvesting system would be an inefficient use of money.

The reply may be viewed in the light of the fact that the total rooftop area of the NPL campus and colony is 59165.98 sq. m., which is far more than 500 sq. m., the maximum plot area up to which rainwater harvesting is not mandatory. Additionally, NPL had submitted (August 2021) the details of its rooftop area to Delhi Jal Board while seeking advice on the requirement of artificial recharge. Based on this input, Delhi Jal Board had provided NPL (August 2021) the design for a Rainwater Harvesting System required in the Laboratory. NPL, by not constructing the Rainwater Harvesting System, not only ignored the potential benefits of installing it in terms of ground water recharge and improvement in water level in the area in long term, but also was in non-compliance with Delhi Jal Board Regulations of 2016.

CHAPTER IV

Ministry of Earth Sciences

4.1 Unfruitful expenditure of ₹1.58 crore incurred as penalty

Indian National Centre for Ocean Information Services constructed and occupied the buildings without taking the Building Permission and Occupancy Certificate. This resulted in the payment of a penalty to the extent of ₹1.58 crore for the period 2014-15 to 2021-22.

The Greater Hyderabad Municipal Corporation Act, 1955, prescribes the Building Regulations in Hyderabad. Common Building Rules, issued by the Municipal Administration Department of the State, require Building Permission to be mandatorily obtained from the sanctioning authority before the construction of any building and an Occupancy Certificate is to be obtained before the occupation of the building. The occupier of the building is liable to pay property tax and unauthorised constructions attract penalties at 100 *per cent* of the property tax under Section 220A of the Regulations.

Indian National Centre for Ocean Information Services (INCOIS), an autonomous body under the Ministry of Earth Sciences in Hyderabad, applied for Building Permission for the construction of its main building in March 2003. Audit observed that without obtaining the requisite permission, INCOIS completed the construction and also occupied the building in September 2004. Subsequently, between 2011 and 2019, INCOIS undertook Phase 2 works of its main building and constructed and occupied 14 other buildings[21] on the same campus in a phased manner. This too was done without obtaining building permission.

In April 2016, when INCOIS approached the Greater Hyderabad Municipal Corporation to assess property tax payable, the Corporation responded in February 2017 with a demand notice, charging property tax from 2014-15 onwards and imposing a 100 *per cent* penalty for unauthorised construction of buildings. INCOIS paid the property tax with 100 *per cent* penalty amounting to ₹0.77 crore and decided to seek *post facto* approval for its buildings.

[21] ***Old Car Parking, Amenity Building, MP Hall, Guest House, Type C Quarters, Type D Quarters, Type D Spl. Oceansat-2 Antenna Building, Director's House, Main Substation, New Car Parking, Substation Housing Area, ITCOocean Atal Bhavan Academic Block, ITCOocean – Atal Athidhi Griha, International Training Centre Building.***

INCOIS corresponded with the Greater Hyderabad Municipal Corporation, requesting reassessment and waiver of penalties. The Corporation informed INCOIS categorically (February 2019) that it must pay penalties until obtaining the necessary construction permissions or regularisation. The Corporation also informed (March 2019) that it would not be possible to keep the Tax Assessment Notice on hold and reaffirmed the need for approvals or regularisation and continued to enforce penalties.

Audit further observed that INCOIS applied for permission in respect of one of the 14 buildings, the International Training Centre Building, only in October 2017. The construction of the International Training Centre Building was undertaken during the period 2014-2019 and the building was occupied in 2019. INCOIS secured the Building Permit in July 2021 and the Occupancy Certificate in October 2021. For the other buildings, INCOIS applied for regularisation to the Corporation only in November 2022, *i.e.,* nearly five years after the 100 *per cent* penalty was imposed, and obtained the Building Permit Order in February 2024.

Until INCOIS took necessary action for regularisation, the Corporation continued to levy penalties, as a result of which INCOIS paid a penalty of ₹1.58 crore to the Corporation for the period from 2014-2015 to 2021-2022. Thus, failure to obtain requisite building permissions and occupancy certificates before construction/occupation and subsequent delay in regularisation resulted in an avoidable expenditure of ₹1.58 crore in the form of penalty.

Ministry of Earth Sciences stated (November 2024) that INCOIS had received the building permission order for its existing structures in February 2024 and the occupancy certificate had been acquired for 10 buildings and for the other four buildings it would obtain it shortly. It added that construction/occupation was done without approvals since INCOIS had time-targeted schedules to complete the works and spend the amount, so as to serve the nation and humanity; Greater Hyderabad Municipal Corporation levied the charges as per the Act; taxes were paid under protest. It further added that no tax or charges were levied for 2004-2014, resulting in savings.

The justification of the Ministry of Earth Sciences that INCOIS completed the works and occupied the buildings to serve the nation and humanity is not acceptable since the Rules clearly mandated obtaining building permission and an occupation certificate. Further, the payment of statutory dues applicable as per Act/Rules is mandatory and non-levy or non-payment cannot be construed as savings to the organisation. All the more, the penalties paid for the period 2014-2022 are irrecoverable losses, which INCOIS could have avoided, had it taken timely action.

4.2 Non-realisation of ₹7.28 crore towards meteorological charges/statutory levies

Non execution of Memorandum of Understanding/Letter of Agreement resulted in non-realisation of ₹7.28 crore towards meteorological charges/statutory levies from Nanded Airport Private Limited/IRB Sindhudurg Airport Private Limited.

India Meteorological Department (IMD) under the Ministry of Earth Sciences, New Delhi, provides the necessary meteorological service based on the procedures laid down in the relevant International Civil Aviation Organisation's regulatory documents for air navigation operating through civil aerodromes in India. The service is provided through Aerodrome Meteorological Offices and Aeronautical Meteorological Stations functioning at various airports.

Further, Para 7.3 of Compendium of Central Government Services and Regulations for Greenfield Airport of Ministry of Civil Aviation stipulates that IMD shall recover the cost of the equipment, manpower and other support centres from the airport operator.

A Memorandum of Understanding (MoU) and a Letter of Agreement (LoA) was executed by Nanded Airport Private Limited[22] (NAPL) and IRB Sindhudurg Airport Private Limited[23] (ISAPL) in April 2010 and June 2017 respectively with IMD with a view to provide the Aviation Meteorological Services[24] and install all Airport Meteorological Instruments and deploy manpower as considered necessary for providing such services at Nanded and Sindhudurg Airport. The tenure of the Memorandum of Understanding/Letter of Agreement was for five years from the date of execution, *i.e.,* 27 April 2010 in case of NAPL and 20 June 2017 in case of ISAPL. As per the two agreements, the full cost of procurement, installation and annual maintenance charges of Airport Meteorological Instruments was to be reimbursed by NAPL and ISAPL to IMD along with salary and other allowances at Central Government rates, as admissible to IMD personnel posted at the two airports. The bill for reimbursement of salary and cost of Airport Meteorological Instruments was to be raised by IMD every six months to NAPL and every month to ISAPL and was to be reimbursed by airport operators within one month of raising the claim.

Audit observed that despite expiry of the contracts in April 2015 for Nanded Airport and June 2022 for Sindhudurg Airport, the same were not renewed. Further, NAPL refused to pay

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[22] ***Nanded Airport Private Limited is a company incorporated under the Companies Act,1956, having its registered office at Mumbai and is operating Nanded Airport.***

[23] ***IRB Sindhudurg Airport Private Limited is a company incorporated under the Companies Act 1956, having its registered office at Mumbai and is operating at Sindhudurg Airport.***

[24] ***Aviation Meteorological Services was provided by the Regional Meteorological Centre, Mumbai, a Regional Centre under the administrative control of IMD.***

the bills raised by IMD from April 2017 when Nanded Airport came under UDAN scheme. Audit also noted that ISAPL also refused to pay bills from January 2021[25]. They took a stand that the Airport Authority of India being the nodal agency for Regional Air Connectivity Scheme initiative had the sole responsibility of overseeing the provision of core functions like communications, Navigation and Surveillance Systems for Air Traffic Management and Meteorological functions (MET). Audit also noted that ISAPL refused to pay bills from January 2021 even though Sindhudurg airport first came under UDAN scheme in October 2021.

Therefore, a total of ₹7.28 crore, *i.e.*, ₹5.13 crore from Nanded Airport Private Limited[26] from March 2017 till March 2024 ***(Annexure 15)*** and ₹2.15 crore for IRB Sindhudurg Airport Private Limited from January 2021 till March 2024 ***(Annexure 16)*** was currently outstanding at Regional Meteorological Centre, Mumbai despite rendering continuous meteorological services and deploying manpower for the same at Nanded and Sindhudurg Airports.

Regional Meteorological Centre, Mumbai stated (April 2021) that IMD, New Delhi sought clarification from Airport Authority of India (January 2018) on cost reimbursement of Aviation Meteorological Services at Nanded Airport. Further, IMD, New Delhi wrote (September 2020) a letter to Ministry of Civil Aviation, New Delhi regarding signing of Memorandum of Understanding and non-payment of charges by Nanded Airport Private Limited. In reply (October 2020), Ministry of Civil Aviation, New Delhi stated that as per UDAN Scheme, Central Government, State Government and Airport Operators provide concessions to make flying affordable for the masses and requested IMD to waive off Aviation Meteorological charges.

IMD, New Delhi took up the matter again (January 2021) with Airport Authority of India, New Delhi to arrange a meeting with Ministry of Civil Aviation and Airport Authority of India to resolve the issue of non-signing of Memorandum of Understanding and non-payment of charges by Nanded Airport Private Limited for meteorological services to Nanded Airport.

Regional Meteorological Centre, Mumbai further stated (May 2024) that it could not stop aviation services since Secretary, Ministry of Earth Sciences had instructed IMD to not stop aviation services provided for different airports including Nanded and Sindhudurg Airports.

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[25] ***Regional Meteorological Centre deployed its manpower from January 2021 and started providing Aviation Meteorological Services from October 2021 to ISAPL.***

[26] ***Includes service tax from 2010 to 2015.***

Ministry of Civil Aviation, in February 2025, clarified that the UDAN scheme *per se,* does not have any provision for exemption of charges for meteorological services at Regional Air Connectivity Scheme airports.

Thus, Regional Meteorological Centre/IMD neither undertook adequate efforts for timely renewal of Memorandum of Understanding/Letter of Agreement nor withdrew/terminate Aviation Meteorological Services even after lapse of seven years with Nanded Airport Private Limited and more than two years with IRB Sindhudurg Airport Private Limited. Lack of definite action by Regional Meteorological Centre/IMD for renewal of Memorandum of Understanding/ Letter of Agreement resulted in non-realisation of meteorological charges/statutory levies of ₹7.28 crore up to March 2024.

The matter was referred to the Ministry in August 2024, their reply was awaited as of March 2025.

4.3 Avoidable payment of ₹0.73 crore due to inaccurate contract demand assessment

Inaccurate assessment of contract demand by Climate Research and Services, India Meteorological Department, Pune led to excess/avoidable payment of ₹0.73 crore.

Rule 21 of the General Financial Rules, 2017 prescribes that every officer handling public funds must ensure financial propriety, avoid unnecessary expenses and exercise strict economy.

Climate Research and Services, India Meteorological Department (IMD), Pune, entered into agreements with Maharashtra State Electricity Distribution Company Limited for High-Tension electricity supply for three of its offices, *viz*., Main Office, Ramdurg, Main Office, Shivajinagar and Automatic Weather Station, Pashan, for different periods. As per the agreements, India Meteorological Department, Pune, was liable to make minimum payment charges or actual consumption, whichever was higher. Maharashtra State Electricity Distribution Company Limited increased the minimum payment charges of the contract demand from 50 to 65 *per cent* from April 2020 to April 2022.

Audit observed that despite a contract demand ranging from 69 to 525 KVA across the three locations, actual consumption was very low and remained between 9 and 327 KVA, with the consumption at Pashan never exceeding 40 KVA. Consequently, IMD, Pune had to incur expenditure on account of payment of minimum payment charges at the rate of 50 to 65 *per cent* of the contract demand to Maharashtra State Electricity Distribution Company Limited, despite having very low consumption as detailed in the table below.

Table 12: Comparison of Contract Demand

Location	Contract Demand (KVA)	Actual Consumption Range (KVA)	Billing Period	Minimum demand range (KVA)	Avoidable Payment (₹ in crore)
Main Office, Ramdurg	69/201*	9 to 68	November 2014 to March 2023	35 to 131	0.15
Main Office, Shivajinagar	525	114 to 327	July 2017 to March 2023	263 to 341	0.28
Automatic Weather Station, Pashan	200	8 to 40	November 2014 to March 2023	100 to 130	0.30
Total					**0.73**

** From November 2021 contract demand increased from 69 to 201 KVA*

This resulted in excess payment of ₹0.73 crore due to underutilisation of minimum billing demands at the Main Offices in Ramdurg and Automatic Weather Station (Pashan) during the period November 2014 to March 2023 and at Shivajinagar during the period July 2017 to March 2023.

On being pointed by Audit (May 2023), IMD, Pune stated (August 2023) that they had requested Maharashtra State Electricity Distribution Company Limited to lower the contract demand for the Shivajinagar office from 525 KVA to 400 KVA. Further, justifying not decreasing the contract demand for the other two offices IMD Pune cited that Ramdurg Office had planned an Archival Centre and Automatic Weather Station and Pashan office had planned a wind tunnel and data server.

The reply may be viewed in the light of the fact that the contract demand could have been increased once the facilities were in place instead of doing the same in advance, thereby leading to avoidable payment. This is also substantiated by the fact that the actual consumption never exceeded the minimum contract demand even after the establishment of Archival Centre and installation of wind tunnel and data centre at Ramdurg and Pashan office, respectively.

Corroborating the Audit observation, after one and a half years (December 2024) IMD, Pune submitted online applications to Maharashtra State Electricity Distribution Company Limited for reduction of contract demand for Shivajinagar and proposed shifting Ramdurg and Pashan to low-tension connections.

Hence, despite being aware of lower utilisation, the IMD, Pune did not make efforts to revise contract demand resulting in excess avoidable expenditure of ₹0.73 crore.

The matter was referred to the Ministry in September 2024 and response was awaited as of March 2025**.**

CHAPTER V
Ministry of Environment, Forest and Climate Change

5.1 Subject Specific Compliance Audit of activities of Zoological Survey of India

5.1.1 Introduction

Biodiversity comprises the variety of all life on earth. India is a mega diverse country having nearly about 90,000 living species out of 1.7 million living species described worldwide. Global concern about loss of species and ecosystems led to the International Convention on Biological Diversity[27] which came into force in December 1993. The Convention on Biological Diversity (CBD) had three main goals, *viz.,* (i) conservation of biological diversity, (ii) sustainable use of its components and (iii) fair and equitable sharing of the benefits arising from genetic resources. India is a signatory to the Convention and is committed to fulfilling the objectives of the CBD.

Sustainable Development Goal 15 'Life on Land' was set with the purpose to protect, restore and promote sustainable use of terrestrial ecosystems and halt biodiversity loss.

Zoological Survey of India (ZSI) was established in 1916 as a National Research Institute for Zoology to survey and explore the diverse faunal resources leading to the advancement of knowledge of various aspects of animal life of India. ZSI is a subordinate office of the Ministry of Environment, Forest and Climate Change (MoEF&CC). ZSI also advises Government of India on all matters relating to wildlife and animal diversity in India. With a view to addressing the objectives of Convention on Biological Diversity, the Programme Advisory Committee (PAC) of Ministry of Environment and Forest (MoEF)[28] prepared (2001) the Strategic Plan of ZSI for the next 20 years and accordingly, redefined its earlier mandate of 1987. ZSI also prepared (2011) an action framework, *viz.,* Vision 2020, which was to serve as a help guide for ZSI to attain the goals decided upon for 10 years till 2020.

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[27] ***The Convention on Biological Diversity, a multilateral treaty was signed by 150 government leaders at the 1992 Rio Earth Summit and is dedicated to promoting sustainable development.***

[28] ***The name of Ministry of Environment and Forest was changed to Ministry of Environment, Forest and Climate Change vide notification dated 31 July 2014.***

The objectives of ZSI as per its revised mandate were as follows.

Primary objectives
➢ Exploration, survey, inventorisation and monitoring of faunal diversity in various states, some selected ecosystems and Protected Areas of India. ➢ Taxonomic studies of all faunal components. ➢ Status survey of Threatened and Endemic species. ➢ Preparation of Red Data Book, Fauna of India and Fauna of States. ➢ Bio-ecological studies on some important communities/species. ➢ Preparation of database for the recorded species of the country. ➢ Maintenance and development of National Zoological Collections. ➢ Training, capacity building and human resource development. ➢ Faunal identification, advisory services and Library services. ➢ Publication of study-results, including documentation of Fauna of India and Fauna of States
Secondary objectives
➢ GIS and Remote Sensing studies for recorded animal diversity as well as for selected threatened species ➢ Chromosomal Mapping and DNA Fingerprinting ➢ Environmental Impact Studies ➢ Maintenance of Museums at Headquarters and Regional Centres ➢ Development of Environmental Information System and Convention on International Trade in Endangered Species Centres ➢ Research Fellowship, Associateship and Emeritus Scientist Programme ➢ Collaborative research programmes on Biodiversity with other Organisations ➢ All India Coordinated Project on Taxonomy

5.1.1.1 Organisational Set up

ZSI is headed by the Director, assisted by scientists and administrative staff. The Headquarters of ZSI is located at Kolkata. There are 16 Regional Centres[29] located in different States/Union Territories of the country ***(Figure 4)***, headed by the respective Officers-in-Charge, who report to ZSI Headquarters.

Figure 4: Headquarters and Regional Centres of ZSI

5.1.1.2 Budget and Expenditure

The budget allocation and actual expenditure incurred by ZSI during the period 2018-19 to 2023-24 are detailed below.

Table 13: Budget and Expenditure

Year	Budget Estimate *(₹ in crore)*	Revised Estimate *(₹ in crore)*	Actual Expenditure *(₹ in crore)*
2018-19	64.50	68.00	67.30
2019-20	72.00	71.64	71.43
2020-21	72.00	60.32	60.12
2021-22	67.00	70.00	70.98
2022-23	78.75	82.00	84.46
2023-24	86.90	101.70	101.66

5.1.1.3 Manpower

Sanctioned Strength *vis-à-vis* Persons-in-position of ZSI Headquarters with its 16 Regional Centres from 2019 to 2024 is shown below.

Table 14: Manpower

Year (As on 1st April)	Sanctioned Strength				Persons-in-Position			
	S	T	A	Total	S	T	A	Total
2019	590	146	302	1038	333	50	169	533
2020	590	146	302	1038	317	47	157	521
2021	590	146	302	1038	304	43	149	496
2022	590	146	302	1038	307	39	159	505
2023	590	146	302	1038	388	38	152	578
2024	589	147	302	1038	400	48	153	601
S- Scientific, T- Technical, A- Administrative								

[29] *(1) Sundarban Regional Centre, Canning (2) Marine Aquarium Regional Centre, Digha (3) Estuarine Biology Regional Centre, Gopalpur-on-sea (4) Southern Regional Centre, Chennai (5) Marine Biology Regional Centre, Chennai (6) Western Ghat Regional Centre, Calicut (7) Freshwater Biology Regional Centre, Hyderabad (8) Western Regional Centre, Pune (9) Central Zone Regional Centre, Jabalpur (10) Desert Regional Centre, Jodhpur (11) High Altitude Regional Centre, Solan (12) Northern Regional Centre, Dehradun (13) Gangetic Plains Regional Centre, Patna (14) Arunachal Pradesh Regional Centre, Itanagar (15) North-Eastern Regional Centre, Shillong (16) Andaman and Nicobar Regional Centre, Port Blair.*

As can be seen from the table above, the vacancies in ZSI Headquarters and its 16 Regional Centres ranged between 42.10 *per cent* and 52.22 *per cent* during the period 2019-20 to 2023-24. This inevitably affects the deliveries on the primary objective of the ZSI as detailed in the following paragraphs.

5.1.1.4 Audit Scope and Sampling

Activities of ZSI were last reviewed by Audit covering the period 2005-14 and findings appeared as Para 6.1 of Audit Report no. 27 of 2014. In the present review, Audit attempted to report on the action taken by the Ministry/ZSI on the recommendations contained in that Audit Report and subsequent performance of ZSI on the related issues. The scope of the present Audit also covers instances pertaining to the period 2018-19 to 2022-23, as well as significant Audit observations that were noticed in the intervening period of 2015-18.

In addition to ZSI Headquarters, Kolkata, nine[30] out of the 16 Regional Centres, *i.e.,* 56 *per cent* of the centres were selected as sample for Audit based on the geographical locations and the ecological importance/diversity of the areas covered by the Regional Centres.

Audit Findings

5.1.2 Performance and delivery by ZSI on its Primary Objectives

Exploration, survey, inventorising and monitoring of faunal diversity in various States, selected ecosystems and protected areas of the country were identified as one of the Primary Objectives of ZSI. ZSI conducts surveys and monitors faunal diversity in different states, protected areas and ecosystems through its regular research programmes. In order to inventorise the specimens of different areas, particulars of the collected specimens are entered in the records as an unnamed collection or unidentified collection after completion of the survey. Thereafter, taxonomic study on the collected species is conducted based on morphology and molecular tools to solve the possible species complexes. Once the collected specimens are taxonomically identified, a unique registration number is issued to the identified specimen and recorded as the named collection or identified collection. The final stage is publication of the survey results which are widely circulated as the main medium for dissemination of the research outputs. ZSI also monitors faunal biodiversity through measurement of present changes of biodiversity in its various forms (genes, taxa, structures, functions, ecosystems).

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[30] ***1. Northern Regional Centre, Dehradun (Northern Region), 2. North Eastern Regional Centre, Shillong (North-Eastern Region), 3. Freshwater Biology Regional Centre, Hyderabad (South-Eastern Region), 4. Southern Regional Centre, Chennai (Southern Region), 5. Marine Biology Regional Centre, Chennai (Southern Region), 6. Western Regional Centre, Pune (South-Western Region), 7. Desert Regional Centre, Jodhpur (Western Region), 8. Central Zone Regional Centre, Jabalpur (Central Region) and 9. Andaman and Nicobar Regional Centre, Andaman.***

5.1.2.1 Exploration, Survey and Inventorisation, Monitoring of faunal diversity in states, Protected Areas and ecosystems of India

Programme Advisory Committee (PAC) advises MoEF&CC on matters related to Environmental and Forest Programmes, including their planning, implementation and monitoring. PAC prepared (2001) the Strategic Plan of ZSI for the next 20 years, which included an extensive and time bound plan covering the period from 2001 to 2020 for exploration, studies and preparation of Faunal Accounts. According to the exploration plan prepared by the PAC, a survey of faunal resources of 13 states/UT, 25 ecosystems and 46 protected areas were to be completed by 2012. CAG Audit Report No. 27 of 2014 (Para 6.1) on the Activities of ZSI, while reviewing the progress made in the implementation of the Strategic Plan with reference to the intermediate timeline of 2012 in exploration, identification and monitoring of faunal diversity, highlighted certain lapses such as (i) non-achievement of targets of survey and publication of Faunal Accounts, (ii) absence of standard methodologies for conducting survey, (iii) monitoring of faunal diversity, (iv) shortfall in taxonomic description of animal specimens and (v) status survey of endangered and threatened species, in the context of the Strategic Plan.

In the present review, Audit has reported on the action taken by the Ministry/ZSI on the assurance given by it based on the Audit findings contained in the Audit Report No. 27 of 2014 (Para 6.1) and subsequent performance of ZSI on the related issues. The present Audit scope also encompasses the targets of the Strategic Plan with respect to the survey during the subsequent period, *i.e.,* beyond March 2014.

5.1.2.1(a) Completion of survey and publication of Faunal Accounts

Global concern about the loss of species and ecosystems led to the International Convention on Biological Diversity (CBD). One of the three main goals of the CBD is the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of genetic resources. Translating this goal to action through conducting a survey and subsequent publication of study-results, including documentation of Fauna of India and Fauna of States, is one of the primary objectives of ZSI, as reflected in the revision of its mandate in 2001 and its Strategic Plan.

Audit, however, observed shortfalls in completion of Surveys and publication of Faunal Accounts in States, Ecosystems and Protected Areas as given in table below.

Table 15: Shortfalls in completion of Surveys and publication of Faunal Accounts in States, Ecosystems and Protected Areas

Achievement in Publication of Faunal Accounts as reported in Para 6.1 in Audit Report no. 27 of 2014	Present Status of publication of Faunal Accounts that were pending as per Para 6.1 in Audit Report no. 27 of 2014	Achievement of Targets for conducting Surveys and Publication of Faunal Accounts, set beyond 2014
States		
Against a target of States publication of Faunal Accounts of 13 states, publication was completed for eight states only till March 2014.	• Of the remaining five states/ UTs, ZSI had conducted the survey and published the Faunal Accounts for four states ***(Annexure 17***). • Despite assurance given by the Ministry, in their Action Taken Note in August 2016, that the publication with respect to Chandigarh, which was initially targeted for 2012, would be done by March 2018, the same is still pending.	• Survey was conducted in all the targeted five states during the period 2016 to 2024 albeit with delays ranging between one to eight years in conducting surveys in four States (***Annexure 18***). • Although details of studies undertaken in connection with these surveys were called for by Audit, the same were not furnished by ZSI. • Audit also observed that of the five states, publication was brought out for only two States. ZSI stated (November 2024) that in case of Jammu and Kashmir authors had not submitted research output in the Publication Division for initiating the printing process. It added that manuscript was submitted for Bihar and Jharkhand on 16 October 2024 and 9 April 2021, respectively and they would be printed in 2025.
Ecosystems		
Against the target of 25 ecosystems, ZSI published the Faunal Accounts with respect to four ecosystems by March 2014.	Of the remaining 21 ecosystems, publication of Faunal Accounts has been completed for 19 ecosystems and in two ecosystems, the authors did not submit the same to the Publication Division for printing. Out of 19 published Faunal Accounts, there is a delay in 17 Faunal Accounts, ranging between 2 and 16 years. Of the other two ecosystems which are yet to be published, there is a delay of more than 10 years from their scheduled publication. (***Annexure 19***)	• Out of the 14 ecosystems targeted, details of the survey conducted were available for 11 ecosystems only. • There were delays ranging between three and six years in conducting surveys in four ecosystems. • With regard to the 11 surveys conducted, there were delays in publication of findings ranging between three and six years, in three cases. (***Annexure 20***).
Protected Areas		
Against the target of 46 Protected Areas, Faunal Accounts of 14 Protected Areas were published till March 2014. Out of the remaining 32 Protected Areas, in respect of four Protected Areas, surveys were completed even before the recommended date of start of the survey.	Out of the four Protected Areas in which the survey was reported to be completed before the recommended date of start of survey, publication is still awaited in one case, though the Ministry in its ATN (2016) stated that publication would be made by 2018.	• Of the 41 Protected Areas, survey has been completed for 19 Protected Areas and for one Protected Area, surveys were going on as of October 2024.

Achievement in Publication of Faunal Accounts as reported in Para 6.1 in Audit Report no. 27 of 2014	Present Status of publication of Faunal Accounts that were pending as per Para 6.1 in Audit Report no. 27 of 2014	Achievement of Targets for conducting Surveys and Publication of Faunal Accounts, set beyond 2014
The publications cited also belonged to the earlier period of the survey and were not in accordance with the planned objectives of PAC. Out of these four, publication is still awaited in case of Mahatma Gandhi Marine National Park, Andaman and Nicobar Islands (Sl. No. 34, old report page no. 125 of Report no. 27 of 2014). Though survey was completed, but publication is awaited. Ministry in its ATN (2016) stated that the publication will be made by 2018. Ministry in its reply (October 2024) has not offered any comments on it.	Out of remaining 28 Protected Areas, publication has been brought out for eight Protected Areas only whereas for 15 Protected Areas, publication is pending and with respect to five Protected Areas, information was not furnished (***Annexure 21***). There was delay in all eight published Protected Areas' Faunal Accounts, ranging between 1 and 13 years. In seven pending cases, three publications were planned for 2024 and four were proposed to be published in 2025. Further, in eight pending cases, manuscripts were not submitted by authors for printing.	• Of the remaining 21 Protected Areas, ZSI has taken up survey in two Protected Areas through the Annual Programme of Research and in 19 Protected Areas, the survey status was not furnished by ZSI. • Out of the 19 completed surveys, publication of research output has been completed for 12 Protected Areas. • There was delay in conducting surveys (one to seven years) in 12 cases and a delay in publication of two and four years in two cases. (***Annexure 22***)

Therefore, though there was a comprehensive time bound plan for carrying out survey and publication of study results in accordance with the mandate, ZSI did not keep up with the targeted schedule of work and lagged behind in the achievement of its Primary Objectives as per its revised mandate. This has an impact on creating scientific record and a knowledge bank of the state of faunal biodiversity, which is critical for the conservation of faunal species.

5.1.2.1(b) Irregularities in publication of research results

One of the primary objectives of ZSI is also 'Publication of study results, including documentation of Fauna of India and Fauna of States'. The publications of ZSI have played a pioneering role in contributing to the scientific knowledge on Indian Zoology, taxonomic knowledge in particular. The ZSI publications provide a platform for the researchers/ scientists not only of ZSI but also of other institutions to publish their results of zoological studies of scientific nature, taxonomy and systematics in particular, thereby contributing to the knowledge base on Indian fauna. As has been reported in Audit, there are persistent delays in publications intended to be brought out by ZSI. Audit analysed the process to identify the reasons for such delays.

The flowchart of activities in ZSI from receipt of manuscript to its publication by the Publication Division is given in ***Figure 5***.

ZSI does not have its own prescribed norms for publication. Instead, it follows standard methods/norms widely accepted in India and world. Audit, however, observed that due to not following the norms properly, huge number of manuscripts were lying in Publication Division for a long time, pending final publication. Scrutiny of records of Publication Division of ZSI Headquarters revealed that as of July 2023, manuscripts of 112 research programmes, though submitted during 2011 to 2022, were still pending for publication due to (i) Delay in sending manuscript to referee in 46 cases, ranging from 6 to 20 months (***Annexure 23)***, (ii) Delay in sending reminder to referee for submitting report in 11 cases ranging from 7 to 50 months (***Annexure 24)*** and (iii) Delay in sending reminders to the author for revision in 16 cases ranging from 8 to 50 months (***Annexure 25***).

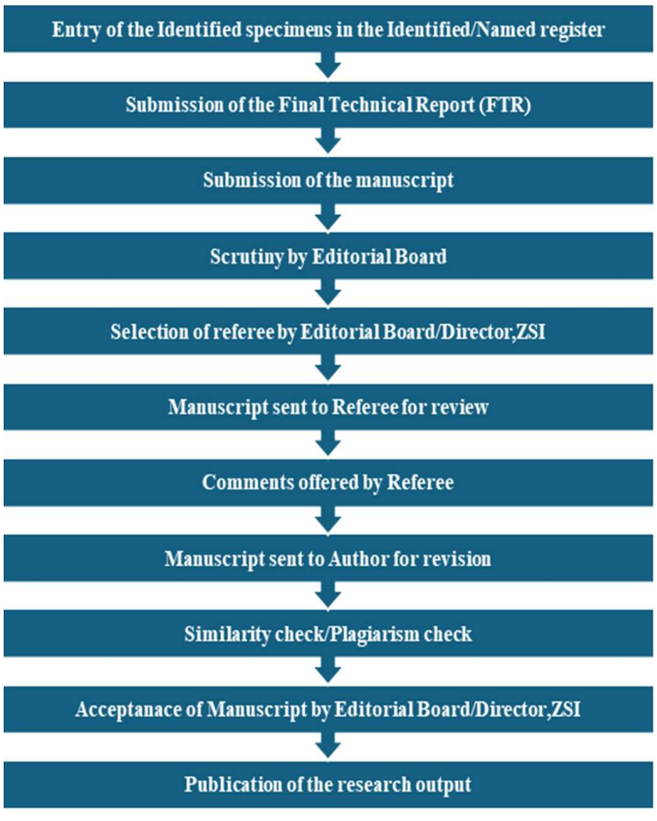

Figure 5: Activities in ZSI from receipt of manuscript in Publication Division

While accepting the observation, ZSI informed (December 2023) that necessary steps were being taken to rectify the position.

Ministry stated (October 2024) that the publications must follow an internal and external review process, which takes time as very few external reviewers are available in the country and they, as such, take long to review the publications sent to them due to the overload. It added that the process of publication is not entirely in the hands of ZSI and it is taking steps to expedite the process as much as possible. It further added that January 2024 onwards, 14 manuscripts have been published and eight are in the press, while 37 are pending with reviewers and 61 are with authors for incorporating the reviewers' comments. Also, reminders have been sent to both the reviewers and the authors for speeding up the process of publication.

Thus, lack of rigour in monitoring of publication process by ZSI, as well as non-adherence to the standard norms of publication, resulted in large number of manuscripts languishing

in the Publication Division awaiting final publication. This is also detrimental to ZSI performing its core mandate of contributing to the scientific knowledge on Indian Zoology and taxonomy.

Recommendation 8:

Zoological Survey of India may review its performance vis-à-vis the Strategic Plan and intensify its efforts towards completion of Surveys and publication of its work as per a time bound action plan. MoEF&CC may closely monitor the functioning of ZSI to ensure that it delivers on its commitments.

5.1.2.1(c) Absence of standard methodologies for conducting survey (Para 6.1.2.1 (ii) of Report No. 27 of 2014)

This deficiency was reported by Audit in 2014 and the Ministry assured (Aug 2016) in their Action Taken Note that Survey Manual would be brought out by March 2017. However, the Manual is yet to be published.

Ministry stated (October 2024) that presently, there is a Standard Methodology Manual which has been reviewed internally by the experts. It further added that the comments of the reviewers were being incorporated to make it a standard manual, comprising of best standards across the world and the Manual is expected to be published in the current financial year.

Thus, ZSI could not bring out Survey Manual even after a lapse of over seven years of the assurance given by the Ministry.

5.1.2.2 Monitoring of faunal diversity

Monitoring is regarded as scrutiny of trend of changes, if any, in the faunal assemblage and behaviour of the place under consideration, over the years. According to Article 7 of Convention on Biological Diversity, the objective of monitoring of faunal diversity was to monitor, through sampling and other techniques, the components of biological diversity identified, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use as well as to identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity and to monitor their effects.

i. Non-monitoring of Coral Reef Ecosystems

Coral reefs are one of the most ancient and dynamic ecosystems of India and it plays a key role in protecting the coastline from erosion, besides supporting various marine life. Coral reefs

are also important breeding, spawning, nesting and feeding grounds for many economically important varieties of fish and other marine organisms. India is centrally placed within the warm tropical region of the Indian Ocean and exhibits extensive coral reefs throughout its marine territories. The major reef formations in India are found in the Gulf of Mannar, Gulf of Kutch, the Andaman and Nicobar Islands and the Lakshadweep Islands.

With the strategic goal to reduce the direct pressures on biodiversity and promote sustainable use, 20 Aichi Biodiversity targets[31] were established by the Convention on Biological Diversity to address and mitigate biodiversity loss across the globe. Aichi Biodiversity Target 10 was set with regard to minimising the anthropogenic pressures on coral reefs and other vulnerable ecosystems impacted by climate change or ocean acidification. Further, corals are an endangered marine species and protected under Schedule-I of Wildlife Protection Act, 1972.

Aichi Biodiversity Target 10:

By 2015, the multiple anthropogenic pressures on coral reefs and other vulnerable ecosystems impacted by climate change or ocean acidification are minimised, so as to maintain their integrity and functioning.

As per Para 6.1.2.1 (iii) of Report No. 27 of 2014, a project titled 'Survey and monitoring of health of Coral Reefs in India' was sanctioned by MoEF (February 2002) at a cost of ₹1.27 crore for a period of five years to be implemented by Andaman and Nicobar Research Centre, Port Blair (ANRC)[32] for monitoring of corals at Andaman and Nicobar Islands, Lakshadweep, Gulf of Mannar, Gulf of Kutch and other reef patches along the east and west coast of India. Audit pointed out that, except Andaman and Nicobar Islands, no work was undertaken by ZSI for monitoring of Corals at other places. This project was also foreclosed in 2011 without achieving its objectives.

Ministry had replied (August 2016) in their Action Taken Note that for long-term monitoring of coral reef ecosystem of Lakshadweep, a MoU was signed by ZSI with the Government of Union Territory of Lakshadweep in 2015, for which recruitment of Project Staff and Fieldwork had already been initiated.

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[31] ***The Aichi biodiversity targets were established by the Convention on Biological Diversity which consist of 20 specific targets to address and mitigate biodiversity loss across the globe. These targets were adopted under 'Strategic Plan for Biodiversity 2011-2020', which is a 10-year framework for action by all countries and stakeholders to save biodiversity and enhance its benefits for people.***

[32] ***ANRC, Port Blair hosts a National Coral Reef Research Institute (NCRRI) in project mode since 2000 and the main objective of the Centre was to conduct survey and monitoring the coral reef of Andaman and Nicobar Islands, Lakshadweep, Gulf of Mannar, Gulf of Kutch and other reef patches along the east and west coast of India.***

In the present Audit, it was noted (November 2024) that monitoring of coral reef ecosystem of Lakshadweep is ongoing and scheduled to be completed in 2025. No work was undertaken in other sites, *viz.,* Gulf of Mannar, Gulf of Kutch, and other reef patches along the east and west coast of India. Further, ZSI has not maintained any periodic baseline data for monitoring of coral reef ecosystem.

Ministry stated (October 2024) that it is presently taking an initiative to set up biodiversity monitoring plots across the country, including Coral Reef Ecosystems, to understand the impact of climate change and its mitigation.

Recommendation 9:

Zoological Survey of India should prepare baseline data for monitoring the status of Coral reefs. Further, it should devise a timetable with frequent periodicity for survey to monitor the Coral Reef Ecosystem.

With regard to targets of monitoring of faunal diversity beyond March 2014, the following was noticed.

ii. Non-prevention of Invasive fauna

Invasive Alien Species are the species whose introduction and/or spread outside their natural habitats threaten biological diversity, negatively affecting the food, security, plant, animal and human health of a nation. Biological invasions by non-native species constitute one of the leading threats to natural ecosystems and biodiversity.

Aichi Biodiversity Target 9 was to introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species by 2020.

Aichi Biodiversity Target 9

By 2020, invasive alien species and pathways are identified and prioritised, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment.

For an effective invasive alien species research, prioritisation and management, certain specific data, including details of invasive species, pathways of invasion and also

the information about the sites that are most sensitive and prone for further invasion, is essential. ZSI, being the sole national organisation to ensure compliance with the commitments of Convention on Biological Diversity in the area of zoological survey, was therefore required to plan and undertake this activity. Vision Document (2000-2020) also emphasise prevention of introduction, proper surveillance for the invasive, apt control-eradication methods and preventing re-introduction are vital steps for the containment of Invasive Alien Species.

Audit observed that no pathway of intrusion of invasive fauna could be furnished by ZSI, though it had identified 61 invasive species up to 2022-23. Details are given in ***Annexure 26.*** Further, the year of identification has also not been provided by ZSI in 18 of the 61species identified.

Audit also observed that no specific research programme on invasive species was taken up by ZSI in the Annual Programme of Research during 2012-13 to 2023-24 except the Annual Programme of Research for the financial year 2015-16, wherein one Research programme titled 'Agro-ecosystems: Rice ecosystems of Kerala- Phase-I' focused on the study of various faunal groups including invasive alien species of the prominent rice ecosystem of Kerala.

ZSI informed (October 2022) that as an action plan towards the integration of studies on the invasive species, ZSI and Botanical Survey of India jointly organised the National Conference of Invasive Species in India in December 2017 and the recommendations emanating from the Conference had been sent to the Ministry for further action.

Ministry stated (October 2024) that it had taken up two research programmes on Invasive Species, namely (a) Invasive and pest white flies of Agro-Ecosystem of India and (b) Status and distribution of indigenous invasive alien freshwater fishes of Ramsar Sites of Tamil Nadu in the Annual Programme of Research 2024-25. The objective of these two programmes would cover the pathways of invasion and the most sensitive and prone site for further invasion. Further, it added that the issue of invasive fauna is a widespread problem and is taken up invariably every year, as and when the threat perception is deemed significant. The Vision Document was a guidance document and did not really depict annual targets.

Audit is of the view that the target of the study of invasive alien species, as defined in Vision Document (2011-2020), was not followed while framing the Annual Programme of Research by ZSI. ZSI also could not furnish any record showing that recommendations of the National Conference were submitted to MoEF&CC. Further, the Ministry did not

provide any clarification for not taking up of programme for the detection of pathways of intrusion of invasive fauna in respect of any of the 61 species identified during the period 2018-19 to 2022-23.

Thus, ZSI did not take adequate initiatives, although invasive fauna is identified as one of the main direct drivers of biodiversity loss at the global level.

Recommendation 10:

Zoological Survey of India may prioritise studies and research to contribute to the prevention of further spread of the invasive fauna and the targets of the Vision Document may be included in the Annual Programme of Research.

5.1.2.3 Taxonomic studies of all faunal components

One of the primary objectives of ZSI is to conduct taxonomic[33] studies of all faunal components collected. Also, the health of ecosystems could not be monitored without recognising the presence of individual organisms that are crucial for indication of ecological processes.

In Para 6.1.2.2 of the Audit report No. 27 of 2014 regarding shortfall in taxonomic description of animal specimens due to gaps in capacity building of taxonomist, Audit had recommended that ZSI should review its taxonomic needs and capacities at national, sub-regional and regional levels as envisaged in the Convention on Biological Diversity and make efforts to create sufficient capacities to overcome constraints and clear the backlog in taxonomic identification of species. The Ministry replied in their Action Taken Note in 2016 that action has been initiated to revive 21 posts of Assistant Zoologist and for 40 posts of Scientist (20 posts of Scientist-C, 17 posts of Scientist-D and three posts of Scientist-E), recruitment was under process.

In the present Audit, it was observed that a proposal for revival of 38 posts in the grade of Assistant Zoologist had been taken up by ZSI with the Administrative Ministry. A total of 17 vacancies[34] were revived with the approval of the Department of Expenditure in May 2023 but DoE did not agree to revive 21 posts. Further, ZSI recruited scientists in various posts during 2017 to 2024. As a result of which, number of taxonomists working in ZSI during 2018-19 to 2022-23 increased when compared to number of taxonomists working during the period 2005-06 to 2011-12 (ranging from 50 to 61 *per cent*) and ranged between 76 to 86 *per cent* of the sanctioned strength which appears reasonable ***(Table 16)***.

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[33] ***Taxonomy is the science of naming, describing and classifying organisms.***

[34] ***Six vacancies were advertised vide UPSC's Advertisement No. 01/2024 for filling up by direct recruitment and 11 vacancies had been filled up by promotion.***

Table 16: Availability of taxonomists

As on date	Sanctioned Strength of taxonomists	Number of taxonomists available	Percentage of availability of taxonomists
1.4.2019	136	106	78 *per cent*
1.4.2020	136	117	86 *per cent*
1.4.2021	136	113	83 *per cent*
1.4.2022	136	106	78 *per cent*
1.4.2023	136	103	76 *per cent*

Despite failure to revive the 21 posts of scientists, the number of taxonomists has increased due to recruitment.

In current Audit, some irregularities were observed related to the work of taxonomic identification of the specimens, which were collected during exploration/survey, as discussed below.

i. Huge backlog in taxonomic study of specimens

In the year 2018-19, ZSI had an opening balance of 18,35,835 specimens. During 2018-19 to 2022-23, ZSI collected another pool of 5,99,222 ***(Table 17)***. Audit, however, observed that so far ZSI was able to taxonomically identify 5,72,080 specimens out of the total 24,35,057 specimens, which was 23 *per cent* of the total specimens collected. The percentage of identification of specimens ranged from 8.29 *per cent* at North-Eastern Regional Centre, Shillong, to 49.44 *per cent* at Freshwater Biology Regional Centre, Hyderabad.

Table 17: Status of taxonomic identification

Headquarters/ Regional Centres	O.B. Unidentified	Addition	Total un-identified	Identified	C.B. Unidentified	Percentage of identification
	(1)	**(2)**	**(3) = (1)+(2)**	**(4)**	**(5) = (3)-(4)**	**(6)**
FBRC[35], Hyderabad	25,588	88,956	1,14,544	56,627	57,917	49.44
ANRC[36], Port Blair	47,819	78,362	1,26,181	48,691	77,490	38.59
CZRC[37], Jabalpur	62,280	16,612	78,892	11,163	67,729	14.15
DRC[38], Jodhpur	3,98,036	27,238	4,25,274	50,569	3,74,705	11.89
MBRC[39], Chennai	17,365	12,772	30,137	9,903	20,234	32.86
NERC[40], Shillong	1,61,943	18,891	1,80,834	15,000	1,65,834	8.29

[35] ***Freshwater Biology Regional Centre.***
[36] ***Andaman and Nicobar Regional Centre.***
[37] ***Central Zone Regional Centre.***
[38] ***Desert Regional Centre.***
[39] ***Marine Biology Regional Centre.***
[40] ***North-Eastern Regional Centre.***

Headquarters/ Regional Centres	O.B. Unidentified	Addition	Total un-identified	Identified	C.B. Unidentified	Percentage of identification
	(1)	(2)	(3) = (1)+(2)	(4)	(5) = (3)-(4)	(6)
NRC[41], Dehradun	90,377	11,176	1,01,553	13,314	88,239	13.11
SRC[42], Chennai	2,42,754	45,658	2,88,412	30,246	2,58,166	10.49
WRC[43], Pune	93,659	28,395	1,22,054	25,239	96,815	20.68
Headquarters	6,96,014	2,71,162	9,67,176	3,58,942	6,08,234	32.19
Total	**18,35,835**	**5,99,222**	**24,35,057**	**5,72,080**	**18,15,363**	**23.49**

Ministry stated (October 2024) that shortage of expertise to identify diverse faunal groups is a global challenge in biodiversity rich countries like India. This is known as Linnaean Shortfall and is well acknowledged as one of the major bottlenecks in biodiversity research. It further added that though the posts of scientists in ZSI might be full but unless there are scientists who have expertise in the particular taxa, the identification could not be done and faunal groups could not be studied by any scientist but a scientist who is a specialist in the identification of a particular taxa. Ministry concluded that the data regarding vacancy and shortfall is not valid as it did not show a shortage of expertise in particular taxa.

The reply of the Ministry does not explain the reasons for not acting upon the PAC's recommendation to strengthen capacity at multiple levels and the actual issue of not establishing a sustainable capacity-building framework to clear the backlog in species identification.

Recommendation 11:

ZSI may establish a structured capacity building framework by creating a pool of taxonomic experts drawn from universities, research institutions and retired specialists at national and regional levels and by encouraging universities/institutions in promoting courses and specialization in this field of study, to address subject-specific gaps in availability of trained manpower.

ii. Mismatch in the number of specimens sent from the Regional Centre and received by Headquarters

Some specimens that were collected but could not be identified due to the absence of subject experts were sent to Headquarters by Andaman and Nicobar Regional Centre, Port Blair, Southern Regional Centre, Chennai, Freshwater Biology Regional Centre, Hyderabad, Desert Regional Centre, Jodhpur and North-Eastern Regional Centre, Shillong for taxonomic identification. Scrutiny revealed that the specimens sent by the Regional Centres were

[41] *Northern Regional Centre.*
[42] *Southern Regional Centre.*
[43] *Western Regional Centre.*

different from the specimens received by the Headquarters. As per the record of Headquarters Kolkata, not only did the number of specimens vary, but also, in some cases, the animal groups to which the specimens pertain did not match the records of Regional Centres. As a result, a considerable number of specimens remained untraceable as of October 2024. Details of the same are given in ***Annexure 27***.

Ministry accepted the Audit observation and stated (October 2024) that a circular has been issued (September 2024) to all Regional Centres as well as all sections to strictly follow the procedures for sending the specimens to Headquarters, Kolkata, for identification in order to avoid mismatch in numbers.

The reply indicates that ZSI does not have strict and robust internal control of the operations carried out, due to which management of the valuable faunal collections is dealt with in an indifferent manner.

iii. Non-establishment of cyber taxonomy units

One of the goals of the action plan 'Vision 2020' was to introduce and integrate cyber taxonomy[44] at ZSI to disseminate taxonomic information with regard to Indian fauna at a rapid pace in a more efficient way. The proposed action plan was to establish Cyber taxonomy units at selected Centres of ZSI by 2012, to assist the taxonomists in developing digital taxonomy products. The units were to have their own infrastructure including advanced computer systems with accessories and also high quality, advanced microscopes for digital imaging. Audit observed that although the goal was to set up cyber taxonomy units at ZSI by 2012, no cyber taxonomy units could be set up at ZSI till date of Audit (October 2024).

ZSI stated (December 2023) that cyber taxonomy was implemented to a limited extent. However, it needs to have IT cell to develop a software for cyber taxonomic works. Presently, ZSI was in the process of setting up IT cell.

While the immediate cause for non-establishment of cyber taxonomy is attributed to delay in setting up of IT cell, despite setting up of cyber taxonomy units being one of the goals of Vision 2020 in 2011, the deeper issue is the overall lack of commitment to deliver on the goals articulated in the Vision Document.

5.1.2.4 Survey of threatened and endemic species

A primary objective of ZSI was to conduct periodical status surveys on species which have been identified as endangered. The status survey is undertaken in order to ascertain the status of

[44] ***Cyber enabled taxonomy or Cyber taxonomy utilises standardised electronic tools to access information and generate knowledge bases, integrating the best of the information technology into the taxonomic processes.***

a particular animal in terms of whether it is extinct, endangered, threatened or stable. Periodic reviews of the conservation status of those species are also conducted by ZSI to determine whether the status of the species warrants its current listing status or deserves reclassification. Subsequently, ZSI shares the conservation status of the species with concerned authorities to enable them to take measures towards the conservation of species of interest.

i. Non-dissemination of results of surveys undertaken through research programmes

Para 6.1.2.3 of Report No. 27 of 2014 regarding status survey of endangered and threatened species highlighted that against the target of 10 species, status survey was not initiated on seven species and in respect of the remaining three species, though survey was undertaken, publication was brought out for only one species as of March 2014.

The progress of pending work was examined during the present Audit and it was noted that of the pending nine cases above, publication was done in respect of six species with delays ranging from 5 and 12 years. The remaining three cases[45] were unpublished despite delays ranging from 10 to 14 years. Detailed status is given in ***Annexure 28***.

In respect of pending three cases, ZSI stated (November 2024) that in two species (Coral reefs of Nicobar Islands and Indian Wild Ass), the authors had not submitted manuscript in the Publication Division for printing. In case of Swamp Deer, though the manuscript was submitted on 12 April 2019 but publication is still pending and would be published in 2025.

The reply of ZSI needs to be viewed in the context that periodical review of status of threatened and endemic species was a mandate of ZSI. However, ZSI failed to bring out publication of three targeted endangered and threatened species even after a lapse of 10 years of audit pointing it out and assurances to PAC. As a consequence, the conservation status of species was not shared with authorities concerned, in order for them to pay attention to those species and undertake urgent conservation measures as required.

Subsequently, ZSI conducted 25 status surveys under the regular research programmes during the last 11 years (2011-12 to 2021-22). Out of these, publication was brought out only in nine cases and no publication was done in 13 cases. In remaining three cases, no data was furnished by ZSI. ***(Annexure 29).*** Thus, ZSI did not share the conservation status of the species with authorities concerned.

Ministry stated (October 2024) that publications are not the only forms of dissemination of results of surveys undertaken through research programmes by ZSI, but the results are also disseminated by means of conducting capacity building training programmes,

[45] ***Coral Reef (Nicobar Island), Indian Wild Ass and Swamp Deer.***

high-end workshops, theme-based workshops, delivering lectures to stakeholders, popular articles, monthly e-newsletters through social, electronic and print media and organising workshops and trainings through Environmental Information Awareness Capacity Building and Livelihood Programme centres. It added that the publications pertaining to status surveys/fauna of protected areas conducted by ZSI have been regularly sent to the respective State Forest Departments for development of policies and management towards the conservation of the species concerned.

Thus, in contravention of Article 7 of Convention on Biological Diversity, the objective of monitoring and scientific documentation of faunal diversity with regard to species requiring urgent conservation measures or which are at the verge of extinction was not met by ZSI.

Recommendation 12:

Zoological Survey of India may make efforts to achieve the targets relating to the status survey of threatened and endemic species and publication of the research outcome and review them periodically.

5.1.3 Effectiveness of extended scientific activities under secondary objectives

5.1.3.1 Maintenance and development of National Zoological Collection

The National Zoological Collection maintains specimens of fauna collected through various surveys of the organisation since its inception in 1916. In addition to this, National Zoological Collection also maintains legacy collections obtained from institutions such as Asiatic Society, Indian Museum and other international museums. Over 40,000 type specimens[46] of Indian fauna are housed in the National Zoological Collection in the ZSI Headquarters at Kolkata and its sixteen Regional Centres. The mandate of National Zoological Collection is to maintain authenticated specimens of Indian fauna and disseminate information on them to scientific community, policy makers and public through print and electronic media.

Figure 6: Historical biological collections at Headquarters

The National Zoological Collection is also a designated repository under Section 39 of Biological Diversity Act (2002) for Access and Benefit Sharing. Under this, specimens are deposited in National Zoological Collection at Kolkata.

[46] ***A type specimen is a specimen selected to serve as a reference point when a species is found for the first time. As a result, these specimens are extremely important to taxonomist who are attempting to determine the correct application of a name.***

As per sub-section (2) of Section 39 of the Biological Diversity Act, 2002, the repositories shall keep in safe custody the biological material including voucher specimens[47] deposited with them. This involves the preservation and maintenance as well as augmentation of the National Zoological Collections on regular basis. However, ZSI did not have any recorded evidence pertaining to safe custody of specimens. There was also no system at ZSI Headquarters and in some of the Regional Centres, *i.e.,* North Eastern Regional Centre Shillong, Marine Biology Regional Centre Chennai Andaman and Nicobar Regional Centre Port Blair to protect the collection against any untoward/unforeseen situation like fire, flood, theft, *etc.* One incident of fire happened in Desert Regional Centre Jodhpur in April 2021, however no loss of specimen/repository items was reported in that incident.

The Ministry agreed with the fact and stated (October 2024) that ZSI would approach the Central Construction Unit to submit the preliminary estimate for disaster preparedness in repositories, museums and galleries to safeguard the collections.

Recommendation 13:

Zoological Survey of India should ensure disaster preparedness in the repositories, museums, galleries housing the collections and formulate plans to prevent, respond and recover from natural disasters and other events that can cause damage or loss to the biological properties at the earliest.

i. Non-conducting of physical verification of specimens

ZSI in August 2013 had ordered for submission of physical verification reports in respect of Regional Centres and divisions of Headquarters within six months. Audit observed that it could not be completed even after 10 years. Again, in October 2023, ZSI issued orders to its Regional Centres and Headquarters' divisions to submit the physical verification report by April 2024. Out of nine selected regional centres, two centres stated that physical verification was not done, two centres stated that physical verification was restricted to the taxa where subject expertise was available, two centres had completed physical verification in April 2022 and in March 2023 and in remaining three centres, physical verification was in progress. However, no reports were furnished by ZSI in this regard.

The Ministry stated (October 2024) that 70 *per cent* of the specimens had been verified physically and it was expected to be completed by December 2024.

[47] ***Any specimen other than the type specimen (as specified in footnote 46) is a Voucher/General specimen.***

ZSI further stated (November 2024) that physical verification of the specimens had been done long back but the reports are not readily available. It also stated that this is a continuous process and cannot be done as onetime exercise.

The facts remain that ZSI could not complete physical verification of the specimens of its collection even after a lapse ten years.

ii. Disposal of specimens without approved procedure

As per Conservation of Bio-Diversity Act (2002), biodiversity is the sovereign property of the concerned State. Hence, samples of biological materials belong to the State and repository is only custodian of the samples deposited. Thus, ZSI being the repository should have an approved policy/procedure for disposal of specimens under their control.

Audit, however, observed that there was no approved policy for the disposal of faunal specimens in the ZSI. Audit observed that out of the faunal specimens sent to ZSI Headquarters for identification from different Regional Centres and other organisations/ individuals, various specimens got damaged and were thrown away.

The Ministry while not offering any comments regarding approved policy/procedure for disposal of specimen stated (October 2024) that ZSI had not disposed of any of its collection and specimens received in Central Entomology Laboratory section for identification were immediately sent to the concerned experts. The statement in the Central Entomology Laboratory registers was written by some unruly staff in the section, to whom show-cause notice was issued.

However, the fact remains that ZSI did not have any approved policy/procedure for disposal of specimen.

Recommendation 14:

Zoological Survey of India may develop a policy for disposal of specimens under its custody.

iii. Non digitisation of faunal specimens

The National Zoological Collection of ZSI houses a vast range of faunal collection of the country ranging from Protozoa to Mammalia. The taxonomic research in India mainly rests on this National Zoological Collection and the specimen (Type as well as General Specimen)[48] of this collection are used as reference database for identification of any faunal specimen from any part of the country. The collection being old requires immediate

[48] ***A type specimen is a specimen selected to serve as a reference point when a species is found for the first time. All specimen other than type specimen are General or Voucher Specimen.***

preservation for future studies. Moreover, for perpetual records, digital documentation of this collection becomes absolutely necessary.

ZSI submitted a proposal for a project on Digitisation of Faunal Type Specimens in April 2014 and MoEF&CC had approved the same in December 2014. Subsequently, ZSI entered into an agreement with an agency for digitisation of 12,500 samples of Type Specimens, in June 2015, at a contract value of ₹2.82 crore. The project was to be completed within 365 days from the day of signing the contract. No further agreement was entered by ZSI for digitising the Type Specimens thereafter. Also, ZSI signed an agreement with the same firm for a work on 'Photographic Digitisation of the Faunal General Specimens and Existing Raw Image' for digitising the General Specimens on 13 June 2022 for a period of five years from the date of signing of the contract.

iv. **Slow progress of digitisation of faunal specimens**: Audit observed (August 2023) that out of 57,93,877 specimens (41,606 Type Specimens and 57,52,271 General Specimens) under the possession of ZSI as on 31 March 2023, digitised images of 16,320 specimens (12,500 Type Specimens (30 *per cent*) and 3,820 General Specimens (0.06 *per cent*)) had been uploaded on the portal of virtual National Zoological Collection[49].

Irregularities in metadata: Digitisation of the specimens included the details of national zoological collections with all metadata. The metadata contained 42 fields which included 13 mandatory fields. Random selection and test check of such uploaded files during audit revealed irregularities in the digitised specimens uploaded on the virtual portal. Random selection and test check of 1,730 cases revealed that all 13 mandatory fields were filled in with regard to only 35 cases. While Field 'Type' was not mentioned in 191 cases, Locality Name/State-UT/ Country name was not mentioned in 643 cases, Collector's Name was not mentioned in 712 cases, Authorship was not mentioned in 761 cases and Collection Year was not mentioned in 1,220 cases.

Audit also noted that ZSI did not plan to create any master table in respect of the fields related to the names of the countries, names of the states, names of the districts, genus, list of sections/ divisions/regional centres, names of families, *etc.,* resulting in following discrepancies.

- In the field named 'Country', 'Chaina', 'Hongkog', 'Malay', 'Malay State', 'eastern India', ''Central India', 'Southern India', 'Inda', 'Indaia', 'Pakisthan', 'Singhapore', 'Uncertain', 'Foreign', 'Ditto', *etc.,* were entered.

[49] ***ZSI has created a web portal on Virtual National Zoological Collections, which is a digital archive on the collection holding of Headquarters and Regional Centers. The archive provides information on Type and other specimens held in National Zoological Collection to different stakeholders and general public (zsicollections.in).***

- In the field related to gender of the species, there was no uniformity in the data. For example, '♂ and ♀', '♂, ♀', '♂;♀', 'F, M', *etc.,* was entered for showing Hermaphrodite[50] types of species.

ZSI stated (December 2023) that as the digitisation of specimen is associated with huge monetary involvement, it is not possible for ZSI to digitise all the specimens with the existing annual budget. Therefore, ZSI had proposed in the 18th meeting of the Research Advisory and Monitoring Committee in 2023 for recommendation of a special grant of ₹5 crore from the Administrative Ministry to digitise 5,000 specimens of National Zoological Collection for next three years to speed up the existing digitisation work with utmost priority. ZSI further stated (November 2024) that digitisation of faunal specimens was under progress. A total of 76,272 digitised images had been uploaded to the ZSI collection website. It added that sanction of ₹5 crore from the Administrative Ministry to digitise 5,000 specimens of National Zoological Collection for next three years is yet to be received.

The Ministry reiterated (October 2024) that as soon as the fund would be received by ZSI, the process of digitisation would speed up.

The fact remains that a detailed road map backed by financial commitment for complete and effective migration to digital preservation of faunal specimens is yet to be formulated.

Recommendation 15:

Zoological Survey of India may prioritise clearing the huge backlog of digitisation of specimens and take corrective action to compile the data base without errors.

v. Mismatch of figures pertaining to National Zoological Collection

Audit observed that ZSI does not have an authentic database of its faunal collections (Named/ Identified as well as Unnamed/Unidentified) with National Zoological Collections housed at its Headquarters in Kolkata and 16 Regional Centers. At different times, ZSI furnished different collections data with its National Zoological Collection collections pertaining to the same period. In many cases, the cumulative figures of identified (named) and unidentified (unnamed) faunal specimens at the end of a particular year were less than that at the end of earlier year(s). Further, Audit found that in many cases, data of identified/unidentified specimens of holding of National Zoological Collection of Regional Centres pertaining to a particular period, as furnished by the respective Regional Centres and as furnished by

[50] ***Sexually reproducing organism that produces both male and female gametes.***

ZSI Headquarters was different. Moreover, in many cases, the opening balance of unnamed specimens at the beginning of a particular year was more/less than the closing balance of the previous year. Few such cases are discussed below.

(a) Figures of Named/Identified specimens

The number of named specimens, of National Zoological Collection at ZSI Headquarters, Kolkata and its Regional Centres, submitted by ZSI to MoEF&CC in December 2013 in its proposal for digitisation of Faunal Type Specimens, was less than the number of named specimens which was earlier submitted by ZSI in its draft Memorandum for Expenditure Finance Committee (EFC) for 12th Five Year Plan period (2012-2017), duly signed by Director, ZSI on 15 November 2012. The details of such an increase and decrease in named specimens are shown in ***Table 18.***

Table 18: Difference in figures of named specimens of Headquarters and Regional Centres

Sl. No.	Name of HQ/Regional Centres	Number of identified/named specimens		Difference in number of specimens ('+'/'-')
		As on Nov 2012	As on Dec 2013	
1	Headquarters, Kolkata	16,09,224	2,50,000	**More than 13 lakh (81%)**
2	ANRC, Port Blair	22,612	21,883	**729 (3.2%)**
3	FBRC, Hyderabad	11,581	2,198	**9,383 (81%)**
4	HARC, Solan	24,514	22,943	**1,571 (6%)**
5	MBRC, Chennai	1,11,771	1,09,935	**1,836 (2%)**
6	NRC, Dehradun	1,85,701	1,55,225	**30,476 (16%)**
7	SRC, Chennai	1,60,676	1,18,940	**41,736 (26%)**
8	WGRC, Calicut	20,442	19,094	**1,348 (7%)**
9	WRC, Pune	36,355	32,492	**3,863 (11%)**

(b) Figures of Unnamed/Unidentified specimens

(i) During present Audit, ZSI Headquarters furnished (October 2022) the year wise (a) opening balance of unnamed specimens, (b) collection during the year, (c) identification during the year and (d) closing balance of unnamed specimens for different periods in respect of ZSI Headquarters and two of its Regional Centres, separately. There were significant differences between those figures and the figures furnished by Sunderban Regional Centre, Canning, Headquarters, Kolkata and Estuarine Biology Regional Centre, Gopalpur-on-sea Centre, as compared to that provided by ZSI Headquarters, the details of which have been shown in ***Annexure 30***.

(ii) During audit of four Regional Centres (Fresh water Biology Regional Centre, Hyderabad, Western Regional Centre, Pune, Desert Regional Centre, Jodhpur and Central Zone Regional Centre, Jabalpur) in July 2023, the respective Centres furnished the figures of opening balances

and closing balances of unnamed/unidentified specimens at the beginning of 2018-19 and the end of 2021-22. However, there was a significant difference between the figures furnished by the respective Centres and those furnished by ZSI Headquarters, Kolkata ***(Annexure 31).***

While accepting the facts, the Ministry stated (October 2024) that physical verification of the specimens was in progress and correct figures would be reflected after completion of verification in December 2024.

Recommendation 16:

Zoological Survey of India may ensure regular physical verification of specimens.

5.1.3.2 Chromosomal mapping and DNA fingerprinting

To halt the erosion of biodiversity, a global biomonitoring system was proposed under the Convention on Biological Diversity's mandate to track the shifts in abundance and distribution of all species through DNA sequencing and Barcoding. The DNA Barcode workflow begins with the collection of specimens, followed by DNA extraction and its subsequent sequence analysis. Information on the specimen and its barcode sequence is then deposited in the Barcode of Life Data System (BOLD)/GenBank, an informatics platform developed for this purpose. The DNA barcode reference library on the Barcode of Life Data system enables anyone to rapidly ascertain the identity of newly encountered specimens. ZSI has also committed to barcoding all the Indian faunal species through the DNA molecular tool.

As per the recommendations and approval of Research Advisory and Monitoring Committee Meeting held in September 2012, a Centre for DNA Taxonomy under Molecular Systematics Division at the ZSI Headquarters (coordinating Centre) and four DNA Barcoding Labs at Regional Centres of ZSI (Pune, Dehradun, Hyderabad and Chennai) were established to generate DNA barcode sequences of Indian fauna. Guidelines for DNA Barcoding initiatives had, *inter alia*, specified some priority areas[51] for DNA Barcoding and also instructed the Regional Centres to strictly adhere to priority areas for DNA Barcoding work.

[51] ***1. DNA Barcoding of Type specimens (Holotype, Paratype, Synctypes, etc.) housed at ZSI HQ and other Regional Centres of ZSI, 2. DNA Barcoding of Animal species listed in the Schedules of Wildlife (Protection) Act, 1972 housed at ZSI HQ and other Regional Centres of ZSI. 3. DNA Barcoding of Convention on International Trade in Endanger Species listed Indian species housed at ZSI HQ and other Regional Centres of ZSI. 4. DNA Barcoding of endemic species housed at ZSI HQ and other Regional Centres of ZSI. 5. DNA Barcoding of species with Medical, Forensic and Veterinary importance, 6. DNA barcoding of lesser-known Animal Taxa, 7. New description of species to be coupled with DNA barcodes, 8. Other groups/species shall be DNA barcoded only with externally supported projects, 9. Collecting and sending fresh tissue samples/preserved samples to the Centre for DNA taxonomy (CDT) as and when it is available and 10. Survey tours to Pas, Ecosystems, etc., may be coupled with collection of fresh samples for barcode as per the priorities.***

Audit observed that-

- Out of 3,983 Type Specimens at the disposal of selected nine Regional Centres, only 36 (0.90 *per cent*) Type Specimens could be barcoded at Freshwater Biology Regional Centre, Hyderabad and Western Regional Centre, Pune.
- Of the 17,24,756 general specimens at nine selected Regional Centres, only 5,250 barcodes (0.30 *per cent*) have been generated.
- ZSI Headquarters generated 6,275 barcodes out 32,40,178 specimens with it. Further, ZSI, Headquarters had not classified any priority areas for Barcoding.

While accepting the observation, ZSI stated (December 2023) that it would expedite the sequencing and increase submissions to BOLD/Genbank. ZSI further added that Regional Centres like DRC, CZRC, NERC and MBRC were not equipped with DNA barcoding facilities, due to which these Regional Centres had not generated any barcodes. Also, most of the Type Specimens were older than 50 years and DNA analysis from such specimens required a dedicated state-of-the-art facility to process the low copy samples. ZSI intimated that most of the sequencing was outsourced in the last two years due to malfunction of its in-house DNA sequencer.

The reply of ZSI may be viewed in light of the fact that as per extant guidelines, Regional Centres which were not equipped with a dedicated facility for DNA sequencing would have to send the samples to CDT at ZSI Headquarters for further processing which was not done by these Regional Centres. Regarding barcoding in priority areas, though ZSI claimed that most of the Type Specimens were very old, which required a dedicated state-of-the-art facility for processing, ZSI did not take any initiative to create such a facility. Further, ZSI remained silent regarding low levels of barcoding in the remaining priority areas.

The Ministry stated (October 2024) that DNA Barcoding was a complex process. Due to shortage of manpower having expertise in the field, along with shortage of recurring fund availability, the work was delayed. Further, the instruments/equipment used were outdated and their efficiency became low. It added that ZSI submitted a proposal (August 2022) to upgrade the instruments to increase the efficiency of barcoding work.

The reply of the Ministry may be viewed in light of the fact that despite slow pace of barcoding made by ZSI, it had not issued any directions to ZSI to accelerate the same.

Recommendation 17:

Ministry may take urgent action on the proposal of ZSI to upgrade the infrastructure so that all Regional Centres are adequately equipped for barcoding work and efficiency of the barcoding work can be increased.

5.1.3.3 Non-establishment of Geographical Information System and Remote Sensing Laboratory

One of the goals of the action framework 'Vision 2020' was to establish a Geographical Information System (GIS) and Remote Sensing Cell in ZSI to facilitate incorporating GIS and remote sensing techniques in regular faunal surveys of the department, so that the end results of the surveys are more informative and user friendly to the policy makers. In Vision 2020, ZSI had proposed to establish and develop a Cell for GIS and remote sensing by 2015 for collection and analysis of data and to supplement it with that data which was collected on the ground for bringing out an integrated picture of faunal diversity of various ecosystems.

However, Audit scrutiny revealed that the proposal for establishment of Geographic Information System and Remote Sensing laboratory was submitted to the Ministry only in August 2021. Ministry raised (September 2021) a few observations with regard to the proposal and instructed ZSI to obtain the data on the forest cover types, census data, soil types, *etc.,* beforehand and to include the data on floral species from the Botanical Survey of India, which may serve as a base for conservation strategy. Ministry also directed ZSI to come up with framework where the expertise of different organisations is leveraged as ZSI has only the domain knowledge of survey. Thus, in the Ministry's view, this aspect could best be handled by experts in relevant fields as ZSI does not have the expertise in sizing up the hardware and its management, portal management as also GIS. Ministry further ordered to place a revised proposal and to incorporate therein the extent to which the information/ database can be utilised in real terms.

ZSI intimated (October 2022) that submission of the revised proposal to the Ministry is still awaited due to reasons such as ZSI inability to obtain the desired data from the concerned organisations, such as Forest Survey of India, Wildlife Institute of India, National Remote Sensing Centre, *etc.,* due to non-availability of budget to procure the data. ZSI further added that it is hard for ZSI to coordinate with organisations without a proper MoU at the Ministry level because the 100-year data has been collected with so much effort and this invaluable data cannot be shared with other organisations and hence it was impossible to leverage the expertise of other agencies.

ZSI delayed the submission of proposal for establishment of GIS and Remote Sensing lab to MoEF&CC by almost six years from the scheduled period. Further, after submission of the proposal, ZSI could not respond to the observations of the Ministry on the proposal from September 2021 to date. As a result, the goal of setting up the GIS and Remote Sensing lab could not be achieved.

The Ministry stated (October 2024) that ZSI had significant domain knowledge in faunal surveys and needed the collaborative utilisation of external expertise in GIS and Remote

sensing. Establishing MoUs was critical for ensuring data integrity and confidentiality. It further added that ZSI was able to maintain good publications and successfully managed multiple projects involving GIS analysis with the existing GIS and remote sensing facilities. It would remain committed to ongoing professional development in this field without such GIS laboratories.

The reply of the Ministry indicates that it has no commitment in taking help of modern developments in GIS and remote sensing, *etc.,* to achieve the goal of the action framework 'Vision 2020' as well as to ensure that ZSI works using modern technology.

Recommendation 18:

Ministry may take appropriate action in signing MoU with other Departments so that the process of establishment of GIS and Remote sensing lab may be completed in a time bound manner.

5.1.4 Conclusion

Zoological Survey of India is a critical organisation in India's efforts towards conservation and documentation of faunal biodiversity in the country. Its revised mandate was targeted to deliver on the goals of CBD, through its redefined objectives relating to exploration, survey, inventorisation and monitoring of faunal diversity and their documentation. Its Strategic Plan, which spanned a period of 20 years beginning 2001, focused on efforts toward conservation of faunal biodiversity.

The activities of ZSI in fulfilling the revised mandate were poorly executed. There were delays ranging from 1 to 16 years in conducting the surveys and publishing research findings. Though it was pointed out in previous audit, the Zoological Survey of India could not develop standard methodology for conducting surveys and bring out survey manual even after lapse of over seven years since the assurance was given by the Ministry (2017). This not only impacted the implementation of the objectives of Conservation of Biodiversity in the area of conservation of faunal species but also jeopardised the role of ZSI in contributing to the scientific knowledge on Indian Zoology and taxonomic knowledge.

Species wise and area wise monitoring of faunal diversity was not prepared, including the required baseline data for monitoring of status of coral reefs, which are high risk life forms. The Institute, in contravention of the Convention on Biological Diversity and Sustainable Development Goals, did not make any effort of note for managing, controlling and eradicating invasive alien fauna, which increased the inherent risk of further spread. ZSI, as a result of inadequacies of its recruitment process and non-hiring of external

experts, could not build capacity in terms of trained manpower for carrying out Taxonomic studies. Consequently, ZSI could not identify 77 *per cent* of specimens collected during the last five years.

Further, basic infrastructure to protect the collected specimen against any unforeseen situation like fire, flood, theft or any other natural disaster was absent. No policy/procedure was followed for disposal of specimens. Slow pace of digitisation of invaluable specimen data, along with incomplete metadata, hindered preservation of old records in perpetual/digital mode of documentation for future studies. Absence of physical verification of collected specimens in National Zoological Collection resulted in mismatch of figures in named and unnamed species among the collection. Non-upgradation of instruments to increase efficiency of ZSI for the barcoding work and non-establishment of Geographical Information System and Remote Sensing Laboratory due to lack of commitment to the purpose of both ZSI and the Ministry were detrimental to the fulfilment of targets assigned to ZSI.

Thus, ZSI was lagging behind in meeting its targets oriented towards fulfilling the country's commitments under the Convention on Biological Diversity. The pace of work was slow and not commensurate with the volume of the work involved.

CHAPTER VI

Department of Science and Technology

6.1 Non-utilisation of Clean Room constructed at a cost of ₹0.66 crore

Due to improper planning, a Clean Room facility created at a cost of ₹0.66 crore for scientific research purposes by Bose Institute remained unutilised for more than five years.

Bose Institute, Kolkata, is an autonomous R&D institute under the Department of Science and Technology (DST), Ministry of Science and Technology, Government of India. The Institute placed a purchase order in March 2018 for supply, installation and execution of the work for the preparation of 10,000 Class Clean Room for ₹0.72.crore with the scheduled date of completion as 120 days from the issue of the supply order. Clean Room was required for the fabrication of detector modules for Muon[52] Detection System to be used in the CBM[53] Experiment at FAIR[54], Germany and implemented on a turnkey basis and used for quality assurance and other activities for ALICE TPC upgrade project. The installation of 10,000 class clean room was successfully completed and handed over to the Bose Institute on 14 June 2019. The Institute paid an amount of ₹0.66 crore to the supplier for the work.

Audit observed that the Clean Room, though completed, remained completely unutilised. On being enquired about the non-utilisation of the Clean Room, Bose Institute stated (November 2023) that although the Clean Room was ready to be used as a facility, there were several other equipment which remained to be procured for the development and testing of the modules. The Institute also stated that indents were placed for those items in September 2019, but the procurement of those items had not been completed. It was also noticed that the Institute floated a tender for six equipment in October 2020. Out of which only one item was procured. The Institute retendered in February 2021 for the rest of the items. However, the said tender could not be realised till now. Thus, it was observed that due to lack of required equipment, the work

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[52] ***The muon is part of the lepton group. Leptons are a type of fundamental particle. Muons are similar to electrons but weigh more than 207 times as much.***

[53] ***Compressed Baryonic Matter.***

[54] ***Facility for Anti Proton and Ion Research (FAIR) is an international facility under construction in Germany. India signed the Convention as a founder-member country to participate in the construction. The project would be managed by the FAIR Company (FAIR GmbH). Bose Institute had been designated as Indian shareholder in the FAIR project. One of the main responsibilities of the Institute was to develop and fabricate the Muon Chamber (MuCh) detector modules to be used in the CBM experiment. These are gas-based particle detectors used to detect high-energy muons from the experiment. Being gas-based detectors, they are required to be built in a temperature and humidity-controlled environment free from dust. The 10000-class clean room was required to be built so that the MuCh modules could be built and tested using this facility.***

of fabrication of detector modules could not be started yet. In the meantime, after six years, the DST sponsored project 'CBM MUCH' had been terminated on 31 July 2022.

In reply, the Department stated (September 2024) that the Compressed Baryonic Matter Muon Chamber Experiment was not a standalone project. Its timely completion was intertwined with the schedule of the FAIR. The detector modules, which were to be manufactured, were of such a transient nature that they could not be sustained for a long time. So, the experiments required immediate operation after the formation of the modules. Thus, the detector modules would be needed at a later stage. The Department further added that a proposal for an extension of the project was under consideration, hence the necessary procurement required for the fabrication of the Clean Room depended upon the extension of the project and the same would be resumed after the arrival of the funds.

The reply of the Department may be viewed in light of the fact that utilisation of the Clean Room after the extension of the project appears an afterthought, especially in view of the rapid advancement in technology which may lead to obsolescence. The Institute failed to plan adequately to complete the entire facility on time resulting in non-utilisation of the Clean Room.

Thus, the fabrication of detector modules for the Muon Detection System could not be initiated due to lack of proper planning by the Institute and the Clean Room constructed at a cost of ₹0.66 crore could not be utilised for the purpose for which it was procured.

CHAPTER VII

Department of Atomic Energy

7.1 Irregular grant of additional increments by various units of Nuclear Power Corporation of India Limited/Bhartiya Nabhikiya Vidyut Nigam Limited

Nuclear Power Corporation of India Limited/Bhartiya Nabhikiya Vidyut Nigam Limited granted additional increments to its employees irregularly from November 2013 to June 2017. This practice was discontinued from June 2017 (date of issue of instructions by the Department of Atomic Energy), instead of November 2013 which resulted in irregular payment amounting to ₹8.92 crore.

The Government of India approved (October 1998) the grant of two additional increments to the Scientists and Engineers of the Department of Atomic Energy, Department of Space and Defence Research and Development Organisation, with effect from 1 January 1996, on promotion to four pre-revised pay scales[55]. Units of Public Sector Enterprises[56] and Government Company[57] under the administrative control of the Department of Atomic Energy also extended these benefits to its scientists/engineers.

Subsequently, based on the recommendations of the Sixth Central Pay Commission, the Department of Atomic Energy and Department of Space introduced a new Performance based pecuniary benefit called Performance Related Incentive Scheme with effect from September 2008. Since Performance Related Incentive Scheme had been implemented, Ministry of Finance advised Department of Space in November 2013 to consider withdrawing the two additional increments granted to the employees of Department of Space immediately and prospectively. Since the grant of additional increments was extended to the Department of Atomic Energy/ Department of Space/Defence Research and Development Organisation through a single scheme, the advice of Ministry of Finance issued to Department of Space was applicable to all the Departments implementing the scheme.

Department of Atomic Energy issued instructions (June 2017) to discontinue the benefit of the two additional increments partially, *i.e.,* it stopped the grant of two additional increments for promotion from Scientist C to Scientist D alone with effect from that date. Subsequently, realising the disparity in implementation of Ministry of Finance advice in

[55] ***(a) Scientist C: ₹ 10000-15200; (b) Scientist D: ₹ 12000-16500; (c) Scientist E: ₹ 14300-18300; (d) Scientist F: ₹ 16400-20000.***

[56] ***Kudankulam Nuclear Power Project, Madras Atomic Power Station and Kakrapar Atomic Power Station.***

[57] ***Bhartiya Nabhikiya Vidyut Nigam Limited.***

Department of Atomic Energy and Department of Space, the Department of Atomic Energy consulted Member (Finance) of Atomic Energy Commission who advised to discontinue the scheme of providing two additional increments with immediate effect. Based on the advice obtained and to rectify the discrepancy, Department of Atomic Energy issued instructions (August 2020) for discontinuation of the scheme of two additional increments in its entirety with effect from 13 June 2017. Department of Atomic Energy also decided to recover the payments made from 13 June 2017 till August 2020 in convenient instalments and conveyed instructions to all its constituent units. Based on the above instructions of the Department of Atomic Energy, Nuclear Power Corporation of India Limited issued orders (August 2020), advising all its constituent units to implement the same with effect from August 2020.

Audit observed that the Department of Atomic Energy issued instructions for withdrawal of benefit of two additional increments after three-and-a-half years and made it effective from 13 June 2017 though Ministry of Finance had issued the advisory as early as in November 2013 to implement it immediately with prospective effect. The delay in implementation resulted in extending undue benefit of ₹8.92 crore to the employees of the units of Nuclear Power Corporation of India Limited (Kudankulam Nuclear Power Project, Madras Atomic Power Station, Kakrapar Atomic Power Station) and Bhartiya Nabhikiya Vidyut Nigam Limited during the period from November 2013 to June 2017.

Madras Atomic Power Station and Kudankulam Nuclear Power Project stated in February 2022 and September 2022, respectively, that they had followed the instructions received from Nuclear Power Corporation of India Limited/Department of Atomic Energy.

Department of Atomic Energy stated (September 2024) that the Department of Expenditure office Memorandum dated 11 November 2013 and Inter-Departmental Note dated 12 August 2014 advised the Department of Space and Defence Research and Development Organisation, respectively, to consider withdrawing the said scheme. Department of Atomic Energy had not received such instructions from the Department of Expenditure regarding withdrawing the scheme of two additional increments. The Department received the instruction from the Department of Expenditure through Member (Finance)-Atomic Energy Commission, only on 19 May 2017, for discontinuation of the aforesaid scheme with immediate effect and accordingly, the Department *vide* office memorandum dated 13 June 2017 discontinued the scheme of two additional increments.

The contention of DAE that the two additional increments were continued beyond November 2013 in absence of instructions from Department of Expenditure is not valid since, after

receiving instructions from Department of Expenditure/Ministry of Finance in November 2013, a Joint Working Group meeting was held on 21 February 2014 to discuss on the directives of Department of Expenditure/Ministry of Finance on withdrawal of two additional increments. This Joint Working Group consisted of Senior Officers who represented the Department of Atomic Energy, Department of Space and Defence Research and Development Organisation. The Joint Working Group had opined that sudden withdrawal of incentive in the form of two additional increments would not be in order as it would affect the morale of the Scientists/Engineers. Thus, the Department of Atomic Energy was fully aware of the instructions of Department of Expenditure/Ministry of Finance and its applicability to Department of Atomic Energy and all its units which included Nuclear Power Corporation of India Limited/Bhartiya Nabhikiya Vidyut Nigam Limited.

Further, it is a laid down practice that instructions/orders of any Ministry/Department take effect prospectively from the date of issue of the instructions/orders, unless specifically otherwise mentioned and the Ministries/Departments concerned cannot adopt the same from different arbitrary dates.

Thus, the advice of the Ministry of Finance was applicable to Department of Atomic Energy from 11 November 2013, being the date of the note and therefore the grant of additional increments beyond November 2013 was irregular as it did not have the approval of the Ministry of Finance.

7.2 Non-settlement of insurance claim for damaged equipment

Madras Regional Purchase Unit, Chennai did not maintain sufficient balance of premium with the Insurance Company, which resulted in repudiation of an Insurance claim of ₹0.56 crore on equipment that was damaged during transit.

Purchase Manual of Department of Atomic Energy stipulates that as per Section 64(V) (B) of Insurance Act 1938, Underwriters can only assume risks if adequate premium is available with the insurer at the time of commencement of transit. Further, the Purchase Manual stipulates that it should be ensured that sufficient balance is maintained in the deposit account kept with Insurance Company to avoid disallowance of claims towards loss/damage of consignments.

Directorate of Purchase and Stores, Mumbai, the centralised agency of Department of Atomic Energy responsible for its materials management functions had an all-risk Marine Transit Insurance Cover for Import and Export consignments of Department of Atomic Energy (July 2009) with an insurer, valid from 15 July 2009 to 14 July 2011. The insurance

cover was extended by Madras Regional Purchase Unit, a unit under Directorate of Purchase and Stores, on two subsequent occasions up to January 2013. As per terms of the insurance cover, an advance deposit account for ₹3 lakh was to be maintained and premium for insured consignments were to be adjusted against this, to be recouped once it was near utilisation.

Madras Regional Purchase Unit, Chennai, placed (May 2009) a purchase order on a foreign vendor in United Kingdom for supply of cryogen free double stage adiabatic demagnetisation refrigerator at a cost of Great Britain Pound 168214.00 (₹1.67 crore). The equipment was required at Indira Gandhi Centre for Atomic Research, Kalpakkam, a unit of Department of Atomic Energy.

The equipment was shipped on 8 October 2011 but was received at Indira Gandhi Centre for Atomic Research on 21 October 2011 in a suspected damaged condition and a provisional claim was lodged (9 November 2011) with the insurance company. Meanwhile, payment of ₹1.20 crore towards 90 *per cent* of the order value[58] was released (October 2011) to the vendor. After inspecting the damaged equipment, the vendor agreed to repair the same at their premises in United Kingdom. The Insurance Company also agreed to honour the claim for repair and freight charges of the damaged equipment. Accordingly, Madras Regional Purchase Unit re-exported (June 2012 and August 2012) the equipment to the vendor and placed (August 2013) a purchase order for repair of the damaged equipment at a cost of Great Britain Pound 59064 (₹0.56 crore). Madras Regional Purchase Unit also lodged (September 2013) a claim of ₹0.56 crore with the Insurance Company towards order value, charges towards re-export and clearing charges.

Subsequently, the vendor informed (August 2014) Madras Regional Purchase Unit that the system could not be repaired and suggested an alternative to replace it with equivalent equipment[59], the cost of which would be adjusted against the earlier purchase order. Madras Regional Purchase Unit amended (March 2015) the repair order to substitute it with supply of the new equipment at an additional cost of Great Britain Pound 65720.80 (₹0.66 crore). Madras Regional Purchase Unit also released (April 2015) ₹0.16 crore towards the balance 10 *per cent* payment of the earlier purchase order. The new equipment was received in January 2016 and Madras Regional Purchase Unit released (January/February 2016) payment of ₹0.64 crore to the vendor against the additional cost.

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[58] ***According to the payment terms, 90 per cent of the value was to be paid on receipt of shipping documents and the balance 10 per cent along with installation charges was payable after satisfactory installation, demonstration and final acceptance of the equipment.***

[59] ***Triton 200X He3/He4 based refrigerator.***

However, Madras Regional Purchase Unit did not pursue the matter of insurance claim with the Insurance Company and it remained pending for over eight years. Eventually, the Insurance Company repudiated (September 2019) the claim of Madras Regional Purchase Unit on the ground that sufficient balance of premium was not available as on 13 October 2011 to insure the consignment.

Audit observed that there was nil balance as of 1 October 2011 in the deposit account kept with the Insurance Company. Further, the balance in the deposit account never crossed the threshold limit of ₹3 lakh during the period 8 October 2011(Date of shipment) to 9 November 2011 (Date of lodging of provisional claim) which indicated that Madras Regional Purchase Unit did not recoup the deposit amount as required in terms of the insurance cover contract. Non-availability of sufficient balance in the deposit account was also in contravention of the Department of Atomic Energy Purchase Manual. This resulted in repudiation of the insurance claim and loss of ₹0.56 crore.

Madras Regional Purchase Unit stated (July 2020) that the Department had requested (November 2019) the Insurance Company for review of their decision. Directorate of Purchase and Stores stated (September 2020) that the details of the recouping of the deposit made based on the statement of the amount utilised against the premium was not furnished by the Insurance Company. Directorate of Purchase and Stores further stated (December 2020) that there being a difference of opinion relating to the interpretation and application of the provisions of the contract, resulting in dispute, they had proposed to initiate arbitration proceedings. The same was reiterated by the Department of Atomic Energy (November 2021). However, the Department, in its reply (May 2023) stated that they could not approach the mechanism of arbitration as the authorities of the Administrative Mechanism for Resolution of CPSEs Disputes had said that the case does not fall under their purview.

The reply may be viewed in light of the fact that it was also the responsibility of the Directorate of Purchase and Stores to ensure a sufficient balance in the deposit account to ensure that claims for insurance were not disallowed due to insufficient premium balance.

The Directorate of Purchase and Stores did not safeguard its financial interest adequately by maintaining sufficient balance in the deposit account leading to non-settlement of insurance claim of ₹0.56 crore.

The matter was referred to the Department in July 2024, their reply was awaited as of March 2025.

7.3 Information Technology Audit of Functioning of Integrated Information System implemented in the Heavy Water Board, Department of Atomic Energy

7.3.1 Introduction

The Heavy Water Board is a constituent unit of the Industries and Minerals Sector under the Department of Atomic Energy, Government of India. It is entrusted with the mandate of supporting the three-stage Indian Nuclear Power Program through the production of Heavy Water (Deuterium Oxide) and speciality materials such as Enriched Boron, Nuclear-grade Sodium, Nuclear solvents for the front-end and back-end fuel cycles, *etc.* Starting in 1963 with a pilot plant at Bhabha Atomic Research Centre (BARC), the Heavy Water Board now has seven different organisational units, *viz.,* Heavy Water Plants at Kota, Manuguru, Hazira, Tuticorin and Thal; and Heavy Water Board Facilities at Talcher and Vadodara. The progress of the Heavy Water Board has transformed India into the world's largest producer of Heavy Water. The production not only meets the in-house Heavy Water requirements for the Indian Nuclear Power Program but also facilitates export to other countries.

Figure 7: Heavy Water Plants in India

Apart from the above, Heavy Water Board is also engaged in exploring avenues for the development and promotion of non-nuclear applications of Heavy Water and Deuterium with applications in the fields of Life Sciences, Mineral Exploration, Nutritional Studies, Optical Fibre industry, Medicinal Chemistry in Pharmaceuticals, *etc.*

7.3.1.1 Revamping the Integrated Information System

Integrated Information System (IIS) is a customised Enterprise Resource Planning (ERP) application developed by Electronics Corporation of India Limited (ECIL) for Heavy Water Board for office automation activities and deployed at its Heavy Water Plants as well as its Central Office.

Heavy Water Board reviewed (January 2011) the older version of IIS and found that the hardware server (LH 6000), the operating system (Windows NT) and the database (Oracle 8i) were close to obsolescence. As per the review, the Security Audit conducted on the system also highlighted vulnerabilities for which patches were not available. Further, the Heavy Water Board had identified some important functionalities for its operations, which had not been implemented in the earlier system. These additional functionalities required the following.

- Distributed system where the data can be transferred between the sites and the central office seamlessly.
- Web-enabled interface, Email/SMS integration, Audio-visual Alerts, *etc.*
- Major business processes under functions such as Indenting and Purchase, Project Management, Annual Performance Appraisals, Plant Operation and Performance Management, user-friendly Maintenance Management and many applications of Accounts and Administrative use that were not covered in the scope of the older version of IIS.
- Bilingual support for the database at the back end and the application at the front end.

So, the Heavy Water Board decided (January 2011) to revamp the older version of IIS to address the above deficiencies and implement a modern ERP application.

7.3.1.2 Integrated Information System

Heavy Water Board signed a MoA with ECIL, a Government of India owned Public Sector Undertaking, in October 2017 for the development and implementation of a newer version of IIS[60] for Heavy Water Board and Heavy Water Plants, with the aim to establish the system for business process automation in areas including Administration, Finance, Accounts, Maintenance, Stores and Inventory, Purchase, Project Monitoring and Safety for a period of four years, *i.e.*, two years up to Go-live and thereafter two years for maintenance and support.

To achieve the objectives of the project, a budget of ₹14.35 crore was allotted towards revamping the old IIS application and upgrading the IT infrastructure at Heavy Water Board and Heavy Water Plants. The project timeline for development and implementation was divided into several phases (planning, analysis, design, development, testing, training and deployment) and milestones. The new IIS had been implemented at Heavy Water Board Central Office as well as the seven Heavy Water Plants by December 2020 and the system Go-live was declared in October 2021. As of September 2023, Heavy Water Board had incurred

[60] ***New version of IIS hereinafter referred to as IIS.***

expenditure of ₹13.44 crore for revamping old IIS application along with IT infrastructure and ₹3.63 crore for maintenance and support services at Heavy Water Board and Heavy Water Plants.

7.3.1.3 Broad features of IIS

The system has eight main modules with 55 sub-modules (listed in ***Annexure 32***), the details of which are given in ***Figure 8***.

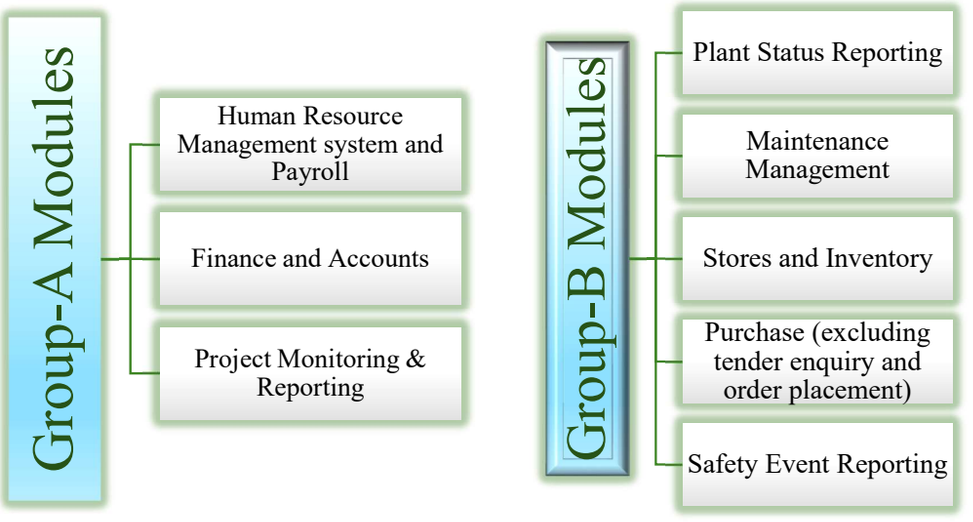

Figure 8: Modules under Group-A and Group-B

As can be seen from the above Figure, the Group A Modules mainly covered the supporting business functions of Heavy Water Board such as HR, Finance and Accounts and Project Monitoring and Reporting. While the Group B Modules mainly covered the core business functions of the Heavy Water Board, such as Plant Status Reporting, Maintenance Management, Stores and Inventory, Purchase and Safety Event Reporting.

7.3.1.4 Objectives of IIS

The objectives of IIS-Heavy Water Board are to establish an IIS with up-to-date application and database for-

- HR management and manpower development
- Plan Project Monitoring
- Finance and accounts information management
- Plant Status Reporting
- Maintenance Management
- Stores and Inventory

- Purchase (excluding tender enquiry and order placement)
- Safety Event Reporting

The IIS was intended to harmonise, standardise and interconnect the databases maintained and used by all Heavy Water Plants to provide an up-to-date integrated database for management functions in Heavy Water Board and its Plants.

7.3.1.5 Audit Scope and Methodology

Relevant documentation from the date of the proposal for the project of revamping the old IIS, transactions and system reports for the period from the date of implementation of IIS, *i.e.,* 31 December 2020 to 30 September 2023, was examined in Audit. All the modules in the system as of September 2023 were included in the scope of the Audit.

An Entry Conference was held in October 2023 with the Chairman and Chief Executive of Heavy Water Board, in which the Audit objectives, scope of Audit, Audit methodology and Audit criteria were explained. An Exit Conference was held in August 2024 with the Chairman and Chief Executive of Heavy Water Board. The report takes into consideration the views and responses received from Heavy Water Board Management.

7.3.1.6 Limitations to Audit

i. Absence of Security Audit Report

Heavy Water Board Management did not produce the documentation and information pertaining to the Security Audit conducted on the older version of IIS, which had identified and highlighted vulnerabilities for which no patches were available, as discussed earlier. In the absence of the same, Audit was unable to derive assurance on whether the Management had implemented the recommended actions and mitigated the highlighted information security risks as listed in the Security Audit Report, after the deployment of the newer version of IIS.

ii. Absence of Test Reports

According to Clause 2.3.4 of the MoA between ECIL and Heavy Water Board dated 31 October 2017, 'ECIL shall submit their testing methodology and plan for Unit, Functional, System, Integration and User Acceptance Testing (UAT) and get it approved by Heavy Water Board. ECIL shall submit the report with a response time to Heavy Water Board for all the tests for approval.' Further, as per the project schedule mentioned in the Detailed Project Report, software testing of IIS includes Unit testing, Integration testing and Functional testing with test cases conducted by software engineers, as well as Functional testing by end-users.

Audit noticed that apart from User Acceptance Test Reports, Heavy Water Board had not maintained Test Reports from Unit, Functional, System and Integration Tests conducted for IIS.

Heavy Water Board stated that ECIL engineers had conducted these tests, but the Test Reports were not furnished to Audit.

In the absence of these Test Reports, Audit was unable to derive assurance on whether all the issues/limitations identified during these tests, if thoroughly conducted, had been subsequently resolved and that no issues remained unaddressed in the IIS.

7.3.2 Governance Mechanism for IIS

IIS was planned for implementation in seven phases by ECIL, which was responsible for the collection of source code of the older version of IIS and the other applications integrated with it, analysis of the gaps that were required to be filled to meet the current business requirements of Heavy Water Board Central Office and the Heavy Water Plants and design and development of the new version of IIS.

ECIL was responsible for design, system architecture, development and maintenance responsibilities for two years after the Go-live date.

The Project Planning and Implementation Group Committee was constituted to review the progress of the implementation of the project as per the provisions of the MoA.

The IIS Procurement Committee (IIS-PC) was constituted to carry out procurement for the project, as per the provisions of the MoA.

7.3.2.1 Deficiencies in preparation of user requirements

User Requirement Specification (URS) is a crucial document in the development of any software that defines the requirements of the user. It outlines the features of the product, its functions and its performance that are needed to satisfy the user's requirements. It describes the business needs for what users require from the system. Audit reviewed the user requirements for the various modules and noticed the following deficiencies.

- Out of the total 55 sub-modules ***(Annexure 32)*** under eight modules of IIS, the URS of six sub-modules ***(Annexure 33)*** were neither reviewed nor approved by the Competent Authority. In the case of 39 sub-modules ***(Annexure 33)***, URSs were approved but not reviewed by the Competent Authority, whereas in case of only eight sub-modules, the Competent Authority had reviewed as well as approved the URS.

- In the case of the remaining two sub-modules (Leave Travel concession (1027- LTC) and Compilation (COM), the URS were not available on record.

As a result of deficiencies in review and approval of the User Requirement Specification (which included the core business functions of Heavy Water Board Central Office and the Heavy Water Plants), Audit was unable to derive assurance that the risks associated with incomplete/incorrect implementation of these sub-modules had been mitigated. This deficiency had in turn contributed to the deficiencies in the functionalities and application controls finally implemented in the system, as described in subsequent paras of this Report.

Heavy Water Board replied (April 2024) that due care had been taken in preparation of URS after two to three iterations of reviews.

The response was not tenable, since the URS had not been reviewed or approved by the Competent Authority, with formal sign-offs on the user requirements for various sub-modules.

7.3.2.2 Deficiencies in monitoring the implementation of IIS

For reviewing the status of the implementation of IIS, weekly review meetings were held with the Director (Technical) for the period from December 2018 to March 2020.

Audit reviewed the status report of the weekly review meetings and noticed that only 69.41 *per cent* of the Forms and Reports of the sub-modules under Group A and only 25.5 *per cent* of the Forms and Reports of the sub-modules under Group B had been developed and accepted, till the last weekly meeting held in March 2020.

The major committees for IIS, *i.e.,* Project Planning and Implementation Group and Procurement Committee, had last met in September 2019. The deployment of 24 sub-modules as well as the completion of data migration, had been noted as pending, as of March 2020.

HWB stated (April 2024) that during the period of the COVID-19 pandemic, *i.e.,* after March 2020, review meetings had been conducted through online mode and that the minutes of the weekly review meetings, held after March 2020, had not been maintained. As a result, Audit was unable to derive assurance that further implementation had been effectively monitored by the Governance Committees during the period from April 2020 to the date of Go-live, *i.e.,* 31 October 2021.

As a result of the absence of documentation of the meetings held by the Governance Committees, Audit was unable to derive assurance as to whether-

- The correct status of implementation had been reported to them.

- The analysis of reasons for delays in implementation, non-implementation and non-utilisation of the sub-modules of the system (discussed in *para 7.3.3.3*), even after the Go-live date had been conducted by them.
- The actions to be taken to resolve bottlenecks to the implementation and utilisation of the sub-modules had been communicated by them to the concerned users.

The risks associated with the deficiencies in the functionalities and application controls finally implemented in the system, as described in subsequent paras of this Report, should have been reported to the Governance Committees and appropriate mitigation measures should have been recommended by them. However, there was no documentation maintained on the functioning of the Governance Committees for the crucial 20 month period from March 2020 to October 2021 (Go-live date).

Recommendation 19:

HWB should direct the Governance Committees for IIS to meet at prescribed frequencies and maintain clear documentation on progress in implementation, identification of risks and recommendation of mitigation measures to achieve the revised timelines for full utilisation of the system as intended.

7.3.2.3 Absence of Version Control System

A Version Control System (VCS) is a software tool that allows developers to manage changes to source code and other files over time. A VCS stores all versions of files in a central repository, which can be either local or remote and stores, tracks and collaborates on code changes, ensuring the integrity, traceability and stability of the software. VCS maintains a complete history of all changes made to each file, including what was changed, when it was changed and by whom it was changed.

Audit observed that for version control of the source code of IIS, HWB does not maintain a structured VCS (such as Git or Subversion) for managing changes to its source code. Instead, the organisation relies solely on manual backups of the production server before incorporating changes.

The absence of a structured VCS results in avoidable risks related to traceability and accountability. Without a comprehensive history of changes, it becomes challenging to identify who made specific changes, when they were made and why they were made. This lack of traceability not only inhibits effective collaboration and problem-solving among team members but also leads to an inability to fix responsibility in case of gross errors/malicious actions.

HWB replied (April 2024) that its IT section shall explore the feasibility and practicality of using VCS for IIS.

7.3.2.4 Deficiencies in MIS Reports on the functioning of IIS

Clause 2.3.7.5 in the Scope of Work, as outlined in Annexure A of the MoA dated 31 October 2017 between HWB and ECIL for the development and implementation of the IIS for HWB, states that- 'The following is an indicative list of MIS reports to be submitted by ECIL during stabilisation and maintenance and support period. ECIL shall also draw an exhaustive list of reports in consultation with HWB and submit hard as well as soft copies of each of the reports regularly in a mutually decided format and frequency.

1. Summary of Incidents Reported, Application Downtime, Resource Utilisation, Security Vulnerabilities detected in Database and Application Software, *etc.*
2. Feedback report from users.
3. Bug/Defect Resolution Reports, including the analysis of defects resolved, pending completion time, responsiveness and concern areas.
4. Change Request Logs with their resolution status.
5. Log of breakdown, fix and preventive maintenance undertaken.'

Despite the MoA's emphasis on drawing an exhaustive list of reports and submitting them regularly in a mutually decided format and frequency, Audit observed that only a Maintenance Record for IIS is being maintained by HWB.

The Maintenance Record contained details related to issues and bugs (such as issue/bug description, reported date, type of issue, expected date of completion, reported officer, engineer name, number of days for completion, module name and form/report details) only.

The above-mentioned Reports were essential for post-implementation monitoring during the stabilisation, maintenance and support period.

The absence of these prescribed Reports resulted in the avoidable risks of lack of oversight on the crucial aspects which were to be contained in the prescribed Reports.

HWB replied (April 2024) that in the MoA, it was mentioned that ECIL shall submit the reports on a regular basis in a mutually decided format and frequency. Accordingly, the format was decided and HWB has been maintaining a 'Maintenance Record' for IIS in the

decided format and a similar format is being used for all types of MIS reports. These records include issues reported by users, improvements suggested by users, changes incorporated in the system as a part of continual improvements, *etc.,* as mentioned in MoA related to MIS reports.

The reply from HWB is untenable because it does not address the specific reporting requirements outlined in the MoA. The Maintenance Record maintained by HWB does not include essential reports on Application overall downtime, Resource Utilisation, Security vulnerabilities detected in the Operating System, Databases and Application Software, *etc.*, user feedback, change requests, log of breakdown, fixes and preventive maintenance undertaken.

7.3.2.5 Inadequate documentation of data migration

Data migration refers to the process of transferring data from one system or storage infrastructure to another. This process involves extracting, transforming and loading data from the source to the target system, ensuring that the information is accurately and securely transferred while maintaining its integrity. Data migration is a critical aspect of organisational IT operations and system upgrades. Successful data migration is essential for ensuring the continued operation of an organisation's systems and processes.

The older version of IIS was operational from 2003-04 and the newer version of IIS went live in October 2021. The data in the older version of IIS was required to be migrated to the newer version of IIS, before hosting the same in the production server.

Audit noticed that there was no detailed documentation outlining the step-by-step migration process, with the maintenance of comprehensive logs to track each stage of the migration. Inadequate documentation hinders the ability to trace and verify the migration process, leading to a lack of transparency. Without a clear record of the migration steps, troubleshooting and resolving issues become more time-consuming and challenging. The absence of comprehensive logs raises concerns about the accuracy and integrity of the migrated data.

HWB replied (April 2024) that HWB shall prepare documentation for the data migration process and its monitoring in future, as part of continuous improvements.

7.3.2.6 Absence of project evaluation report and non-identification of Key Performance Indicators

The project was completed in December 2020. IIS went live in October 2021 and HWB entered into a new contract for maintenance and support with the developer in November

2021. However, no efforts were made to undertake a post-completion evaluation of the project. HWB stated in January 2024 that the evaluation of the IIS project is a continuous process and continuous improvements in IIS had been carried out based on the feedback received/issues reported by users/domain experts. However, no project evaluation report has been prepared.

In the absence of Project Evaluation Report documentation, Audit was unable to derive assurance that HWB had effectively taken stock of the revised timelines for completion of implementation and utilisation of all the originally intended modules of IIS. This was especially important since the Group B modules which cover the key business functions of HWB and Heavy Water Plants are yet to be implemented/utilised as intended, even as of March 2024.

Further, Audit noticed that Key Performance Indicators had not been identified by HWB to measure the progress of IIS implementation, in alignment with its objectives. These Indicators should have included aspects such as (a) progress of actual implementation against the scheduled timelines, (b) cost of actual implementation against the approved budget estimates, (c) actual status of implementation of each of the functionalities and use of modules and sub-modules against those planned and (d) actual status of implementation and use of modules and sub-modules at each of the eight sites at which IIS was required to be deployed.

HWB stated that the status of IT projects has been reviewed on a daily basis by General Manager (Technical), had been monitored by senior management at periodic intervals and that HWB was maintaining the Maintenance Record.

The response was not tenable, since there was no documentation in support of the reviews conducted by Senior Management or the Governance Committees from March 2020 onward and no formal documentation on Project Evaluation had been maintained and the deficiencies in the Maintenance Record have been discussed in this Report at *Para 7.3.2.4*.

7.3.2.7 Ineffective monitoring of utilisation of IIS

During September 2021, HWB intimated to all its sites that ECIL had developed all the modules of Group A and B. With the combined efforts of ECIL, HWB and Heavy Water Plants, 43 sub-modules of Group A and one module of Group B were declared as Go-live and all the sites were requested to use the newer version of IIS for those functionalities. It was also instructed that the status report of usage of those modules was to be submitted to the

Director (Technical/Operation) office once in 14 days (14th and 28th of that month) without fail so that the status of effective use of IIS could be monitored.

However, copies of such status reports were not available on record at HWB Central Office or any of the sites. No steps or follow-up action had been taken despite the non-compliance with the executive instruction to submit fortnightly reports on the status of use.

In the absence of these status reports, Audit was unable to derive assurance that the status of use had been correctly reported and monitored and whether action to address issues identified by users had been taken by HWB. This was especially important since the Group B modules which cover the key business functions of HWB and Heavy Water Plants are yet to be implemented/utilised as intended, even as of March 2024.

HWB stated (April 2024) that status reports had not been received from the sites and the Director (Technical/Operation) had sent a reminder (March 2022) on this subject. In addition to the status reports, the actual status of use had also been ascertained through continuous communication with the sites through email/telephone/VC meetings.

The response was not tenable, since documentation on the status reports as well as such emails/meeting minutes were not available on record. Without such documentation, there was insufficient evidence to demonstrate effective oversight and utilisation of the system.

7.3.2.8 Absence of Security Audit Clearance Certificate

In order to maintain the confidentiality, integrity and availability of information and services, Guidelines for Indian Government Websites (GIGW) stipulate that each website, web application, web portal or mobile app undergo a security audit and obtain an Audit Clearance Certificate issued by NIC, Standardisation Testing and Quality Certification, or a CERT-In/ Standardisation Testing and Quality Certification-empaneled vendor, before being hosted in a production environment.

HWB implemented IIS on 31 December 2020, which went live on 31 October 2021. HWB stated that the IT Security Audit[61] of HWB was carried out (August 2022) by an Audit Team appointed by the Computer and Information Security Advisory Group (CISAG), DAE. However, this IT Security Audit Report was not furnished to the CAG Audit. The fact remained that HWB did not have a 'safe to host' Audit Clearance Certificate before placing the IIS in the production environment.

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[61] ***DAE has specialist groups viz., Computer and Information Security Advisory Group (CISAG) and Task force for Instrumentation and Control Security (TAFICS) to look after cybersecurity/information security of constituent units of DAE, including regular cyber security audit.***

HWB stated (April 2024) that, as per GIGW 3.0 guidelines, a Security Audit is mandatory for Government Websites that are in the public domain. Since IIS is the in-house ERP for business process automation, such a Security Audit was not mandatory. Regarding the CISAG Audit Report, HWB stated that it was still being pursued with the DAE.

The response needs to be considered along with the fact that since IIS handles confidential and sensitive data, its security is a prime concern. Since it functions with network connectivity across geographic locations, IIS remains susceptible to various security threats.

Audit observed that input fields in IIS are susceptible to Cross-site scripting[62] attacks. This vulnerability could allow users/attackers to inject and execute arbitrary scripts within the application, compromising its security and potentially causing damage to the system and data. This vulnerability allows users to inject and execute arbitrary JavaScript code within the IIS, potentially leading to unauthorised data access, manipulation and other malicious actions.

HWB replied (May 2024) that all the forms where user inputs are required shall be reviewed again for further improvements.

Adoption of input validation controls, context-specific output encoding and deployment of a Content Security Policy are vital controls required to be implemented for IIS. A comprehensive approach to secure coding practices, regular security assessments and immediate review of all input fields are essential for ongoing protection.

7.3.3 Implementation of IIS

IIS comprises 55 modules/sub-modules, which were proposed to be implemented in HWB (Central Office) and its seven sites by ECIL. Deficiencies noticed by Audit in the implementation of IIS are described in the following paras.

7.3.3.1 Absence of Release Plan for Functionalities

A Release Plan is a formally documented and structured document that outlines the complete process of delivering a specific version of a software product. It includes key details such as the phase-wise deployment and rollout schedule, planned release dates, release numbers, change requests to be included and any dependencies or risks associated with the release.

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[62] ***Cross-site scripting represents a severe security vulnerability commonly encountered in web applications, where attackers inject malicious scripts into web pages, potentially leading to data theft, session hijacking, or manipulation of the website.***

According to Clause 2.3.7.4 of the MoA between HWB and ECIL, the release management procedure should be defined in conjunction with HWB to ensure the smooth transition of application changes from the release environment to the production environment.

Audit, however, noticed that a Release Plan had not been prepared for the IIS project. The absence of a Release Plan, as required by the MoA, significantly impeded effective software release management, adherence to the phase-wise deployment and rollout of functionalities, implementation of change requests on time and periodic maintenance and updating of the software.

HWB stated (February 2024) that MoA and the Project Completion Certificate are to be referred to as the 'Deployment and Release Plan'. It further added that the current version of IIS in the production environment is to be considered as the 'First Major Release'. After that release, as there are no architectural changes required in IIS, no further major release of the software has been declared. Changes that are required are documented in the Maintenance Record. Effective use of the modules deployed is being planned in a phased manner, by making efforts for the utilisation of sub-modules such as Payroll, Stores Inventory, *etc.,* at HWB and at the sites.

The response was not tenable, as the MoA only provides a summary of deliverables and this summary does not fulfil the criteria for a Release Plan as outlined in Clause 2.3.7.4. The Project Completion Certificate has details of financial sanction, scheduled completion date, actual completion date and total expenditure incurred, but it does not address the specific requirement for a Release Plan which could have facilitated effective monitoring of the progress in implementation.

The Project Planning and Implementation Group Committee was tasked with ensuring the smooth and timely implementation of the IIS project and reviewing its progress. However, the Committee did not insist on the development of a detailed Release Plan as required by Clause 2.3.7.4 of the MoA. This was a major control deficiency. Additionally, the minutes of the six meetings of the Project Planning and Implementation Group Committee did not outline specific timelines or actions to ensure full implementation and utilisation of the IIS, in the absence of a Release Plan. Further, HWB stated (April 2024) that due to the COVID-19 pandemic, review meetings after March 2020 were conducted online and the minutes of these meetings were not recorded. As a result, Audit was unable to derive assurance whether appropriate timelines and actions were adopted in online review meetings to achieve the project's full implementation and utilisation, in the absence of a Release Plan.

7.3.3.2 Absence of test plan and test cases

A test plan is a detailed document that outlines the overall testing strategy for a specific project, encompassing the scope, objectives, test environment, test tool, risk analysis, test design, resources, schedule and activities necessary for effective testing. Test cases are detailed steps or conditions executed to verify whether a particular system functionality works as intended. They provide a systematic approach to ensure the quality and reliability of the software.

According to Clause 4.2.2(b) of the IT security policy of HWB, test plans and test cases are required to be obtained from a third party if development work is outsourced.

Audit observed non-compliance with the above requirements of the test plan and test cases, as HWB had not prepared the same. The absence of test plans and test case documents resulted in a lack of assurance on whether development, implementation and subsequent change had taken place as originally intended and those risks arising from these processes had been identified and mitigated. As the IIS evolves, integration/regression testing is essential to ensure that new changes do not negatively impact existing functionalities. Without a predefined set of test cases, conducting regression testing carries a high risk of errors.

HWB noted (April 2024) the observation for future implementation.

7.3.3.3 Non-implementation of modules/sub-modules

The IIS application was designed with eight modules (Group A-3, Group B-5) and there were altogether 55 sub-modules (Group A-50, Group B-5) under these eight modules.

Audit noticed that all these 55 sub-modules of the IIS as originally intended by the Go-live date have not been implemented at HWB and Heavy Water Plant sites and that some modules have been implemented but their use has not been made mandatory, as of 30 September 2023.

i. Group – A Modules

The three Group A modules were intended to cover the supporting business functions of HWB.

The full list of intended sub-modules under the Human Resource Management System module, the Finance and Accounts module and the Project Monitoring and Reporting module have not been implemented as of September 2023, more than two years after the completion of

the scheduled Go-live date. The details of sub-modules out of five sites[63] under the Group A modules, which have not been implemented/have been partially implemented/have been implemented but have not yet been made mandatory for utilisation, are listed below.

Table 19: List of modules not yet used in the sites

Sl. No.	Sub-module name which not implemented/partially implemented/implemented but not yet used	The number of units where the module is not implemented/ not used
1.	HR- Recruitment -> Manpower Planning (MPP)	5
2.	HR- Recruitment -> Recruitment (RCT)	4
3.	HR- Character and Antecedents Verification (CAV)	5
4.	HR- Recruitment-> Appointment (APT)	5
5.	HR- Recruitment -> promotion (PRO)	5
6.	HR- Recruitment -> Transfer (TRA)	5
7.	HR-Employee Master and Service Book (EMS)	2
8.	HR- Establishment -> Annual Performance Assessment Report (APA)	5
9.	HR- Establishment -> Pay Fixation (PAF)	5
10.	HR- Establishment -> Performance Related Incentive Scheme (PRIS)	5
11.	HR- Establishment -> Pension (PEN)	5
12.	HR- Establishment -> House Building Advance (HBA)	5
13.	HR- Establishment -> Medical claim (MED)	5
14.	HR- Establishment -> Leave Travel concession (LTC)	5
15.	HR- Establishment -> Tours (TOR)	3
16.	HR- Establishment ->CPF/GPF Advance (CGA)	5
17.	HR- Establishment -> Loans and Advances (LON)	5
18.	HR- Establishment -> Children Education Assistance (CEA)	4
19.	HR- Industrial Relation -> Disciplinary Cases (DIA)	4
20.	HR- Industrial Relation -> Residential (Government Accommodation) Allotment System – Applicable for Heavy Water Plants (QAR)	5
21.	HR- General Administration -> Air Travel (AIR)	4
22.	HR- General Administration -> Vehicle Request and Gate Pass (VGP)	5
23.	HR- General Administration -> Reimbursement (REM)	4
24.	HR- General Administration -> Tracking of Paper Consumption (PCO)	5
25.	HR- General Administration -> Liveries, Furniture and Fixtures (LFF)	5
26.	HR- General Administration -> Dispatch (DIS)	4
27.	HR- Hindi Section related reports (HIN)	5
28.	HR- Library (LIB)	5

[63] ***Heavy Water Plants (Thal and Hazira) are under administrative control of Heavy Water Board. Therefore, the status of implementation is same as Heavy Water Board, Mumbai.***

Sl. No.	Sub-module name which not implemented/partially implemented/implemented but not yet used	The number of units where the module is not implemented/ not used
29.	HR- Training (TRG)	5
30.	HR- Qualification and Authorisation (QIS)	5
31.	HR- Time Attendance System (TAS)	5
32.	HR- Tracking of Identity Card (IDC)	4
33.	HR- Payroll (PPI)	3
34.	HR- Visa/Passport Approval	4
35.	FA – Tender Processing (TPS)	5
36.	FA – Payment by Cheque/Cash (PCC)	5
37.	FA – Loans and Advances (LOA)	5
38.	FA – Temporary Advance (TAD)	5
39.	FA – Leave Travel concession (LTC)	5
40.	FA – Works and Contract Payment (WCP)	5
41.	FA – RCF, KRIBH Central Office and TDP Payment (RKT)	5
42.	FA – Contingency Payment (CPA)	5
43.	FA – Pension (PEN)	5
44.	FA – GPF/CPF Sanction (GCS)	5
45.	FA – Compilation (COM)	5
46.	FA – Other Accounting/Auditing Requirements (AAR)	5
47.	FA – Ledger/Broadsheets maintained by Accounts (LBA)	5
48.	Project Monitoring and Reporting	5

HWB stated (April 2024) that the IIS application with all the sub-modules is available in the production environment and is ready to use. However, effective utilisation of IIS is being planned in a phased manner by making efforts to first utilise sub-modules such as Payroll at HWB and its sites, while users are getting acquainted with the IIS functionalities. HWB also informed that the sub-modules, such as Payroll, were intended to be utilised at Heavy Water Plants after verification and validation of data at Heavy Water Plant (Manuguru), Heavy Water Plant (Kota) and Heavy Water Facility (Vadodara), where it had been ongoing for the previous few months.

ii. Group – B Modules

The five Group B modules were intended to cover the core business functions of HWB. Out of seven sites[64] the details of Group B modules which had not yet been utilised (as of September 2023, two years after the scheduled Go-live date) are listed in the table below.

[64] ***Group B modules are plant specific modules, thus not implemented in Heavy Water Board (Central Office), Mumbai.***

Table 20: Group B modules which have not yet been utilised

Sl. No.	Modules not yet utilised	Functionalities of these modules	No. of units where the module is not utilised as of November 2023	Impact of the absence of the modules
1.	Plant Status Reporting (PSR)	This module was intended to be used for monitoring the status of plant utilities, real-time computation and reporting.	7	Without this module, there was a lack of real-time visibility into plant operations for the management of the Heavy Water Plant as well as HWB Central Office, which can lead to inefficiencies in resource utilisation and delayed decision-making.
2.	Maintenance Management (MM)	This module was intended for maintenance of the history of equipment, preventive maintenance scheduling, breakdown maintenance details, Annual Turn Around (ATA) maintenance details, spare part requirements, *etc.*	7	In the absence of this module, HWB and Heavy Water Plants have to rely on manual record-keeping, which increases the likelihood of missed maintenance activities, unplanned equipment downtime and higher maintenance costs. Moreover, the manual process does not provide the analytical capabilities needed to optimise maintenance schedules and extend the lifespan of critical assets.
3.	Stores and Inventory (SI)	This module was intended for maintaining the records of items, updating the stock, generating slow-moving item details, inventory analysis, disposal, capital items management, *etc.*	3	The absence of the full implementation and use of this module results in risks associated with overstocking or stockouts, increased holding costs and potential disruptions in production due to the unavailability of necessary materials.
4.	Purchase – Purchase Indents Management and Follow-up System (PIM)	This module was intended for activities like the raising of indents and financial concurrence for budget provision.	7	The absence of implementation and use of this module results in risks associated with delays in procurement, lack of oversight in financial planning and inefficiencies in the tendering process, impacting overall project timelines and costs.
5.	Safety Event Reporting (SER)	This module was intended for the maintenance of accident statistics on reportable disabling injuries (RDI) and Safety Related Unusual Occurrences statistics.	7	The absence of implementation and utilisation of this module results in risks associated with inadequate real-time tracking of safety incidents and a lack of actionable analytics-derived data to improve workplace safety.

Each of the Group B modules play a critical role in the execution of Heavy Water Plants' operations. The failure to fully implement and utilise these modules not only resulted in the potential benefits of the ERP system not accruing to HWB but also resulted in continued exposure to operational risks that could have been mitigated through proper use of the system.

Further, during the test check at three selected Heavy Water Plants, Audit noticed that at Heavy Water Plant, Manuguru, all the documents related to stores and inventory were downloaded from IIS and then submitted as hard copies, rendering automation unfruitful. Following critically important plant functions continued to rely on manual reports and processes.

Table 21: Critically important plant functions still dealt with manually

Sl. No	Plant Functions
1.	Deficiency cum Safety Work Permit Requests
2.	Near-Miss Incidents Reports
3.	First Aid Injuries Report
4.	Onsite Emergency Exercises
5.	Preventive Maintenance
6.	Significant Event Reporting

HWB replied (April 2024) that all the modules of IIS are available in the production environment and the modules are ready to use. However, the mandatory use of IIS Software is being undertaken in a phased manner. For the Stores and Inventory module, the hard copy of the Requisition cum Issue Voucher is processed in parallel for the purpose of maintaining store records and updating the store's BIN card. As IIS is a new system, it has been designed with a role-based approval process and printing is not set as mandatory. Once IIS, including all its sub-modules, is fully matured, HWB will be positioned to achieve its goal of paperless operations.

The reply may be viewed in light of the fact that even after more than two years after the targeted Go-live date, the objectives of increasing the efficiency and effectiveness of plant operations, reducing of risk of errors and the overall goal of achieving streamlined and automated plant management had not been achieved.

Recommendation 20:

HWB should prioritise the full implementation, impart necessary training to users and mandate the utilisation of all Group B modules.

7.3.3.4 Deficiencies in the mapping of business rules and implementation of application controls

Audit examined the modules implemented and used by HWB and the sites and noticed the following deficiencies in the mapping of business rules and implementation of application controls in IIS.

i. Human resource management system and payroll

Sub-modules under this module addressed the human resource processes of the employees at HWB and Heavy Water Plants, including aspects such as recruitment, payroll, pension, leave, attendance, monitoring of hired or contractual staff, *etc.*

A. Time and Attendance Management System

The attendance data is basic information for other processes related to human resource management and establishment matters of the employees. Attendance Administrator was required to upload the text file exported from the Access Control System (ACS)[65], as per the prescribed format. From the User Manual for Time and Attendance Management System sub-module, Audit noticed that the data from this sub-module flowed to the other sub-modules such as Leave, PRIS[66], Payroll and Pension.

Proper installation and/or upgradation of compatible Access Control System at all eight sites was therefore required to be completed, in order to generate the text file for Time and Attendance Management System in the prescribed format.

Audit noticed that the Time and Attendance Management System sub-module was being used only at the HWB (Central Office), since the Access Control System had not yet been installed/ upgraded at the other seven sites, as of September 2023.

Since Time and Attendance Management System was not being used, Audit noticed that the sub-modules related to downward and sequentially dependent processes, such as Leave and Payroll, could not be utilised as intended with the attendance data flowing through IIS. Instead, the dependent data required for these processes from the attendance function were being handled manually, even after the implementation of IIS.

HWB accepted the Audit observation and stated (April 2024) that the provision to integrate Access Control System with Time and Attendance Management System had been implemented and had also been tested at HWB (Central Office). At the remaining seven sites, the task of integrating Access Control System with Time and Attendance Management System was in progress.

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[65] ***Electronic systems that allow authorised personnel to enter controlled, restricted or secure spaces by presenting an access credential.***

[66] ***Performance Related Incentive System.***

B. Sub-module - Recruitment

As per the User Requirement Specification for the Recruitment sub-module, integration of this sub-module with the MahaOnline portal[67] was essential as intended (User Requirement Specification) from the beginning of the Project, for online recruitment processes such as receiving online applications, processing the data of candidates and issue of call letters. After receipt of data from the Maha Online portal, this sub-module was intended to cover downstream dependent processes.

However, Audit noticed that this integration had not been implemented as of September 2023. Audit further noticed that in the absence of this integration, HWB had entered into a contract with M/s MeritTrac Services Pvt Ltd. in March 2021 for the development of a web application for pre-examination activities, conducting online examinations and for post-examination activities for recruitment of various posts.

Thus, despite the clear provision for the Recruitment sub-module in the User Requirement Specification in August 2018, HWB had to make alternate arrangements for the business processes related to this sub-module in the absence of integration with the Maha Online portal.

HWB accepted the absence of integration and stated that (April 2024) that this integration would be considered at a future date. The response indicated that the objective of covering business processes related to recruitment through IIS had not yet been achieved.

C. Sub-module - Employee Master and e-Service Book

A Service Book is a document to record all the events of a government servant in his/her entire service period. The rollout of Employee Master and e-Service Book (EMS) is a vital step towards establishing a fully automated Human Resource Management System (HRMS) which covers all employees of HWB across India (Central Office and Plants).

EMS Sub-module was intended to cover all the processes related to events over the employee lifecycle, from 'hiring to retiring'. EMS was intended to facilitate data entry and maintenance of information of each employee, *viz*., personal details, current official role details, reporting hierarchy, CHSS, CGEGIS, DAEFRS[68], *etc.,* and for the flow of data for the lifecycle of employee-related processes.

Audit examination of the functionality of this EMS sub-module revealed the following deficiencies.

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[67] ***Maha Online portal has been developed by Government of Maharashtra and has the Online Recruitment feature – Maha Recruitment- to cater to recruitment related requirements of all Government offices.***

[68] ***CHSS- Contributory Health Services Scheme, CGEGIS- Central Government Employees Group Insurance Scheme, DAEFRS – DAE-Employees' Family Relief Scheme.***

a. There was an absence of workflows in the sub-module for validation of key data entered, such as date of birth, date of entry into service, number of family dependents, date of retirement, *etc.,* using a maker-checker model. As a result, the control of segregation of duties was not available in the system to verify and validate the correctness of data entry.

HWB stated (April 2024) that historical data had been entered into IIS during data migration and that subsequent updating of data is being carried out by authorised officials of the Administration Section, after verification with the underlying supporting documents.

The response was not tenable, since the sub-module was required to have workflows for the implementation of segregation of duties on the basis of the maker-checker model, in order to maintain a clear trail/responsibilities of user actions affecting sensitive data fields related to employees and fix responsibility in case of errors.

b. There was an absence of functionality for employees to request changes/updates to their data related to their personal details and service records in the system, on a self-service basis. In the absence of such functionality, employees had to submit applications requesting changes to the authorised officials through email or other channels outside IIS and could not track the status of such applications on IIS.

Also, in the absence of this functionality of self-service, Audit noticed that key data had not been entered into the system by the authorised users, since the system did not have application controls to mandate the entry of data like Aadhar number, employee photographs, educational qualifications, hometown, CGEGIS details, National Pension System nomination details and other key documents such as Caste Certificate, Medical Certificate, Disability Certificate, Character and Antecedents Verification Report, Oath of Secrecy and Family Declaration Form, *etc.*

c. There was no provision for workflow in the system for verification of qualifying service after completing 18 years of service and five years before retirement, as mandatorily required.

d. There is an absence of functionality to generate reports from the EMS sub-module by filtering by Section or Gender of employees. As a result, users had to download the employee data in MS Excel format and then manually generate the required reports.

In the absence of the above-mentioned functionalities in the EMS sub-module, the users were still dependent on the physical Service Books to record key events over the

employee lifecycle. Also, since sub-modules such as promotion, transfer and manpower planning were dependent on the data flow from the EMS sub-module, these dependent sub-modules could not be used as intended, due to the above deficiencies.

HWB stated (April 2024) that these sub-modules would be used in a phased manner and that changing over from physical Service Books to EMS on IIS would be implemented gradually and with due verification and validation.

D. Sub-module - Resignation/Retirement/Removal

As per Annexure B to MoA, IIS was required to have functionality related to processing employee resignation/retirement/removal.

However, Audit noticed that such functionality for submission of resignation/request for retirement by employees and for processing these events or for removal of employees had not been implemented.

In reply, HWB stated that as per the functional requirements, the EMS sub-module has provision to record data related to Resignation, Retirement and Removal.

The response was not tenable, since it indicated that IIS only had provision to manually record the dates and details of these events, which were processed outside the system, in the absence of workflows for actually processing these events through the system and updating the same on the EMS sub-module automatically on completion of such workflows.

E. Sub-module - Promotion

A promotion sub-module was developed for processing promotion and MACP[69] cases.

Audit noted that the functionality for several business processes had not been implemented as detailed in ***Annexure 34.*** Audit further noticed that 193 promotion cases had been processed by HWB outside the IIS, after the Go-live date for the system, due to the absence of these functionalities.

F. Sub-module - Transfer

This sub-module under the Human Resource module was developed to facilitate the submission of applications for transfer by employees, online approval of transfer applications and management of all transfers in the organisation.

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[69] ***Modified Assured Career Progression.***

Audit noticed that there was no provision for transferred employees to submit joining reports through IIS. Further, 102 transfer cases had been processed by HWB outside the IIS, after the Go-live date for the system.

HWB replied (April 2024) that IIS is being implemented in a phased manner.

The response was not tenable, since these functionalities were required to be implemented and used by the Go-live date but haven't been used as intended even after three years from the scheduled timeline.

G. Sub-module - Leave Travel Concession (LTC)

Audit examined this sub-module and noticed that key application controls to enforce the mapping of business rules had not been implemented. For instance, in violation of Rule 5 of CCS (LTC) Rules 1988, the system did not have controls to prevent change of declared hometown for employees more than once, the system did not have application controls to prevent the submission of applications for LTC for the 2018-2021 block year, even in the year 2024.

H. Sub-module - Tours

Audit examined this sub-module and noticed that key application controls to enforce the mapping of business rules had not been implemented. For instance, there were no application controls to correctly calculate Daily Allowance based on time and date of tour duration and there were no application controls to prevent the Departmental users from increasing or decreasing the amount sanctioned, compared to the claim amount.

I. Sub-module - Leave

Audit examined this sub-module and noticed that key application controls to enforce the mapping of business rules had not been implemented. For instance, there were no application controls to maintain the correct balance of leaves, with the balance of Earned Leaves (including industrial leave) exceeding 315 in 20 cases; mapping of employees to the leave sanctioning authority had not been implemented, resulting in the submission of leave applications to incorrect authorities by employees. This in turn created orphan leave records in the system since these leave applications were not acted upon; there were no application controls to dispose (either close the application in case leave had not been availed or deduct the leave balance in case leave had been availed) of all pending leave applications at the time of entering details of retirement of employees; there were no application controls to transfer all leave applications pending with the leave sanctioning authority to the successor, in case of transfers; and there was an absence of functionality in the system to take into account

the provision for round-the-clock shift staff at Heavy Water Plants, as their weekly off was different from the general shift staff.

In the absence of the above functionalities, Audit noticed that physical leave applications continued to be used and pending leave applications had been disposed of through the back end of IIS with the support of ECIL in December 2023.

Accepting the observation, HWB stated (April 2024) that functionality in the Leave sub-module would be enhanced.

J. Sub-module- Training

Training sub-module was required to maintain data pertaining to training programs attended by employees (such as name, topic, periods and agency that conducted the training).

MIS Reports were required to be generated on the number of training programs attended by individual employees, the list of employees who attended training programs on a particular topic, the number of employees trained during a particular period and the number of training programs conducted by a particular agency.

Functionalities for identification of training needs, budget proposals for internal and external training, designing of a training calendar, business processes for approval and feedback on training programs were required to be implemented.

Audit, however, noticed that several functionalities had not been implemented in IIS, like training needs analysis, budget proposals for internal/external training, MIS Reports for viewing expenditure statements, payment to training agency and receipt of fees in case of paid training programs, generation and communication of nomination of employees for training programs, *etc.*

Audit also noticed that only 25 nominations had been processed through IIS during the period from February to November 2022, out of a total of 145 employees who had undergone training during this period.

HWB stated that the above functionalities would be implemented subsequently when IIS modules were fully operational.

The response needs to be considered along with the fact that these functionalities had been specified in the User Requirement Specification and were required to be implemented by the Go-live date. As a result of the lack of functionalities, the objectives of implementing the Training sub-module in IIS had not yet been achieved.

K. Sub-module - Pay fixation

The pay fixation sub-module under the HR module was required to implement functionality for only the following two limited processes, *viz.,* filling up of pay fixation option form by employee and fixation of pay done by APO/AO-II (Estt.) based on the employee's submitted application.

Audit noticed that the User Requirement Specification did not specify the requirements for process controls in IIS for computation and fixation of pay in compliance with business rules, along with a workflow for approval by the competent authority of the system-generated pay fixation. Further, pay fixation processes on employees passing various examinations, stepping up of pay, *etc.,* (where the option form is not required to be submitted by employees) had not yet been implemented in the system.

HWB did not respond to the Audit observation.

L. Sub-module - General Provident Fund

Audit examined this sub-module and noticed that key application controls to enforce the mapping of business rules had not been implemented-

a. Validation controls to ensure that the share of nominees of the employees for the purpose of GPF added up to 100 *per cent* had not been implemented in IIS. The sum of shares of nominees was higher than 100 *per cent* in the case of 462 out of 868 employees who had registered nominations under this sub-module.

b. Master data for PF rates had not been mapped correctly into IIS, as a result of which the computation of interest on PF balance was incorrect for the employees, over the period from 2017-18 to 2021-22. This was a material and significant failure of controls in IIS and resulted in the system not being reliable for retrieving the correct PF balances of the employees and, hence, continued reliance on offline, manual processes.

HWB stated (April 2024) that the actual utilisation of this sub-module has only commenced from April 2022 and the sub-module still required further modification to map business rules related to the processing of advances/withdrawals and MIS Reports for Broadsheet/ Ledger.

M. Sub-module - Payroll

Audit examined this sub-module and noticed that key application controls to enforce the mapping of business rules had not been implemented-

a. Master data for Transport Allowance had not been correctly entered, based on the pay level of employees, disability/Divyang status of employees and the classification of the city as per DoE O.M. dated 7.7.2017.

b. Master data for Washing and Uniform Allowances had not been correctly entered after they had been subsumed into Dress Allowance. HWB stated (April 2024) that the requirement of computing the correct Dress Allowance was being handled through a manual process via a monthly upload facility.

c. Master data for Professional Tax rates had not been correctly entered, as per the Maharashtra State Tax on Professions, Trades, Callings and Employments (Amendment) Act, 2023.

HWB stated (April 2024) that the master data required for the correct computation of Professional Tax will be entered into IIS.

d. Master data for Professional Update Allowance had not been entered into IIS. Pay levels had not been mapped correctly as per the DoE OM dated 2 Nov 2017.

HWB stated (April 2024) that corrective action will be taken.

ii. Finance and Accounts

The Finance and Accounts module was required to have the functionality to handle business processes of HWB such as- Budget, Works contracts processing, Payment Accounting, Receipt accounting, Credit/debit scroll reconciliation, Transfer entries posting, Compilation of monthly accounts, Bank Guarantees, Earnest Money Deposits and Security Deposits and Ledger and Broadsheet maintained by the Accounts section.

A. Sub-modules not implemented under the Finance and Accounts module

There were 13 sub-modules that had not been implemented at HWB Central Office or any of its sites. The names and reasons for the non-implementation of these 13 sub-modules under Finance and Accounts have been detailed in ***Annexure 35.***

HWB stated (April 2024) that sub-modules whose functionalities were not covered by PFMS would be implemented and utilised.

The response indicated that key sub-modules such as Tender Processing, Works and Contracts Payment, Contingency Payment and Ledger/Broadsheets had not been utilised as intended

and hence, the objectives of implementing IIS for these functionalities had not yet been achieved.

B. Budget

Sub-modules under the Finance and Accounts module shall facilitate budget requirements, anticipated expenditure, revised estimates, *etc.*, and generate reports. The master directory shall maintain various codes forming the basic information, including account heads, which are to be maintained for every financial year.

Audit noticed that the major and minor heads, as amended by Controller General of Accounts *vide* O.M. dated 15.12.2022, had not been correctly mapped into IIS. It was further noted that the master data for recording details of the financial year (1 April to 31 March) had not been correctly entered into IIS, with data for BE 2020-2021, BE 2019-2020, BE 2021-2022 and RE 2022 entered with incorrect start and end dates for the financial year.

HWB stated (April 2024) that since budget data was entered into PFMS and then submitted to the Department of Atomic Energy, these errors had been rectified during that manual process.

The response needs to be viewed along with the fact that, since the data entered on IIS was incorrect and indicated that continued use of manual intervention to ensure compliance and correct budget process was necessitated despite the implementation of IIS.

C. Absence of integration with GeM

Office memoranda dated 30 March 2012, 9 January 2014 and 21 January 2016 and other OMs issued by the Department of Expenditure, Ministry of Finance mandates all Ministries/ Department of Central Government their attached and subordinated offices to commence e-Procurement in respect of all procurements with estimated value of ₹2 lakh or above w.e.f. 1 April 2016 by selecting e-Procurement service provider of their own choice. Government e-Marketplace (GeM) is the Public Procurement Portal for the procurement of goods and services for all Central Government and State Government Ministries, Departments, Public Sector Units (PSUs) and affiliated. GeM endeavours to make public procurement processes transparent, efficient and inclusive. The purchases through GeM by Government users have been authorised and made mandatory by the Ministry of Finance by adding a new Rule No. 149 in the General Financial Rules, 2017.

Audit examined the User Requirement Specification for Finance and Accounts - Tender Processing sub-module (TPS) and noticed that the requirement for integration of IIS with GeM

to transmit data on sanction orders, Bill of Quantity for procurement and other pre-tender stage data from IIS to GeM and transmission of data on the award of contracts from GeM to IIS had not been specified. Processes such as publishing of Notice Inviting Tender in Newspapers, opening of bids (Technical/Commercial), preparation of tender Opening sheet, issuing of Letter of Intent/Work Order by the Competent Authority, etc., which were already mapped in GeM, were duplicated in IIS. Audit concluded that HWB would not be in a position to register itself on GeM and use that portal, in case all these processes were intended to be carried out in IIS only.

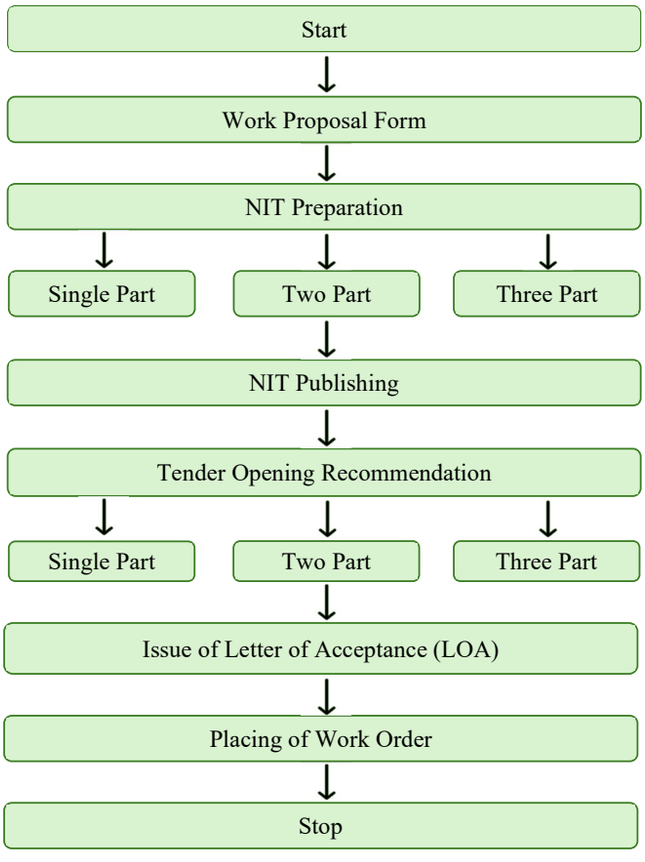

Figure 9: Process flow of Tender Processing Sub-module

HWB stated (April 2024) that GeM is an independent portal developed by the Government of India and is not under the control of HWB and hence, cannot be integrated with IIS.

The reply was not tenable, since the GeM portal specifically supports the integration of different ERP systems of government organisations through Application Programming Interfaces and the utilisation of GeM for the procurement process for contracts with a value above the defined threshold was mandatory, for the purpose of maintaining a holistic view of procurement carried out across the whole of Government.

D. Absence of Integration with Public Finance Management System

GoI launched the Public Financial Management System (PFMS) in April 2008 aimed at establishing a suitable online Management Information System (MIS) and Decision Support System for fund management of the schemes of the GoI. PFMS system *inter alia* envisages tracking of disbursement and utilisation of GoI funds under various schemes on a real-time basis.

Audit noticed that since 2021, the Public Finance Management System had been introduced in HWB for the creation of sanctions and passing of bills. However, there was no integration

planned between IIS and PFMS for the exchange of data such as sanction orders, receipt of funds and expenditures. HWB was utilising PFMS to submit reports such as monthly accounts to DAE, through manual processes for data entry, even though its own IIS already would have such data and should have only been transmitted to PFMS.

In addition, key functionalities such as preparation and compilation of the budget, bill preparation and passing of bills, making payments towards works and contracts, maintenance of cash book, *etc.,* were being processed through PFMS, with no integration or updation of data related to these functions on IIS. As a result, the related sub-modules under the Finance and Accounts module remained unutilised at HWB and the IIS database remained incomplete, even though it was the ERP system for the organisation.

HWB stated (April 2024) that PFMS was an independent application developed by the Government of India and was not under the control of HWB; hence, integration with IIS was not possible.

The response was not tenable, since PFMS specifically supports integration with other applications through Application Programming Interfaces (APIs) and in the absence of such integration, IIS would not be able to function as a complete ERP for HWB.

iii. Project Monitoring and Reporting

Project Monitoring and Reporting Module of IIS is developed based on the requirements given by the project group, which includes updating the physical progress by project executing authority and financial updates by accounts officials through the accounts module. Updating the constraints for the execution of the project and making budget provisions (Budget Estimate, Revised Estimate and Final Requirement), *etc.*

a. Functioning under the Project Monitoring System module can only be started after getting all the approvals for the project from the competent authorities outside IIS. No approving channel has been mapped in IIS for getting recommendations/approval from the Board of Management, HoD, DAE, *etc.,* (other than the reviewing authorities), except for the process of uploading the copies of the approvals taken outside IIS.

b. Functionalities for getting approval from the competent authorities (other than the reviewing authorities) for closing after completion of the project and generating completion certificates have not been mapped.

c. The Project Monitoring System module is able to generate only reports related to Project monthly progress, Project quarterly physical progress, Project quarterly financial progress, Work order quarterly progress and Fortnightly report. But, the provision for

generating yearly budget information of the concerned User Requirement Specification has not been automated.

d. The processes for generating Utilisation Certificates, Debriefing Reports, *etc.,* under a project have not been incorporated.

e. Approval for short closure or drop of the project from the competent authority (other than reviewing authority) was not possible to process through IIS.

f. The process of preparation and finalisation of the Outcome Budget has not been automated through the system.

g. Though PMS has been integrated into the Finance and Accounts module, seamless integration with the Finance and Accounts module could not be ascertained due to the non-implementation of sub-modules under the Finance and Accounts module.

h. The system is not able to process MoUs under a project.

i. The details of Purchase Order/Work Order/MOUs-wise payments made and the reflection of the availability of funds under a project cannot be viewed in this module.

j. Though IIS can add projects, sub-projects and activities along with milestones, however, no provision for adding new proposals has been incorporated in the IIS itself.

Confirming the Audit observation, the HWB stated (April 2024) that the provision can be continued. However, once the approval for a new proposal is obtained from the competent authority outside the IIS platform separately, the project coordinator can modify the sub-project/proposal, milestones or activities after the project group unlocks the provision. Once it is locked again by the project coordinator, no further changes can be made to the project details.

k. No automation related to details of manpower required/utilised under a project has also been mapped.

l. There is no provision in IIS to add/update the achievement/non-achievement (along with detailed justification) of the objectives/milestones under a project. Therefore, for getting approval from DAE or any other authority (other than the reviewing authority) for the completion of the project, the desired information needs to be prepared separately and sent to the competent authority outside IIS.

m. There is no mapping in IIS to generate communication letters when required to communicate at any level regarding the project.

In February 2024, HWB stated that since the integration of inter-departmental inputs was complex and getting streamlined, the older method of project status monitoring and reporting (physical and financial) on a monthly, quarterly and yearly basis was continued.

While the Project Monitoring and Reporting module was being developed, all the Capital projects of HWB were under various stages of execution. Though the project's financial sanction details were added in the Project Monitoring and Reporting module, updating the project status was not taken up by coordinators, with a view that balance details would be updated in due course. Also, a few projects are on the verge of closure/completion and simultaneously, three projects are in the advanced stage of getting DAE financial sanction.

Though the project coordinator could update the physical progress of the project through the Project Monitoring and Reporting module, financial progress, *i.e.*, expenditure for various work orders/purchase orders, could not be updated in the Project Monitoring and Reporting module through the Finance and Accounts module.

In view of the above, HWB felt prudent to use the Project Monitoring and Reporting module of IIS from April 2024, *i.e.,* more than three years of the completion of the project.

While admitting the observation, HWB stated (April 2024) that all the reports as envisaged can be generated from the module once all the projects are updated in the Project Monitoring and Reporting module, which is likely to be achieved by Quarter-1 of FY 2024-25 onwards.

Recommendation 21:

HWB should implement application controls in IIS to enforce the business rules for various sub-modules under both Group A and Group B modules.

Recommendation 22:

HWB should review the list of sub-modules not yet implemented under the Group A modules and obtain necessary approval from the Competent Authority in case any of the sub-modules are no longer required.

7.3.3.5 Additional features of Detailed Project Report not envisaged

Over the years, there was a requirement for modifications in the system for additional features like Bi-lingual support, Centralised IIS, Web-based applications and integration into the DAE Integrated Management Information System (DIMIS), *etc.* In view of this, HWB decided to develop a new IIS System to meet the challenges and demands mentioned above.

Audit examination revealed that some of the required additional features were not incorporated into the system. The details are given below.

a. Several views were created in the backend database of IIS as per the information desired by DAE with respect to human resource management for the DIMIS application and after exporting from the backend database in.csv or in any required format, the same were sent to DAE through the concerned section of HWB. Even though front-end forms for the required data/reports related to DIMIS were available, no mapping for integration of DIMIS with IIS had been planned. Therefore, this basic need to incorporate additional features of integration into DIMIS could not be met by the project.

In this connection, HWB replied that as per Clause 1.9 (xvi) of Annexure B of MoA, the IIS system should be able to generate data or report in the required format for export or import to different systems like DIMIS. Data/report generation for DIMIS in the required format of DAE is achieved through IIS. The reply is not tenable, since integration with DIMIS was necessary but has not been implemented.

HWB didn't offer any specific comment in this regard.

b. IIS should be enabled to support bi-lingual, incorporating Hindi (Rajbhasha) as per the order of GoI. Although HWB (Central Office) replied that the feature was added, neither was there any language change option available to change the language of the page to Hindi, nor were all the reports, letters and orders generated from IIS in Hindi/ bilingual.

HWB replied (April 2024) that IIS supports bilingual features. In some forms, captions are marked bilingual. IIS Forms Fields supports the entry of data in bilingual. There is no need to change the language option for bilinguals in IIS. Users need to change the font type in the system and then use the Hindi keyboard for entering/updating data in Hindi.

The reply of HWB is not tenable as the field names of the IIS form in the web interface were not in bilingual format. Even the reports generated/downloaded from the system could be in English only. Only the input fields supported the Hindi script if the user selected the Hindi keyboard during data entry. Therefore, although IIS supports bilingual features, the systems were not designed for compliance with the Hindi Rajbhasha rules.

c. Functionality for system-generated email and SMS alerts had not been implemented. Email alert features of IIS were tested, but had not been deployed on the production server. As per HWB, for each recommendation or approval, an email would be generated and this may create inconvenience to email users. Hence, HWB planned to activate email only for specific functionalities.

d. Though integration with Audio-visual alerts was an additional requirement for revamping IIS, the same was not incorporated, stating only that the same was not envisaged in MoA.

e. Mapping/Chart had not been prepared to compare the functionalities covered by the older version of IIS and the newer version of IIS, to derive assurance that the newer version actually covered more use cases for the business requirements of HWB.

HWB only stated (April 2024) that due to the incorporation of new technologies with respect to software and hardware, the newer version of IIS had advantages over the older version. While this response addressed the risk of technological obsolescence, it did not address the risk of gaps in functionality delivered by the newer version of IIS.

HWB needed to take action to incorporate additional features that were required to meet the business functions of the organisation.

7.3.3.6 Absence of Digital Signatures and Multi-Factor Authentication

According to Detailed Project Report on IT infrastructure and application software revamping at HWB/Heavy Water Plants, it was proposed to build up the new application software (IIS new) using Open-Source tools like Java and MySQL/PostGreSQL so that excessive dependence on software developers may be avoided and recurring expenditure on future up-gradations may be reduced. Additionally, the software shall have the following features-

1. Web-enabled interface
2. Bilingual support (both at data and label level)
3. Integrated Workflow Management
4. Email/SMS Alerts for pending/completed transactions.
5. Screen Layouts to be identical to the manual forms
6. *Ad-hoc* queries and reports generation
7. Implementation of Paperless office
8. Digital Signature Interface/Support
9. Modular Architecture with high Scalability
10. Dynamic Role Management
11. Automated Backup and Retrieval of Data

12. Seamless Integration of data across the sites
13. Cross Platform Compatibility
14. Parameterised Coding of Logic
15. Integrated Document Management

However, Audit observed that functionality for Digital Signatures had not been implemented in the system.

During the test check of the status of implementation at three Heavy Water Plants, Audit noticed that at Heavy Water Plant, Manuguru, documents related to stores were required to be downloaded from IIS and then submitted as hard copies. One of the reasons for continuing with manual, offline processing of these documents was the absence of functionality for Digital Signatures to identify the employees who had created and approved the documents in the system. The lack of Digital Signature functionality in line with Detailed Project Report specifications highlights a deviation from planned system enhancements, potentially impeding operational efficiency and data security.

Audit also noticed that Multi-Factor Authentication of users with One Time Passwords (OTPs) sent to email ID/mobile numbers of users during the initial registration or subsequent login attempts had not been implemented. The absence of Multi-Factor Authentication through OTPs was a significant control deficiency and created the avoidable risks associated with users sharing/misusing passwords and thereby gaining unauthorised access to information, thereby impacting the confidentiality and integrity of data.

While accepting the observation, HWB stated (April 2024) that the use of Digital Signatures and Multi-Factor Authentication had not been envisaged. However, the system is compatible with future implementation of these functionalities and they would be implemented as and when required.

7.3.4 Efficiency and reliability

Efficiency and reliability are two critical pillars of any IT application system. Efficiency refers to the ability of an IT application to utilise resources optimally while achieving desired outputs. Reliability refers to the consistency and dependability of an IT application in delivering its intended functionality.

Audit examined the modules of IIS with respect to these two aspects and the observations are described in the following paras.

7.3.4.1 Modification of source code directly in the production environment, without documented testing process

Audit observed that during the period from October 2021 to September 2023, modifications to the source code of IIS were directly implemented by HWB on the production server on three occasions.

This created a significant risk for the reliability of the application, since even in case of minor modifications, there was the probability of introduction of errors such as inadvertent creation of infinite loops and unforeseen consumption of system resources such as storage and computation power. Such errors could have a disproportionate impact on the production environment, with the risk of significant disruptions, data loss or introduction of security vulnerabilities. All modifications to the source code should be carried out with adequate documentation in a test environment with rigorous integration and regression tests and only then introduced into the production environment, to mitigate against this risk.

HWB responded that (April 2024) the Audit observation had been noted and that direct modifications to the source code in the production environment would not be done henceforth.

7.3.4.2 Deficiencies in User Access Management

User access management is the process of controlling and monitoring user permissions within a system to ensure that individuals have the appropriate level of access based on their roles, safeguarding sensitive information and preventing unauthorised access. The following deficiencies were identified in the user access management process.

i. The process of password recovery/reset in IIS requires users to enter their employee ID and answer a security question which then generates/displays an OTP on screen (same page) which users need to fill in to reset their password. Audit observed that users are presented with a security question on the reset page, which is automatically populated with the question they had previously answered during the signup process. Further, when users provide multiple incorrect answers to the security question, there is no lockout mechanism in place. Audit also observed that there were no limitations on number of attempts to answer the security questions and that the security questions were too generic ('What is your favourite colour?'). HWB replied (April 2024) that the Audit observation would be analysed and efforts shall be made to improve the system as part of continual improvements.

ii. The system allows users to submit their current password as the new password for their account. There is no validation in place to ensure that the new password is distinct from the current one. There is no validation control to prevent password recycling. HWB while

accepting the observation, replied (April 2024) that the recommendations for a strict password change policy will be taken up by HWB in the near future on priority as a part of continual improvements.

iii. Audit observed that 588 users had not changed their passwords since 2020, 699 users since 2021 and 699 users since 2022. This indicates that the system lacks a mechanism to prompt users for periodic password changes, raising concerns about the security of user accounts. HWB while accepting the observation, replied (April 2024) that the recommendations for implementation of the Password Aging Policy will be taken up by HWB in the near future on priority as a part of continual improvements.

iv. Audit observed that user-specific information, *i.e.,* security questions and answers, is exposed in URLs when users navigate to the update security question page. This exposure makes sensitive account information accessible within the intranet environment, potentially leading to unauthorised access and compromised user accounts. HWB replied (April 2024) that the issue will be analysed in detail and necessary action will be taken for improvements of more stringent security measures in IIS in terms of Data exposure in URLs related to user accounts.

v. Audit observed that users could escalate their privileges within the IIS by copying and pasting or directly typing URLs to access functionalities beyond their designated privileges. For instance, a non-Single Sign On admin user could access sensitive information by copying and pasting the URL of the 'Site employee security Question and Answer' page, revealing all the users' security answers. Similarly, copying and pasting the URL of the other Single Sign On admin privilege page allowed unauthorised users to gain control over all crucial system privileges of Single Sign On admin functions-

- The ability to add and register sub-module applications within the integrated system,
- Control over site administration management,
- Single Sign On administration management,
- Access to view One-Time Passwords generated for IIS users,
- Control over master settings including header images, sub-module master, session timeout, failed login attempts, security question master and the ability to clear cache from the Single Sign On homepage and create main menu/sub-menu,
- Monitoring functionalities such as active sessions, active modules, active modules history and active session history for system auditing,

- The ability to access and view all questions and answers in the site's employee security Q and A section.

This was a major control failure. Accepting the audit observation, HWB (April 2024) has already initiated the necessary corrective action for improvement in functionality of Single Sign On access on priority.

Recommendation 23:

HWB should adopt key general controls such as Single Sign On admin functions. Version Control System, maintenance of Test Reports, formal Change Management, Digital Signatures, Multi-Factor Authentication, Password Policy for users, Access Management for privileged users and MIS Reports as specified in the MoA.

7.3.4.3 Continued use of the older version of IIS

For the purpose of efficiency in the utilisation of resources, it was vital that after the Go-live date for the newer version of IIS, the utilisation of the older version of IIS would cease. This would ensure that duplication of work and entry of the same data into the two applications was avoided.

Audit noticed that even after the Go-live date for the newer version of IIS in October 2021, Heavy Water Plant Kota continued to use the older version of IIS, even as of December 2023 in addition to the newer version.

This resulted in parallel and duplicate work at the Heavy Water Plants and lowered the efficiency of the use of the application. Audit noticed that HWB Central Office had not issued clear instructions regarding the discontinuation of the utilisation of the older version with specific timelines for that purpose.

HWB stated (April 2024) that the organisation was in transition from switching over from the older version to the newer version of IIS and that no support was intended to be extended for the older version.

The response was not tenable, since no specific steps had been taken to define a clear timeline for the mandatory and exclusive utilisation of the newer version of IIS.

Recommendation 24:

HWB should plan for phased retirement of the older version of IIS, to ensure consistency and functioning of the newer version of IIS as the single source of truth and single ERP for the organisation.

7.3.4.4 Non-achievement of paper-less Offices in HWB

IIS aimed to establish the system for MIS to achieve paperless offices in HWB and Heavy Water Plants and thereby improve the efficiency of operations.

Audit reviewed the circulars issued by various Plants and noticed that employees had been instructed to submit various applications or returns through IIS along with a printed hard copy of the same, even after the Go-live date for the newer version of the application.

HWB stated that once all the modules and sub-modules were utilised as intended and the utilisation entered a maturity phase, HWB would be able to achieve the objective of paperless Offices.

Thus, the fact remains that even after the passage of more than three years since the completion of the project, HWB could not fulfil one of the objectives of revamping the new IIS.

7.3.5 Conclusion

The Group B modules of IIS cover the core business/operational functions of HWB and Heavy Water Plants. These modules cover the essential functions- plant status reporting, maintenance management, stores and inventory management and purchase and safety event reporting. These modules had not been utilised by HWB and Heavy Water Plants as of September 2023, more than two years after the scheduled Go-live Date for the newer version of IIS. This indicated that the main objectives of implementing IIS had not yet been achieved and that HWB continued to rely on the older version of IIS as well as manual processes to meet its business requirements, which carried the associated risks of errors related to completeness and correctness.

The Group A modules of IIS cover the supporting business functions of HWB and Heavy Water Plants. These modules cover functions such as HR and payroll, Finance and Accounts and Project Monitoring and Reporting. These modules have been partially implemented and utilised. In the case of the utilised modules, there remain significant material deficiencies in the functionalities and application controls implemented.

The Governance Committees constituted to monitor the progress of implementation of IIS have not reviewed the status of the Group A and the Group B modules, which have either not yet been implemented or have not yet been utilised, at periodic intervals and have not adopted clear revised timelines for the implementation and utilisation. There were also

deficiencies in the preparation of User Requirement Specification, mapping of business rules, implementation of application controls, monitoring of IIS implementation and preparation of MIS reports for IIS and information security. Additionally, there was a lack of preparation for testing reports, an absence of a version control system and no release plan. Further, the continued use of the old IIS poses risks to the system's effectiveness, security and overall operational reliability.

Without the full implementation and utilisation of the full list of modules, HWB cannot realise the full benefits of the IIS. Due to the non-utilisation of Group B modules, key objectives such as enhancing operational efficiency, reducing manual interventions and ensuring data integrity were not achieved. There is a substantial gap between the intended benefits of the IIS and the actual outcomes observed in the current implementation.

As Group B modules are intended for use in the day-to-day operations of Heavy Water Plants, their lack of utilisation has undermined the core objectives of the ERP implementation and delayed the achievement of a fully automated and integrated system.

7.4 Subject Specific Compliance Audit of activities of Board of Radiation and Isotope Technology

7.4.1 Introduction

Board of Radiation and Isotope Technology (BRIT) is an Industrial Unit of Department of Atomic Energy, Government of India. BRIT provides a broad portfolio of products in the form of Radiopharmaceuticals, Labelled Compounds and Nucleotides, Sealed Radiation Sources, Gamma Chambers, Blood Irradiators and Radiography Exposure Devices. These products are developed through projects undertaken at BRIT Headquarters in Mumbai and its six regional Centres located at Bengaluru, Delhi, Dibrugarh, Hyderabad, Kolkata and Kota. It also offers Isotope Application services, Radio analytical services, Calibration and Dosimetry services and Radiation Processing Services, besides Project Consultancy services for setting up Radiation Processing Plants in the private sector.

As of March 2024, BRIT had 502 sanctioned posts, of which 387 were for Scientific and Technical Personnel and 115 Administrative Personnel. As against this, 272 Scientific and Technical Personnel and 81 Administrative Personnel were in place. The total expenditure of BRIT during 2018-19 to 2023-24 ranged from ₹90.90 crore to ₹207.46 crore.

7.4.2 Financial Performance

7.4.2.1 Budget and Expenditure

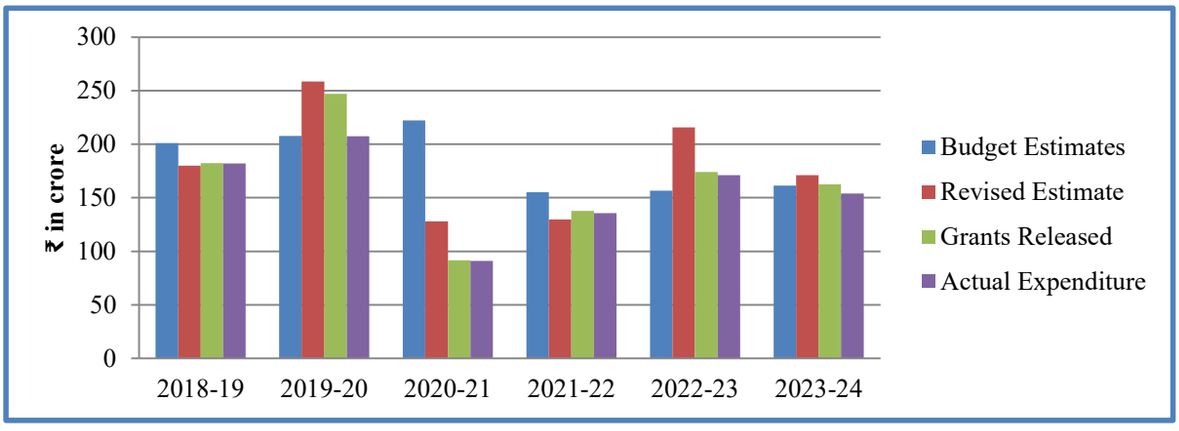

Figure 10: Details of Budget Estimates, Revised Estimates, Grants Released and Actual Expenditure of BRIT for the last six years

Actual expenditure of BRIT, which was growing pre-COVID-19, saw a sharp decline from ₹207.46 crore in 2019-20 to ₹90.9 crore in 2020-21. After COVID-19, normal operations of BRIT started to resume and year wise actual expenditure also picked up to reach ₹171.01 crore in the financial year 2022-23. Actual Expenditure dropped to ₹154.03 crore in the year 2023-24.

7.4.2.2 Revenue Generation

The year wise details of actual revenue generation against the target fixed by the BRIT Board for last 11 years are given below.

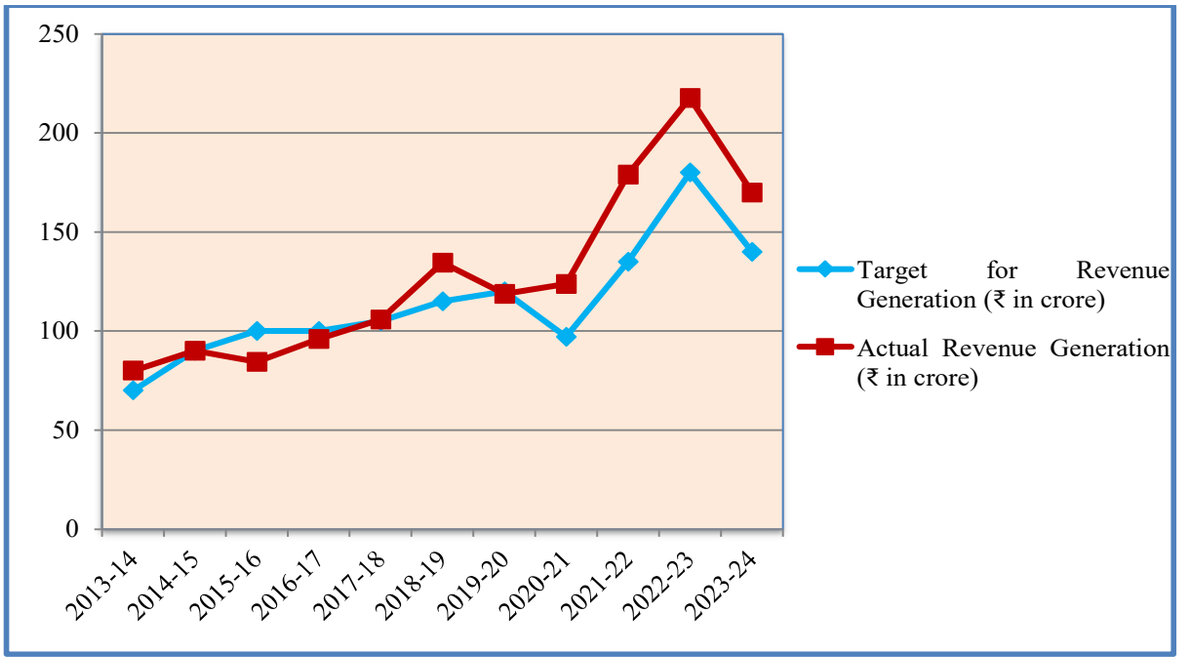

Figure 11: Year wise details of actual revenue generation

BRIT has nearly doubled its actual revenue generation from ₹123.73 crore to ₹217.7 crore in the year 2022-23 because of an increase in sales of Radiopharmaceuticals and Labelled Compounds from ₹31.34 crore to ₹62 crore and Engineering and Radiation Technology Equipment from ₹77.04 crore to ₹132.66 crore. The actual revenue generation, however, fell to ₹169.93 crore in the year 2023-24.

7.4.3 Scope of Audit, sample size and audit methodology

Audit examined projects completed during the period 2018-19 to 2022-23 and ongoing projects as of August 2024 in order to evaluate effective execution and achievement of objectives of the projects[70]. The scope of Audit further included examination of utilisation of plant capacity, services provided to society/customers, outstanding dues, status of proforma accounts, internal controls and records of four regional centres[71]. The Entry Conference with BRIT was held on 23 May 2023 and the Exit Conference was held on 31 October 2023.

7.4.4 Audit findings

The audit findings have been categorised into three parts, *viz*., (i) Project Management (ii) Financial Management and (iii) Internal control. The findings under each category have been discussed in the ensuing paras.

7.4.4.1 Project Management

BRIT and its six regional centres are focused on bringing the benefits of the use of radioisotope applications and radiation technology across the Industry, Healthcare, Research and Agricultural sectors of society.

BRIT executed 10 projects **(*Annexure 36*)** during the period 2003-04 to 2023-24. These projects were either completed or ongoing during the audit period (2018-19 to 2022-23). The revised/sanctioned cost of the projects was ₹738.79 crore, against which an expenditure of ₹422.58 crore (57.19 *per cent)* was incurred up to August 2024. Of these 10 projects, five were completed and five were ongoing as of August 2025.

Audit noticed (June 2023) that of the 10 projects, nine were related to Healthcare and one was related to Agriculture. Further, BRIT has not executed any project under the sectors of Research and Industry since its inception, though this is one of its mandates. Hence, BRIT focused its efforts on a limited area of radioisotope application.

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[70] ***Except one project titled 'Indigenous High Dose Rate Brachytherapy Equipment (IHDR)' which appeared in the CAG Audit Report No. 24 of 2023.***

[71] ***Kota, Kolkata, Bangalore and Hyderabad.***

i. Time and cost overrun in projects

Audit observed that BRIT did not meet the timelines for completion of the project in seven out of 10 projects and observed time overruns ranging from three months to 204 months as of August 2024.

Out of the seven projects stated above, the sanctioned cost of three projects exceeded the original approved cost ranging from ₹1.60 crore and ₹186.20 crore as of August 2024. The details of the time overrun and cost overrun of all ten projects are detailed in ***Annexure 36.***

ii. Poor monitoring

Monitoring is an essential activity for tracking the Mission progress against set goals, identifying the potential issues early on, making necessary adjustments to stay on track and ensuring the result delivery on time within budget and within the defined scope. Audit noted issues related to monitoring of activities undertaken by BRIT and its Regional Centers as detailed in the ensuing paras.

a) Delay in formulation of policy/guidelines for disposal of decayed/unused radiation sources

As per Rule 34 of Atomic Energy (Radiation Protection) Rules, 2004, 'when a radiation installation or radiation generating equipment ceases to be in use, the employer shall ensure its decommissioning.'

The Atomic Energy Regulatory Board, during its inspection (November 2022), observed that spent Co-60 pencils and spent Ir-192 sources were stored in containers and were pending disposal. AERB also observed that BRIT did not devise any policy for the disposal of these sources. Atomic Energy Regulatory Board recommended (December 2022) that BRIT should have a set policy for disposal of the spent sources. In response, BRIT intimated (January 2023) that expected date of compliance would be March 2023. However, BRIT further stated (September 2024) that the General policy on the disposal of decayed/disused radioactive sources is not yet finalised/approved by the Department of Atomic Energy. Once the Department of Atomic Energy finalises the policy, the same will be implemented in BRIT.

Thus, though Atomic Energy (Radiation Protection) Rules were framed way back in 2004, General policy on the disposal of decayed/disused radioactive sources has not yet been finalised/ approved by DAE, even after more than 20 years.

Recommendation 25:

Department of Atomic Energy/BRIT may bring out a policy at the earliest for the proper disposal of decayed/disused radioactive sources.

b) Storage of huge quantities of radioactive waste

As per Section 2.2.9 of Atomic Energy Regulatory Board/Safety Guidelines/O-5 (August 1998), 'the Plant Management shall arrange for proper collection, storage, handling and disposal of the wastes that are generated in the plant as per approved procedures.'

In its inspection report (November 2022), the Atomic Energy Regulatory Board pointed out that storage of a large amount of highly radioactive waste in the storage pool of Rajasthan Atomic Power Project Cobalt Facility, Rajasthan Reactor site. In response, Rajasthan Atomic Power Project Cobalt Facility (January 2023) stated that all the highly radioactive waste generated at the facility is disposed of at the Centralised Waste Management Facility, Rajasthan Reactor Site. Due to the non-availability of a crane at the Centralised Waste Management Facility, waste was not disposed of on time and will be done in line with favourable conditions at the Centralised Waste Management Facility, Rajasthan Reactor site.

Audit observed that even though storage of radioactive waste in the storage pool was pointed out by the Atomic Energy Regulatory Board in November 2022, the total accumulated quantity of radioactive waste had increased to 231 in number (March 2025) from 180 (November 2022).

BRIT replied (October 2023) that large quantity of Co-60 is being processed throughout the year at Rajasthan Atomic Power Project Cobalt Facility. Disposal of solid waste is being done in coordination with Rajasthan Reactor site.

The fact remains that despite the accumulation of a huge quantity of radioactive waste, the same was still lying in stores of the Regional Centre, Kota, till date (September 2024) despite having guidelines in this regard since 1998.

c) Inordinate delay in setting up and operating the Radio Analytical Laboratory

BRIT approved the setting up of 'Radio Analytical Laboratory' for testing of food items at the Regional Centre, Hyderabad during 2012-13. Audit observed that all the equipment was procured at a cost of ₹0.20 crore during the period between January 2013 and April 2023 for setting up the said facility.

Despite procuring the above equipment, accreditation of the National Accreditation Board for Testing and Calibration Laboratory was still pending and the facility could not achieve the desired objective till date (September 2024). Besides, some of the procured items were lying idle since their receipt.

BRIT stated (September 2024) that National Accreditation Board for Testing and Calibration Laboratory's accreditation was required for routine Radio Analytical Laboratory sample analysis and the same is in process.

Reply may be viewed in the light of the fact that the requirement of accreditation was well known, the purchase of the equipment itself took 10 years and the accreditation of the laboratory is still pending, due to the lack of monitoring and timely pursuance by BRIT.

d) Meetings not conducted as per the approved periodicity

BRIT had constituted various committees with specific purposes to assist the Chief Executive on various matters related to the smooth functioning of the office.

Nine Committees, *viz.,* the BRIT Board, six Safety Committees, Performance Review Committee and Regional Council which were responsible for overall oversight, governance, performance and safety of operations, were expected to meet at a prescribed periodicity for effective discharge of their mandate. Audit observed that the frequency of meetings of these Committees was less than the approved periodicity. The details of shortfalls in the conduct of meetings are given in ***Annexure 37***.

Further, out of the nine committees, there were shortfalls in the number of meetings in respect of three committees by more than 50 *per cent* of its approved periodicity during the period 2018-2024. Audit observed that the BRIT Board, the apex body in BRIT, which is responsible for planning and implementation of the various programmes executed by BRIT, met only 14 times out of 24 quarterly meetings, contravening the provisions of the Department of Atomic Energy Office Memorandum (August 1999).

Such gaps in meetings of committees which are mandated to oversee the functioning of BRIT, defeat the purpose of their constitution. The gaps in oversight and guidance, particularly from BRIT Board and Performance Review Committees and in maintaining the rigor of functioning of the organisation have manifested in the pervasive delays in completion of projects and a casual approach to achieving objectives that are affected by dynamic market conditions and research efforts at global level.

BRIT accepted the audit observation and stated (July 2023) that the periodicity of the BRIT Board could not be maintained as per the Terms of Reference of the BRIT Board's constitution

order. It was further added that as the Board consists of very senior officials of the Department of Atomic Energy, the meeting is arranged only when there are agendas for discussion in the Board.

The reply may be viewed in the light of the fact that BRIT failed to adhere to the Constitution Orders of BRIT Board stipulating quarterly meetings for periodical review of progress of projects, schemes, *etc.*

e) Issues in monitoring of Project execution

BRIT constituted the Performance Review Committee (PRC) in December 2020, which comprised of Chief Executive (BRIT) as Chairman and General Managers, Deputy General Managers of concerned sections as its members. PRC is mandated to review the performance of Groups/Divisions involved in Production, Sales and Project activities quarterly. The PRC was envisaged to critically examine and review achievement of physical and financial targets, action taken on recommendations of Committee during previous meetings, internal/external bottlenecks and matters requiring attention of BRIT Management Committee and BRIT Board. Prior to constitution of PRC[72], no robust mechanism existed in BRIT to monitor/review the progress of the projects in a timely manner.

As mentioned in the above para, PRC did not conduct its meetings regularly as mandated. Against the prescribed nine meetings, PRC could meet only six times during 2020-21 to 2022-23. Further, in the year 2023-24, PRC remained inactive and no meeting was conducted.

Due to poor and irregular monitoring, there were no course corrections, remedial actions with respect to delays, cost overrun and non-achievement of the objectives intended for the projects undertaken by BRIT and its regional centers. The same are discussed in *paras 7.4.4.2* and *7.4.4.3* subsequently.

BRIT stated (September 2024) that a monthly review of projects was carried out and status reports were submitted to the Department of Atomic Energy, however, the formal minutes have not been prepared. In the absence of documentation of the proceedings of the monthly review exercise, Audit could not ascertain the effectiveness of monthly review of projects.

The reply may be viewed in the light of the fact that alternate mechanism developed by BRIT is not effective since it only sends monthly status reports of projects to the Department of Atomic Energy and it did not review/monitor/supervise and scrutinise the execution of projects for timely intervention to avoid delays, cost overruns, *etc.*

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[72] ***Project Implementation Committee was constituted in December 2016 to oversee only Fission Moly Project.***

Recommendation 26:

BRIT may adhere to the timelines prescribed for conducting meetings of its various committees so that corrective actions on its projects/activities can be taken in a timely manner.

Project wise findings have been discussed below.

7.4.4.2 Completed Projects

Audit observed that as of August 2024, out of 10 Projects undertaken by BRIT, three projects were completed during the period 2018-19 to 2023-24. The audit findings related to these three projects are given below.

i. Project titled 'Department of Atomic Energy Medical Cyclotron Project at Kolkata'

Department of Atomic Energy sanctioned (January 2004) a project titled 'Department of Atomic Energy Medical Cyclotron Project' at Kolkata at a cost of ₹78.01 crore with January 2007 as the scheduled date of completion. The project comprised of (A) Setting up of 30 MeV Medical Cyclotron[73] valuing ₹58.78 crore (Responsibility of Variable Energy Cyclotron Centre) and (B) Processing facility for radioisotopes and radiopharmaceuticals valuing ₹19.23 crore (Responsibility of BRIT). In 2006, the project cost (Part B) was revised upwards to ₹25.15 crore with an extended completion date of March 2008.

Audit analysis revealed that though the entire facility was targeted for completion by March 2008, it finally declared closed in December 2023 despite the fact that production of the following isotopes under the project had either not started or was completely abandoned.

Table 22: Status of Production of Isotopes

Isotope	Present Status	BRIT Reply/Audit comment
I-123	**Unachieved**: Gas target facility for production of I-123 was under development. Scheduled date of completion-December 2023. The purchase order for the establishment of I-123 production through a gas target had been placed on 23/06/2022. However, after repeated communication/negotiations, the vendor did not agree with the Purchase Order payment terms. Hence, the file was closed.	BRIT had already developed the alternate technology for the production of I-123 using Te-124 solid target and I-123 was produced on a trial basis and was in the process of getting the regulatory approvals. BRIT stated (September 2024) that regulatory approval for the production of I-123 using Te-124 had not been obtained yet.

[73] ***Observation has appeared under Para 4.1 of CAG Report No. 6 of 2020.***

Isotope	Present Status	BRIT Reply/Audit comment
Na-22 and Co-57	**De-scoped**: This Project, which was to develop a multipurpose solid target for the production of Na-22 and Co-57, was de-scoped.	BRIT stated (August 2023) that currently, this product was not being used as a radio-pharmaceutical.
68Ge/68Ga	**Unachieved:** Production of Ge-68/ Ga-68 radiopharmaceuticals, which was anticipated under the facility, was yet to commence (September 2024).	BRIT stated (March 2025) that the Installation and commissioning of hot cells at BRIT Regional Centre was in the final stages and a purchase order for 68Ge/68Ga generator was released (November 2024). Production of Ga-68 radiopharmaceuticals would be started immediately on receipt of the 68Ge/68Ga generator.
Cu-64 and I-124	**Incomplete:** Development of Cu-64 and I-124 has not been completed as of September 2024.	BRIT stated (September 2024) that a trial run for laboratory-scale production and radiochemical separation of Cu-64 from enriched Zn-68 target through Zn-68, Cu-64 nuclear reaction has been carried out
Zr-89	**Incomplete.** Development of Zr-89 has not been completed as of September 2024.	BRIT stated (September 2023) that it was in the target development stage. BRIT further stated (September 2024) that the literature survey and target preparation have been carried out.
Ga-67 and Tl-201	**Completed but not produced:** Commercial production of Ga-67 and Tl-201 was not initiated as of August 2023 due to lack of demand.	BRIT stated (September 2023) that during the formulation of the project proposal, the demand for Ga-67 and Tl-201 was there; however, some other new radiopharmaceuticals like Ga-68 and Tc-99m have replaced it.

Thus, due to the much delayed execution of the project by BRIT, production of above mentioned isotopes under the project could not be started and as a consequence most isotopes had either become obsolete or irrelevant as better technologies were developed, leading to the abandonment of production of these isotopes in the course of the execution of the project. Only Zr-89, Cu-64 and I-124 and 68Ge/68Ga are still in demand but their development and production has not been completed even after expiry of more than 16 years, thereby denying society the intended benefits.

ii. Project titled 'Advance Facility for Radiopharmaceuticals Production'

Department of Atomic Energy sanctioned (December 2012) project titled 'Advance Facility for Radiopharmaceuticals Production' at an estimated cost of ₹41.50 crore with the scheduled date of completion as 31 March 2017, to indigenously cater to the needs of Nuclear Medicine Centres of the country for the new generation radiopharmaceuticals products at affordable prices.

BRIT completed the project in March 2021 after availing four extensions that led to a time overrun of four years from original date of completion of 31 March 2017.

BRIT attributed (August 2023) the time overrun to the initial delay in clearing the space for installation of the facilities for production of radiopharmaceuticals.

Audit observed that the project had five specific deliverables that were further divided into sub-deliverables. Project cost in respect of each deliverable/sub-deliverable was not depicted in the Detailed Project Report. Project Completion Report and other relevant documents revealed that in case of three of the five specific deliverables, BRIT could not achieve some sub-deliverables and some others were not pursued, even though all the deliverables were stated as achieved in the Project Completion Report (March 2021). The detailed status of these three deliverables is given in the table below.

Table 23: Details of Deliverables

Deliverables	Sub-deliverables under the main Deliverable	Actual status observed by Audit	BRIT's Reply/Audit comment
New Generation Radiopharmaceuticals with radioisotopes usingY-90, Lu-177, Sr-89, I-131, P-32, Sm-153 to cure and diagnose diseases and disorders in patient	(i) Set-up advanced facility to produce 400-500 I-131 capsules per batch and also reduce manRem[74] and labour intensity	Based on indent (March 2017), Purchase Order was placed (May 2019) for 50 mm thick lead shielded processing facility for the production of I-131 capsule at ₹3.43 crore with delivery date as 19 March 2020. Though, item was received on 12 March 2020 and ₹2.85 crore was released, the contractor could not install the same. Finally, facility was commissioned departmentally by using in-house resources (April 2023), but production rate of 400-500 I-131 capsules per batch remained unachieved (September 2024). Due to non-commencement of facility for three years, BRIT had to forgo prospective revenue at a rate ranging between ₹0.50-0.60 crore per month from October 2020.	BRIT replied (October 2023) that though the facility could not be made operational in mid of 2023 but there was no revenue loss incurred to BRIT. This was because the old running manual facility having a capacity of 300 capsules/ batch was effectively utilised to meet the existing demands of customers. BRIT further stated (September 2024) that on approval of the regulators (May, 2022), around 2Ci of I-131 was handled and during this production, facility performed as desired and all the quality control parameters were met. The facility was now ready for producing 400-500 capsules per week.
	(ii)Setting up of new radionuclides such as Lu-177, Y-90, Sr-89, *etc.*	During test production of Sr-89 for bone pain palliation[75], it failed to meet the required quality criteria needed for its end use. Alternatively, the facility set up for the production of Sr-89 was used for production of another Radiopharmaceutical product.	BRIT stated (October 2023) that Sr-89 was a useful radioisotope at the time of formulation of the project and with the emergence of Lu-177 EDTMP, final deliverable for same application was achieved.

[74] ***Absorbed Radiation dose-one rem absorbed by one individual.***

[75] ***Bone pain palliation refers to the treatment aimed at relieving pain caused by bone metastases (cancer that has spread to the bones).***

Deliverables	Sub-deliverables under the main Deliverable	Actual status observed by Audit	BRIT's Reply/Audit comment
	(iii)New advanced processing plants for processing radioisotopes like P-32 and Sm-153 were to be set up	This sub-deliverable was not pursued since P-32 and Sm-153 based radiopharmaceuticals had lost relevance over the years since the inception of the idea of this project in 2010.	BRIT stated (October 2023) that P-32 and Sm-153 were among the prime radioisotopes for medical end use in 2010, during the time of formation of this project. This product lost relevance when Y-90 and Lu-177-based HA products for similar applications were launched by BRIT in mid-2022.
Enhanced production capacity of Radiopharmaceuticals	(i) Up-gradation of Special Illuminator labs and establishment of automated production of Special Illuminators used in defense establishments	Trapping unit for Special Illuminator production facility was created in BRIT (March 2021) at an expenditure of ₹0.40 crore, but the operation and production of Special Illuminator had to be stopped (October 2022) as per prevailing regulatory requirement and it is currently (September 2024) not in use. Resultantly, BRIT could only supply 51.84 *per cent* of the total market demand of Special Illuminator during 2021-23 (***Annexure 38***)	BRIT stated (September 2024) that since the regulator has withdrawn permission (October 2022) for the production of special illuminators, the facility is not currently in operation/use.
FRET based PCR detection system validation	One of the objectives was to develop kits for the detection and determination of virus load for Hepatitis B and C (HVB and HVC) and kits for sub-tying of cancer	Kits for detection and determination of virus load for Hepatitis B and C (HVB and HVC) are yet to be standardised (September 2024). Thus, the same has not been developed/made available in the market for clinical use (September 2024)	BRIT stated (October 2023) that the commercialisation aspect of the kits was not included in the scope of the project and these kits demanded validation using clinical samples for commercialisation and suitable infrastructural set-up and rigorous regulatory approvals for handling these infectious samples and testing. BRIT stated (September 2024) that Research in this direction was in progress, but no timeline could be proposed for final completion. Only DNA/ RNA Kits in this direction have been developed for validation of these infection kits.

As would be seen from the table above, BRIT did not report the non-pursuance/non-achievement/deviation from the attainment of above sub-deliverables in the Project

Completion Report submitted to Project Appraisal Committee/Department of Atomic Energy. The PCR submitted by BRIT to PAC/DAE did not mention any alternative through which the undelivered objectives/sub-objectives could be achieved. Audit also noticed that due to non-consideration of prevailing regulatory requirements at the time of establishment of the automated process, the intended objective to cater for the increasing demand for special illuminators remained unaccomplished. Further, the kits for detection and determination of virus load and kits for sub-tying cancer were not delivered to society, even though the project was declared as completed in March 2021.

ii. Project titled 'Technology Development for Advance Radiation Technology Equipment'

Department of Atomic Energy in March 2013 sanctioned 12th Plan Project of BRIT titled 'Technology Development for Advanced Radiation Technology Equipment' at an estimated cost of ₹80 crore with scheduled date of completion as March 2017. In December 2020, the project was declared as completed after incurring an expenditure of ₹18.61 crore.

Status of achievement of deliverables under this project is discussed in the ensuing paras

a) Non-utilisation of building valuing ₹4.58 crore for its intended purpose

Under the core objective of 'Setting up of automated production facility for I-125 seeds', an automated production plant for I-125 seed was to be set up for which a building was to be constructed and an automated machine was also to be procured. Accordingly, a work order was placed (May 2015) for construction of building for I-125 seed manufacturing plant with the schedule date of completion as 15 August 2016. Construction of building was completed (September 2018) by incurring an expenditure of ₹4.58 crore. Audit observed that even though construction of building was completed in September 2018, procurement of state-of-the art-I-125 seed manufacturing machine was kept in abeyance by DAE (January 2020) and it was decided (September 2020) to short close the execution of setting up of I-125 seeds manufacturing facility due to development of new technologies which were more effective.

Audit observed that as per approved major milestones of project, placement of Purchase Order for procurement of equipment was to be completed by June 2014. However, the tender evaluation process was completed only in April 2019. Thus, there was in-ordinate delay of over 57 months[76] in completing the tendering process. Meanwhile, the projected technology (I-125 seed) became outdated and BRIT had to short close the project. BRIT accepted (October 2023) the fact that the building could not be used for the intended purpose and

[76] ***July 2014 to March 2019 = 57 months.***

further stated (September 2024) that part of the building was being utilised by Civil, Electrical and Maintenance people. The other part was planned for setting up of radiopharmaceutical plant which will be completed by July 2026.

Due to slow pace of tendering process there was in-ordinate delay of over 57 months for the proposed building for establishment of I-125 seed plant valuing ₹4.58 crore which was ready to use since September 2018. Now, it was planned to be utilised for radiopharmaceutical plants by July 2026, which resulted in blockage of ₹4.58 crore.

b) Project short closed without achievement of deliverable

To make Blood Irradiation cheaper and affordable for poor people, a Purchase Order valuing ₹0.23 crore was placed in July 2018 under Technology Development for Advance Radiation Technology Equipment for supply of two BI – 1000 IS Cesium based Blood Irradiator designed for 3200 Ci sealed source of Cs-137 with scheduled date of delivery on or before June 2019. It was observed that the apex project was declared as complete in December 2020. Against the scheduled delivery date of June 2019, materials for blood irradiator were received only in February 2023. However, installation of the Blood Irradiators has not been completed till July 2023 due to non-availability of Cs-137. Audit scrutiny further revealed that subject deliverable of the short-closed Technology Development for Advance Radiation Technology Equipment project is being pursued through 'Equipment Development Project' which was sanctioned (November 2021) by Department of Atomic Energy with project outlay of ₹24 crore with scheduled date of completion as November 2025.

BRIT stated (Sept 2024) that the Blood Irradiator was a developmental project and the source has been loaded and testing is completed; however, currently it has unloaded the source as it was a developmental work.

Thus, it can be construed that even though some deliverables under Technology Development for Advance Radiation Technology Equipment project are still being pursued, BRIT declared these deliverables achieved in the PCR of the short closed project. Further, even though BRIT completed testing of Blood Irradiator with loaded source, but the core deliverable to make Blood Irradiation cheaper and affordable for poor people remained unaccomplished as of September 2024.

7.4.4.3 Ongoing Projects with Scheduled Completion Date before 31 March 2024

Out of seven ongoing projects, two projects were scheduled for completion before 31 March 2024. Out of these two projects, audit observation relating to one project 'Indigenous High Dose Rate Brachytherapy Equipment' has already appeared in CAG Report No. 24 of 2023. The audit observation on the second project is as under.

i. Delay in project titled 'Setting up of Medical Use Fission based Mo-99 production facility

Fission based Molybdenum-99 (Mo-99) (Fission Moly) is used for production of Technetium – 99m (Tc-99m) Column Generators[77] required for functional imaging of vital organs of human body in nuclear medicine centres. Since India was totally dependent on import of Mo-99, BRIT proposed (May 2010) a new scheme titled 'Setting up of Medical use fission base Mo-99 Production Facility'. Accordingly, Department of Atomic Energy sanctioned (September 2010) the project at a cost of ₹128 crore with scheduled completion date as January 2014.

A global two-part tender was floated (November 2010) for procurement of technology, machinery and equipment on turnkey basis. However, it took nearly two years to complete the technical evaluation of one bid which was technically suitable and finalise the terms of payment before opening (October 2012) of Part-II of the tender. Further, it was found that suitable bidder quoted price of ₹230 crore that was much higher than the estimated cost of ₹99 crore. Therefore, project cost was upwardly revised (May 2014) to ₹295 crore with extended schedule date of completion as March 2016.

A Proprietary Indent was raised (March 2014) in favour of the supplier and Purchase Order (PO) valuing ₹232 crore (USD[78]3,46,26,099) was awarded (May 2014) with a delivery period of 30 months. The PO was amended in October 2015 to reduce the scope with revise cost ₹230 crore (USD3,43,54,950). Subsequently, project completion date was extended from time to time up to December 2022.

Chairman (BRIT) constituted a Delay Analysis Committee on 21 May 2022, to verify the factors responsible for delay. Report of the Committee (May 2023) envisaged that out of total delay of 61.8 months[79], 27.75 months of delay was attributable to the supplier. Committee also highlighted the fact that there was no penalty clause for delay in execution of the contract. Meanwhile, project cost was further revised (May 2024) to ₹314.20 crore with revise completion date as December 2024.

It is observed that as per original sanction, commercial production of Mo-99 was to commence from January 2014, however, approval for regular production was awaited from AERB as of March 2025.

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[77] ***Technetium – 99m (Tc-99m) is the daughter product of Molybdenum-99 (Mo-99), it is the commonly utilised medical radioisotope in the world.***

[78] ***1 USD = ₹67.***

[79] ***27.75 months due to supplier, 16.25 months due to Directorate of Construction, Services and Estate Management, 15.1 months due to COVID-19, 2.7 months to Board of Radiation and Isotope Technology.***

Audit observed that-

(i) As per General principles of Contract (GFR 225), 'the terms of contract should not involve an uncertain or indefinite liability and all contracts shall contain a provision for recovery of liquidated damages for defaults on the part of the contractor. Where contract is for supply of equipment imported (subject to customs duty and foreign exchange fluctuations), the *per cent* and element of duties and taxes included in the price should be specifically stated, along with the selling rate of foreign exchange element taken into account in the calculation of the price of the imported item.' Further para 2.7.59.6 of Purchase Manual of Directorate of Purchase and Stores (DPS)/DAE also reiterated the same provision. Audit observed that though, supplier accepted the Purchase Order unconditionally, it kept on putting up new requirements[80]even after two years of placement of Purchase Order and BRIT accepted all the requests which caused time-overrun and in turn entailed cost overrun. However, it could not impose Liquidated Damages on the supplier due to non-incorporation of such clause in the Purchase Order. Further, BRIT did not incorporate any clause to safeguard against the exchange rate fluctuations over the original period of contract. As estimated in December 2022, BRIT would have to bear an additional expenditure of ₹7.95 crore due to foreign exchange variations at the time of final payment which was avoidable by incorporating appropriate clauses in the Purchase Order.

BRIT stated (October 2023) that there are no provisions for incorporating Liquidated Damages clause in Purchase Order released to foreign firms.

The GFRs and Directorate of Purchase and Stores' Purchase Manual do not prevent the purchaser from incorporating the Liquidated Damages clause in Purchase Order released to the foreign firms. Further, non-inclusion of clause in the purchase order to protect against foreign exchange fluctuations let to an additional expenditure of ₹7.95 crore.

(ii) Due to lack of due diligence while preparing the estimated cost, huge difference was observed between the estimated cost (₹99 crore) and the quoted price (₹230 crore). While accepting the fact, BRIT stated (July 2023) that technology cost was not correctly known at the time of floating the tender. The reply is not tenable since BRIT took almost two years to complete the technical evaluation which included obtaining inputs from experts, visit to the facilities installed by the supplier in other countries. This effort should have been made prior to preparing the estimates, rather than subsequent exercise. A better appreciation of technology *ab initio* would have had made the bidding process also more robust.

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[80] ***Eleven amendments to the Purchase Order made for fulfilment of new requirements and revision of milestone based payment schedule.***

(iii) Audit analysis also revealed that had the project been completed as per original schedule BRIT could have saved ₹25.22 crore (***Annexure 39***) during 2015-16 to 2023-24, towards differential amount between imported cost (₹40.25 crore) and indigenous production cost[81] (₹15.03 crore) of Mo-99. BRIT stated (October 2023) that due to delay in completion of the Project, Mo-99 had to be imported.

Thus, due to lack of due diligence while preparing the estimated cost of the project, it suffered time overrun of more than 11 years and cost overrun of ₹186 crore. Further, BRIT could not impose liquidated damages and had to bear an additional expenditure of ₹7.95 crore due to non-inclusion of relevant clauses in the purchase order.

ii. Ongoing Projects with Scheduled Completion Date after 31 March 2024

Out of five projects scheduled for completion after 31 March 2024, there were delays in execution of three projects. Details of these projects along with Audit findings and reply of BRIT are given in the table below.

Table 24: Delayed projects with Scheduled Completion Date after 31 March 2024

Name of the Project/ Detail	Details	Audit finding	BRIT's Reply/Audit comment
'Safety System Upgradation and refurbishment of Isotope Medical Division' sanctioned on May 2021 having sanctioned cost ₹11.34 crore with scheduled date of completion as April 2024.	The project was undertaken to resolve the perennial issue of source interference in existing Isotope Medical Division facility.	Atomic Energy Regulatory Board revoked the license (October 2018) for round the clock commercial operation of the facility with a recommendation to resolve the issue relating to source interference in existing Isotope Medical Division facility. However, BRIT took 16 months to submit a proposal to DAE which took another 15 months[82] to issue financial sanction May 2021. Audit observed that as of September 2024, BRIT had achieved financial progress of 71.36 *per cent, i.e.,* expenditure of ₹8.32 crore.	<u>BRIT's Reply</u> BRIT stated (October 2023) that the time was taken mainly by the Fact Finding Committee to determine the root cause of the problem. BRIT further stated (September 2024) that Isotope Medical Division facility will be available for round the clock commercial operations for the terminal sterilisation of healthcare product for industry (Public) by 1/3/2025. <u>Audit comment</u> The non-completion of project, resulted in delay in resumption of the facility at an affordable price. This delay also allowed opportunities for private players to take undue advantage of Small and Medium Enterprises and Hospitals due to unregulated pricing strategies as mentioned by BRIT itself in their DPRs.

[81] ***Current indigenous production cost at the rate of ₹42,583/Ci fixed by Board of Radiation and Isotope Technology has been taken into account for entire period.***

[82] ***Total Delay=31 months, from October 2018 (License for round the clock commercial operation of the facility was revoked by Atomic Energy Regulatory Board) to May 2021 (The project sanctioned by Department of Atomic Energy).***

Name of the Project/ Detail	Details	Audit finding	BRIT's Reply/Audit comment
'Modernisation and Augmentation of Radiopharmaceutical production Facilities' sanctioned on July 2021 with sanctioned cost of ₹64 crore and scheduled date of completion July 2026.	Under this project, Regional Centre, BRIT, New Delhi planned to establish Ga-68 radiopharmaceutical production facility that involved procurement of one hot cell and Ge-68-Ga-68 generator[83]	Regional Centre, BRIT, New Delhi procured one hot cell valuing ₹0.89 crore and paid ₹0.71 crore (80 *per cent* of Purchase Order value) on February 2020 that was received in February 2022 as against the scheduled date of May 2020. However, installation and commissioning of the same had not been completed as of September 2024 against the stipulated October 2022. Further, tender for procurement of Ge-68-Ga-68 generator was still under process.	BRIT's Reply BRIT stated (October 2023) that the indenting of the generators was planned in a phased manner as generators cannot arrive before the hot cells. However, hot cell installation was delayed which was attributable to the supplier. Also, the procurement of the generator got delayed due to procedural delays. BRIT further stated (September 2024) that procurement of Ge-68-Ga-68 generator was in advance stage. Audit comment Due to delay in installation/ commissioning of hot cell and procurement of generator, production of Ga-68 could not be achieved and associated benefits to the society remained undelivered till February 2025.
'Augmentation and Revamping of Product and Services Facilities' sanctioned on April 2021 having sanctioned cost of ₹65 crore with scheduled date of completion of April 2024.	This project was for developing infrastructure which would be helpful in increasing the performance and production of indigenously developed radiopharmaceuticals, radiation technology equipment and radiation application services.	As of September 2024, physical and financial progress was 47.98 *per cent* and *35.89 per cent* (₹23.33 crore), respectively, though, the scheduled completion date of the project was April 2024 that was further extended to March 2026. Reasons for slow progress were attributed to elaborate design activity of some milestones, contractual failure due to denial of accepting Work Order by eligible L1 bidder, involvement of large numbers of contract through CPPP/ GeM (Multiple retender/ reindent) in the project and delay in receipt of funds that were made available after eight months (January 2022) from issue of financial sanction.	BRIT's Reply BRIT stated (October 2023) that the delay in project execution was mainly due to post pandemic effects and contract failure on several occasions. Audit comment The intended benefits that were to be achieved in April 2024 are now projected for delivery in October 2026.

[83] ***Ge68-Ga68 generator is required to be coupled with hot cell.***

Name of the Project/ Detail	Details	Audit finding	BRIT's Reply/Audit comment
	Under this project upgradation of existing 'Install and Operate Type Irradiator' to 'CryoIrradiator' was also required to be carried out in order to help the researchers in developing a standard operating procedure for marine irradiation at a cost of ₹0.77 crore.	For this upgradation, chiller air unit, conveyor system and ventilation unit were required to be integrated and operated from a control system. The project was approved on August 2021 and was proposed to be completed within the stipulated time frame of six months to commemorate 75 years of Indian Independence. The Work Order was issued in October 2021 for ₹0.76 crore on nomination basis due to urgency to complete the project by May 2022. Despite urgency, hot commissioning of the CryoIrradiator was completed in March 2023, and it was opened in July 2023 for research.	BRIT's Reply BRIT stated (September 2023) that the chiller plant was not installed due to non-availability of site, leading to delay in hot commissioning. BRIT also stated (October 2023) that the party delivered and installed the plant as per the stipulated timeline. However, it could not be used for any research or commercial purpose till August 2022 as it had not obtained Atomic Energy Regulatory Board's approval. Audit comment BRIT could not ensure timely installation of the chiller plant due to non-readiness of site and regulatory approvals, resulting in delay in the commencement of the facility.

Thus, it was observed that there were persistent problems in achieving the timelines set for projects, which delayed the delivery of intended benefits.

Recommendation 27:

BRIT may monitor the project timelines, make prompt decisions to prevent delays and cost overruns and ensure that the objectives are met to protect the interests of the Government.

Recommendation 28:

BRIT may lay down a Standard Operating Procedure so that the benefits of the radiopharmaceuticals developed by it can reach society in a timely manner.

7.4.5 Financial Management

7.4.5.1 Non-recovery of outstanding dues on account of the sale of radioactive materials

As per Rule 9 of GFR 2017, 'it is the duty of the Department of the Central Government concerned 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.'

Audit observed that an amount of ₹174.64 crore[84] pertaining to 3,019 cases were pending as receivable on account of the sale of radioactive materials as of September 2024. Out of ₹174.64 crore, ₹22.17 crore was received in government accounts through unidentified customers and the net outstanding was ₹152.47 crore (***Annexure 40*).**

Audit test checked 162 cases (₹3.76 crore) pertaining to the sale of radioactive materials prior to 2013 and observed that BRIT had not followed up on the matter of settlement of dues with customers regularly despite having adequate staff for accounting functions. Audit analysis further revealed that there was no mechanism in place for timely realisation of previous dues before making new supplies. There were no penal provisions in place to deal with defaulting debtors. Reconciliation of accounts between BRIT and the customers was also not done. BRIT also decided (from 1 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. However, this clause was not included in the invoices generated during the period of audit.

The matter had been regularly brought to the notice of BRIT by Audit since 2006. The same had also appeared under Para 3.3 of CAG's Report No. 2 of 2018. In Action Taken Note (ATN) on this para, Department of Atomic Energy stated (June 2018) that frequency of intimation/warning to both government and private customers had been increased and outstanding dues had been reduced from ₹10.71 crore to ₹8.70 crore. However, the outstanding dues have increased to ₹152.47 crore as of September 2024.

BRIT stated (September 2024) that major outstanding dues pertains to pharmaceutical products which are used for cancer diagnostics/therapy and supply of this could not be stopped. BRIT had recovered approximately ₹22.19 crore against outstanding dues of ₹138.74 crore up to the year 2022-23. Efforts are being taken to recover the balance amount.

Inability of BRIT 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 ₹152.47 crore as of September 2024.

Recommendation 29:

BRIT may take remedial steps for monitoring and strengthening their payment recovery mechanism to ensure that the realisable dues are recovered in a timely manner.

[84] ***Out of ₹174.64 crore, ₹122.29 crore pertains to Government Organisations and ₹52.35 crore pertains to Private Organisations.***

7.4.5.2 Loss of ₹62.03 crore due to non-compliance with statutory provisions and non-production of the exemption certificate to local body authority

Due to non-compliance of statutory provisions, *viz*., Service Tax, Central Excise Duty and taxes paid to local body authority, BRIT suffered losses amounting to ₹62.03 crore from April 2005 to June 2017. Details of the cases, along with Audit observations and replies of the audited entity, are tabulated below.

Table 25: Details of Cases of non-compliance of statutory provisions

Rule Provisions	Audit Observations	BRIT's reply/Audit conclusions
As per Section 68(1) of the Finance Act, 1994, 'Every person[85] providing taxable service to any person shall pay service tax at the rate specified in Section 66 in such manner and within such period as may be prescribed'. The services of BRIT fall under Section 65(92), 65(105) (za) and 65 (105) (zzi) of the Finance Act 1994 under the heading 'Scientific and Technical Consultancy Services'.	Though BRIT commenced its production along commercial lines on March 1, 1989, it got registered with the service tax authority only on 30 June 2015. On receiving a Show Cause cum Demand Notice amounting to ₹1.91 crore (April 2018), BRIT with the approval of Department of Atomic Energy (May 2018) remitted (May 2018) the amount of ₹1.91 crore towards Service Tax liability from July 2012 to June 2017[86]. BRIT could not collect the service tax from Customer bills since the component of service tax on the customer bills for providing scientific and technical services was not incorporated in their bills.	BRIT's Reply BRIT stated (October 2023) that, as it was carved out of Bhabha Atomic Research Centre in 1989, it followed the procedures of Bhabha Atomic Research Centre and did not register under the applicable Tax authorities/laws till 29.06.2015. Hence, it was not possible to recover the amount from users before July 2015. **Audit conclusion**- BRIT suffered a loss of ₹1.91 crore due to the inordinate delay of more than 21 years in registration with service tax authorities.
Chapters 28 and 90 of the Central Excise Tariff Act, 1985, describe custom made radiation sources classifiable under the said Act under different tariff item numbers[87] and items[88]. Further, Rule 4 (1) of the Central Excise Rule 2002 stipulates that 'every person[89] who produces or manufactures any excisable goods, or who stores such goods in a warehouse, shall pay the duty leviable on such goods.	BRIT registered with Central Excise in January 2017. In March 2018, the Commissioner, Central GST and Central Excise issued an order to BRIT for ₹32.17 crore towards demand of Central Excise duty (for May 2012 to January 2017) plus ₹18.34 crore as interest and ₹8.04 crore as penalty. Accordingly, BRIT paid the total amount of ₹58.55 crore (***Annexure 41***) in May 2018 with Department of Atomic Energy's approval. Audit observed that BRIT did not assess the applicability of central excise duty on its products, leading to an additional burden of ₹58.55 crore on its organisation for excise duty, interest and penalties.	BRIT's Reply BRIT stated (October 2023) that as BRIT carved out of Bhabha Atomic Research Centre in 1989, followed the procedures of Bhabha Atomic Research Centre and not got registered under the applicable Tax authorities/laws till January 2017. Hence, it was not possible to recover the amount from the users prior to January 2017.

[85] ***As per the Finance Act 1994, 'Person' includes – an individual, a Hindu Undivided Family, a Company, a society, a limited liability partnership, a firm, the Government, a local authority.***

[86] ***Service tax amounting to ₹47,16,208 has not been charged to the customer for the period July 2015 to June 2017 for services rendered.***

[87] ***Tariff item no. 2844 4000, 9022 2100 and 9022 2900.***

[88] ***Apparatus based on the use of alpha, beta or gamma radiation, including radiography or radiotherapy.***

[89] ***As per the Finance Act 1994, 'Person' includes – an individual, a Hindu Undivided Family, a Company, a society, a limited liability partnership, a firm, the Government, a local authority.***

Rule Provisions	Audit Observations	BRIT's reply/Audit conclusions
No excisable goods, on which any duty is payable, shall be removed without payment of duty from any place, where they are produced or manufactured, or from a warehouse.'	Although BRIT paid ₹32.17 crore as excise duty, it could not recover from its customers because the excise duty was not included in the sale invoices from May 2012 to January 2017, resulting in an irrecoverable loss. Further, BRIT made an avoidable payment of ₹26.38 crore towards interest and penalty due to the delay in payment of the central excise duty.	**Audit conclusion**- Thus, BRIT had to incur an expenditure of ₹32.17 crore from the taxpayers' money as it could not recover the amount from its customers due to an inordinate delay of more than 15 years in registration with the Central Excise authorities.
Rule 146 (1) of Maharashtra Municipal Corporation Act 1949 stipulates that 'No *octroi* shall be leviable on any article which, at the time of its importation is certified by an officer empowered by the Government concerned in this behalf to be the property of the Government, to be used or intended to be used solely for public purposes and not to be used or intended to be used for purposes of profit'.	BRIT received a show cause notice (July 2012) from Navi Mumbai Municipal Corporation due to non-payment of cess. Accordingly, BRIT worked out the cess based on the expenditure incurred and paid an amount of ₹0.12 crore to Navi Mumbai Municipal Corporation on 8 February 2013 towards cess for the year 2011-12. Further, Navi Mumbai Municipal Corporation issued (July 2015) a demand notice for ₹5.77 crore[90], covering cess, interest and penalties from 2005-06 to 2012-13. BRIT Board and Department of Atomic Energy approved this payment in July 2016. Accordingly, BRIT paid ₹2.04 crore towards cess under protest in July 2016 and filed eight appeals for refund. In October 2021, Navi Mumbai Municipal Corporation ordered refund of ₹0.59 crore towards cess to BRIT and asked to pay ₹3.73 crore towards penalty and interest. Audit observed that BRIT was required to produce the certificate from an officer empowered by Government concerned certifying that the goods are imported belong to government and are imported for public purpose and are not used or intended to be used for the purpose of profit to get exemption against levy of cess. Since BRIT only produced this certificate in January 2017, an avoidable expenditure of ₹1.57 crore was incurred towards payment of cess and additional liability of ₹3.73 crore for which final order has already been passed for payment by Navi Mumbai Municipal Corporation.	BRIT's Reply BRIT stated (October 2023) that that eight appeals were filed before the Dy. Commissioner of cess (Appeals) Navi Mumbai Municipal Corporation. Out of this, three appeals were in favour of BRIT and an amount of ₹0.59 crore was saved to Government exchequer and remaining five appeals were against BRIT. However, as per the advice of the Government Counsel and approval of Department, BRIT has filed a Writ Petition for exemption from payment of cess and refund of the already paid amount. The matter is sub-judice. **Audit conclusion-** The fact remains that due to delay in submission of exemption certificate, BRIT incurred an avoidable expenditure ₹1.57 crore towards payment of cess.

Thus, despite having adequate accounting staff, BRIT took 15 and 21 years to be registered with Service Tax and Central Excise Authorities, respectively, which resulted in a cumulative loss of ₹34.08 crore, apart from avoidable expenditure of ₹26.38 crores towards interest and penalty. Further, due to non-production of exemption certificate to the Navi Mumbai Municipal Corporation, BRIT also incurred avoidable expenditure of ₹1.57 crore.

[90] ***₹2.04 crore for cess, ₹2.93 crore for interest and ₹0.80 crore for penalty.***

7.4.5.3 Inordinate delay in preparation of Proforma Accounts

Rule 92 of General Financial Rules 2017 states that 'where the operations of certain Government Departments working on a commercial or quasi-commercial basis, *e.g.*, an industrial factory or a store, cannot be suitably brought within the cash-based Government accounting system, the Head of the units shall be required to maintain such subsidiary and proforma accounts in commercial form as may be agreed between Government and the Comptroller and Auditor General of India. This includes maintenance of suitable Manufacturing, Trading, Profit and Loss Accounts and Balance Sheet.'

BRIT, an industrial unit of Department of Atomic Energy, commenced production programme along commercial lines on 1 March 1989. An independent accounting functionary, namely, 'Pay and Accounts Office', was formed and started functioning with effect from 1 April 1996.

As per the Department of Atomic Energy's instructions, BRIT had prepared proforma accounts for the years 2005-06 to 2008-09; however, the same was not in conformity with the *ibid* rule. Therefore, the Department suggested (November 2011) that BRIT should follow the formats used by Nuclear Fuel Complex and Heavy Water Board for the preparation of proforma accounts, which had the approval of CAG. The Department also clarified (November 2011) that the declaration of BRIT as a commercial unit is not required for the preparation of proforma accounts as long as the activities of the unit are commercial in nature.

Accordingly, BRIT had prepared (March 2014) proforma accounts for the year 2011-12 and submitted to the Chief Controller of Accounts, Department of Atomic Energy, for vetting (April 2014). Chief Controller of Accounts stated (January 2015) that the policies adopted by BRIT need to be ratified by the Department since it has a bearing on proforma accounts and confirm the date on which BRIT will be declared as a commercial unit and insisted on submitting the same to the BRIT Board.

Therefore, the BRIT Board recommended that BRIT be considered a commercial unit from 1 April 2016. Hence, BRIT prepared the proforma accounts for the years 2016-17 to 2018-19 and submitted them to the Internal Inspection Wing, Department of Atomic Energy for vetting (July 2022).

Audit analysis revealed that though the Department of Atomic Energy had clarified in November 2011 that the declaration of BRIT as a commercial unit is not required for the preparation of proforma accounts, BRIT Board declared the activities of BRIT as commercial from April 2016, which was not in conformity with the Department of Atomic Energy's clarification. Audit analysis also highlighted the fact that BRIT has commenced administration of the production

programme along commercial lines since March 1989, even though the initiative was taken from the year 2005-06. Thus, BRIT failed to prepare/finalise the proforma accounts since inception till 2015-16.

BRIT stated (September 2024) that the proforma accounts for the financial years 2016-17 to 2018-19 were vetted by Internal Inspection Wing and submitted (June 2024) to CAG Audit. The proforma accounts for the financial years 2019-20 to 2021-22 were submitted to their Internal Inspection Wing for vetting and the proforma accounts for the years 2022-23 to 2024-25 were under process.

Due to non-submission of proforma accounts from its inception until 2015-16, the correctness of figures appearing in the proforma accounts for 2016-17 to 2018-19 submitted to CAG Audit could not be ascertained. Thereby, it is not possible to determine the Board's true financial status in the subsequent years.

Recommendation 30:

BRIT may deploy a dedicated team to ensure submission of proforma accounts from its inception so that the true and fair financial position may be depicted in the accounts.

7.4.6 Internal Control Mechanism

7.4.6.1 Irregular expenditure of ₹1.34 crore on account of development and implementation of e-Portal

Rule 138 of General Financial Rules (2017), stipulates that 'Any anticipated or actual savings from a sanctioned estimate for a definite project shall not, without special authority, be applied to carry out additional work not contemplated in the original project'. Further, Rule 63 of GFR (2017), states that 'No expenditure shall be incurred during a financial year on a 'New Service' except after obtaining a supplementary grant or appropriation.

On behalf of BRIT, the Directorate of Purchase and Store (DPS) issued (October 2017) a Purchase Order for the development of an e-portal under the project 'Technology Development for Advance Radiation Technology Equipment (TDARTE)' entirely on turnkey basis at a total cost of ₹1.36 crore. The installation, commissioning, demonstration and training were completed in December 2020 against the scheduled date in October 2019.

Audit analysis of Detailed Project Report of the said project revealed that the proposal to

upgrade overall infrastructural facilities in BRIT, Vashi Complex was broadly divided into Radiopharmaceutical and Engineering Programmes. However, the scope of development of e-portal was neither included under Radiopharmaceutical programme nor under Engineering programme.

Audit observed that BRIT had incurred ₹1.34 crore for development of e-portal from savings of sanctioned project TDARTE without approval of competent authority, which was not contemplated in the original project as well as in the annual budget for the year as a 'New Service'.

BRIT stated (October 2023) that since development of e-portal was envisaged (under infrastructural augmentation) in TDARTE project, which was already approved by Department of Atomic Energy, separate approval for the procurement of e-portal was not needed.

BRIT further clarified (October 2023) that electrical infrastructure augmentation was included in the Detailed Project Report of TDARTE project, which essentially included upgradation of electrical systems and networking infrastructure in BRIT. Both the developments of Information Technology and hardware infrastructure were clubbed and executed through a turnkey contract.

Audit analysis of e-portal further revealed the following observations.

(i) Non-upgradation of Mobile application 'BRIT Bandhu'

To equip customers with more user friendly tool and also match the requirements of modern day e-commerce platform, BRIT introduced a mobile application named BRIT Bandhu for its Sales and Management System, which offers up to date notifications on status, tracking of orders, invoices, reminder for renewal of procurement authorization, *etc*. Audit observed that the Supplier handed over 'BRIT Bandhu' to BRIT in December 2020. However, the mobile application had not been updated thereafter and the application was neither compatible/accessible on IOS smartphones nor on latest versions[91] of Android smart phones. Thus, the sales and management system of e-portal was not accessible through BRIT-Bandhu.

BRIT while accepting the observation (October 2023) stated that it would need to further work towards newer versions of the app incorporating the feedback of users.

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[91] ***It only supports Android version 8/9/10.***

(ii) Non-identification of customers at the time of receipt of payment

On review of outstanding dues on e-Portal, it was observed that ₹13.06 crore had been received and credited in Government Accounts during the period 2019-20 to 2022-23.

Audit observed that BRIT is unable to identify the customers on e-Portal at the time of receipt of payments due to lack of sufficient data of customers. Due to this limitation, an amount of ₹22.17 crore received towards payment was kept separately as 'unidentified customers'.

BRIT stated (August 2023) that BRIT e-Portal is independent software integrated to Bharatkosh gateway for online payment purposes. BRIT further stated (October 2023) that if a customer makes a direct payment without being redirected by e-Portal; Bharatkosh or any other agency will never send any automated feedback to e-Portal and that is why it cannot recognise suspense payments, unless customer informs BRIT. BRIT has communicated the issue to Bharatkosh team and on receipt of positive response, BRIT will take-up backend development for reconciliation of such payments.

BRIT's reply confirms the limitation of the e-Portal.

(iii) Non-availability of facility for the settlement of payments received through cheques/ demand draft

Audit observed that there is no facility available on e-Portal for the settlement of payments received through cheques/demand drafts on account of the sale of products. BRIT replied (August 2023) that settlements of payments received through cheque/demand draft were not envisaged initially and this issue was realised only after its implementation.

(iv) Requirements of users for smooth operation

Audit observed that the e-Portal of BRIT was not user-friendly as it could not provide services such as-

- a dedicated accounts dashboard with specific features and seamless integration to fulfil the requirement of easy data compiling and auditing,
- an independent web-platform for managing back-end logistics operations, preparation of billing reports, *etc.*,
- an independent platform/module for sending notifications to internal users related to stage-wise progress mapping of an order placed in e-Portal,

- an independent report module for Management Information System (MIS) activities for comprehensive and customisable MIS Reports and
- subscription to services like GST, e-invoicing, email sending, SMS sending, *etc.,* for portal, website and Radiopharmaceutical Committee (RPC) web portal.

BRIT stated (October 2023) that it had identified and realised similar shortcomings and would consider them in the second phase of development/upgradation.

7.4.6.2 Testing of isotopes without traceable standards and approval of regulatory authority

Measurement of radionuclide content in commodities is an important regulatory requirement for international trade. The International Atomic Energy Agency (IAEA) and World Health Organisation (WHO) have specified the radioactivity concentration limits for various commodities and different radionuclides.

The AERB is entrusted with the responsibility for laying down safety standards and framing rules, regulations and procedures covering regulatory functions envisaged under the Atomic Energy Act 1962. Accordingly, AERB issued (February 2003) a booklet on 'Accreditation of Laboratories for Measurement of Radionuclide content in commodities'. This booklet *inter alia* describes the operational and technical requirements to be met by laboratories desiring accreditation for measurements of radionuclide content in commodities, performance testing procedures, post-accreditation responsibilities of the laboratories, format of the application form for seeking accreditation, *etc.*

Radio Analytical Laboratory of BRIT is engaged in the testing and certification of radioactivity content in commodities (including farm products, milk products, meat, animal feed supplements, poultry feed supplements and many other miscellaneous products). A man-made radioactivity test certificate is a mandatory requirement to facilitate the export of commodity in certain countries. Hence, the manufacturer/exporter approaches BRIT for test certificate.

Radio Analytical Laboratory also undertakes the measurement and certification of naturally occurring radionuclide content in various environmental samples, especially rock phosphate, gypsum, coal, fly ash and cement bricks containing fly ash from various Thermal Power Plants. BRIT had issued 'Radioactivity Test Certificate'[92] to various customers mentioning the level of Cs-134, I-131, Ru-103 and Ru-106 isotopes in commodities after conducting tests.

[92] ***Radioactivity Test Certificate is certificate given by Board of Radiation and Isotope Technology containing the level of radioactivity content in commodities like farm products, meat, etc., given by the customers.***

Audit observed that BRIT had not adopted any standards for performing such tests. Due to non-availability of standards, National Accreditation Board for Testing and Calibration Laboratories did not cover the above isotopes for which test certificates have been issued by Radio Analytical Laboratory, despite it being accredited with National Accreditation Board for Testing and Calibration Laboratories.

BRIT had tested these isotopes based on the in-house procedures[93] adopted in the laboratory. However, these procedures have not been certified by the regulatory board of the Department of Atomic Energy (Atomic Energy Regulatory Board/Radiopharmaceutical Committee) or any Competent Agency.

Due to lack of standard/approved procedure, the values in the report might not be accurate. Thus, issuance of test certificate without standard/approved procedure might not be practicable/ suitable for animal as well as human consumption.

BRIT stated (October 2023) that it was not possible to maintain a traceable standard for short-lived radioisotopes due to technical reasons and they follow internationally accepted standards and published procedures for the measurement of all radionuclides.

The fact remains that the test certificates are being issued without following the procedure approved by regulatory authority, despite the Atomic Energy Regulatory Board's laid down operational and technical requirements to be met by labs desiring accreditation.

Recommendations 31:

BRIT may obtain the approval of the regulatory authority for its in-house procedure adopted for testing of radioactive isotopes of Cs-134, I-131, Ru-103 and Ru-106.

7.4.7 Conclusion

BRIT was unable to properly monitor and implement nine projects during 2003-04 to 2022-23 that led to both time and cost overruns. Poor monitoring of the projects led to their slow execution, resulting in many deliverables of the projects becoming obsolete and abandoned. Further, BRIT failed to recover outstanding dues for its products from its customers that resulted in outstanding dues amounting to ₹152.47 crore as of September 2024. BRIT did not comply with the regulations of tax authorities in time, which led to tax liabilities amounting ₹62.04 crore, including service tax, excise duty, cess, interest and penalties. Proforma accounts of BRIT were not prepared since inception till 2015-16, without which the Board's true financial status cannot be determined. BRIT also incurred irregular expenditure of ₹1.34 crore on the

[93] ***Board of Radiation and Isotope Technology has adopted in-house procedure with steps like energy calibration of instruments, determination of background of detector.***

development of the e-portal. The mobile application BRIT Bandhu also could not become functional since its inception leading to ineffective sales and management system. BRIT is issuing test certificates of radioactive isotopes of Cs-134, I-131, Ru-103 and Ru-106 without following any approved procedures.

The matter was referred to the Department of Atomic Energy in February 2025, their reply was awaited as of March 2025.

New Delhi
Dated: 08 December 2025

(Dr. Kavita Prasad)
Director General of Audit Central Expenditure
Environment and Scientific Departments

Countersigned

New Delhi
Dated: 10 December 2025

(K. Sanjay Murthy)
Comptroller and Auditor General of India

ANNEXURES

Annexure 1

(Refer to Para 1.5)

Grants released to Central Autonomous Bodies auditable under Sections 14 and 15 of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971

Sl. No	Ministry/Department Name of Autonomous Body	Amount of grants released in FY 2022-23 *(₹ in crore)*
Central Autonomous Bodies under the Department of Space		
1.	Physical Research Laboratory, Ahmedabad	177.50
2.	National Atmospheric Research Laboratory, Gadanki	33.92
3.	North Eastern Space Applications Centre, Umiam	24.27
4.	Semi-Conductor Laboratory, Mohali	80.00
5.	Indian Institute of Space Technology, Thiruvananthapuram	72.77
	Sub-Total	**388.46**
Central Autonomous Bodies under the Department of Atomic Energy		
6.	Atomic Energy Education Society, Mumbai	120.00
7.	Harish Chandra Research Institute, Prayagraj	40.80
8.	Institute of Mathematical Science, Chennai	60.20
9.	Institute of Physics, Bhubaneswar	53.81
10.	Institute for Plasma Research, Gandhi Nagar	275.68
11.	Saha Institute of Nuclear Physics Kolkata	142.39
12.	Tata Institute of Fundamental Research Mumbai	758.60
13.	Tata Memorial Center, Mumbai	1169.90
14.	National Institute of Science Education and Research, Bhubaneswar	177.83
15.	Homi Bhabha National Institute, Mumbai	6.31
16.	Centre for Excellence in Basic Sciences, Mumbai	20.58
	Sub-Total	**2826.10**
Central Autonomous Bodies under the Department of Science and Technology		
17.	Agharkar Research Institute-MACS, Pune	36.41
18.	Aryabhatta Research Institute of Observational Sciences, Nainital	46.48
19.	Bose Institute, Kolkata	86.52
20.	Birbal Sahni Institute of Palaeosciences, Lucknow	89.09
21.	Centre for Nano and Soft Matter Sciences, Bengaluru	15.22
22.	Indian Association for the Cultivation of Science, Kolkata	160.03
23.	Indian Institute of Astrophysics, Bengaluru	75.45
24.	Indian Institute of Geomagnetism, Navi Mumbai	50.08
25.	Institute of Advanced Study in Science and Technology, Guwahati	44.11
26.	Institute of Nano Science and Technology, Mohali	38.19
27.	International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad	85.12
28.	Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru	116.47
29.	Raman Research Institute, Bengaluru	63.56

Sl. No	Ministry/Department Name of Autonomous Body	Amount of grants released in FY 2022-23 *(₹ in crore)*
30.	S.N. Bose National Centre for Basic Sciences, Kolkata	45.26
31.	Wadia Institute of Himalayan Geology, Dehradun	46.33
32.	Technology Information, Forecasting and Assessment Council, New Delhi	16.17
33.	National Innovation Foundation- India, Gandhinagar	11.60
34.	North East Centre for Technology Application and Reach, Shillong	14.66
35.	Vigyan Prasar, Noida	12.79
36.	Indian Academy of Sciences, Bengaluru	7.00
37.	Indian National Academy of Engineering, New Delhi	4.01
38.	Indian National Science Academy, New Delhi	25.91
39.	Indian Science Congress Association, Kolkata	10.13
40.	The National Academy of Sciences, India, Prayagraj	4.41
	Sub-Total	**1105.00**
Central Autonomous Bodies under the Department of Biotechnology		
41.	National Institute of Immunology, New Delhi	97.35
42.	National Centre for Cell Science, Pune	70.60
43.	Centre for DNA Fingerprinting and Diagnostics, Hyderabad	50.25
44.	National Brain Research Centre, Gurgaon	37.40
45.	National Institute for Plant Genome Research, New Delhi	84.50
46.	Institute of Bio-resources and Sustainable Development, Imphal	20.87
47.	Institute of Life Science, Bhubaneswar	42.50
48.	Translational Health Science and Technology Institute, Faridabad	72.85
49.	Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram	128.28
50.	National Institute of Biomedical Genomics, Kalyani	37.00
51.	National Agri-food Biotechnology Institute, Mohali	24.00
52.	Institute For Stem Cell Science and Regenerative Medicine, Bengaluru	57.38
53.	National Institute of Animal Biotechnology, Hyderabad	34.63
54.	Centre for Innovative and Applied Bioprocessing, Mohali	13.00
55.	International Centre for Genetic Engineering and Biotechnology, New Delhi	43.01
	Sub-Total	**813.62**
Central Autonomous Bodies under the Ministry of Environment, Forest and Climate Change		
56.	Indian Council of Forestry Research and Education, Dehradun	227.64
57.	Central Pollution Control Board, New Delhi	115.73
58.	G.B. Pant National Institute of Himalayan Environment, Almora	23.80
59.	Indian Institute of Forest Management, Bhopal	45.00
60.	National Centre for Sustainable Coastal Management, Chennai.	24.07
61.	Salim Ali Centre for Ornithology and Natural History, Coimbatore.	9.08
62.	Institute of Forest Genetics and Tree Breeding, Coimbatore.	22.61
63.	Padmaja Naidu Himalayan Zoological Park, Darjeeling	0.39
64.	Tropical Forest Research Institute, Jabalpur	21.40

Sl. No	Ministry/Department Name of Autonomous Body	Amount of grants released in FY 2022-23 *(₹ in crore)*
65.	Institute of Forest Productivity, Ranchi	10.23
66.	Rain Forest Research Institute, Jorhat	17.88
67.	Forest Research Centre for Bamboo and Rattan, Aizawl	1.32
	Sub-Total	**519.15**
Central Autonomous Bodies under the Ministry of New and Renewable Energy		
68.	National Institute of Wind Energy, Chennai	22.00
69.	National Institute of Bio Energy, Punjab	7.00
70.	National Institute of Solar Energy, Haryana	16.00
	Sub-Total	**45.00**
Central Autonomous Bodies under the Ministry of Earth Sciences		
71.	National Centre for Polar Ocean Research, Goa	223.58
72.	India Institute of Tropical Meteorology, Pune	151.80
73.	National Institute of Ocean Technology, Chennai	200.50
74.	Indian National Centre for Ocean Information Services, Hyderabad	63.00
75.	National Centre for Earth Science Studies, Thiruvananthapuram	27.56
	Sub-Total	**666.44**
	Grand Total	**6363.77**

Annexure 2
(Refer to Para 1.6)
Outstanding Utilisation Certificates

Sl. No.	Ministry/Department	Period to which the grants relate (up to March 2022)	Utilisation Certificates outstanding in respect of grants released up to March 22, which were due by 31 March 2023	Amount *(₹ in crore)*
			Number	
1.	**Department of Atomic Energy**			
		Up to March 2014	232	18.27
		2014-21	420	91.79
		2021-22	72	14.91
		Sub-Total	**724**	**124.97**
2.	**Department of Space**			
		Up to March 2014	124	3.46
		2014-21	254	15.04
		2021-22	91	7.47
		Sub-Total	**469**	**25.97**
3.	**Department of Scientific and Industrial Research**			
		Up to March 2014	--	--
		2014-21	4	(-) 40.35
		2021-22	0	59.38
		Sub-Total	**4**	**19.03**
4.	**Department of Science and Technology**			
		Up to March 2014	--	--
		2014-21	9910	2909.75
		2021-22	3819	1252.86
		Sub-Total	**13729**	**4162.61**
5.	**Department of Biotechnology**			
		Up to March 2014	--	
		2014-21	18041	7974
		2021-22	2013	1296
		Sub-Total	**20054**	**9270**
6.	**Ministry of Environment, Forest and Climate Change**			
		Up to March 2014	3788	163.21
		2014-21	716	452.52
		2021-22	260	409.16
		Sub-Total	**4764**	**1024.89**

Sl. No.	Ministry/Department	Period to which the grants relate (up to March 2022)	Utilisation Certificates outstanding in respect of grants released up to March 22, which were due by 31 March 2023	Amount *(₹ in crore)*
			Number	
7.	**Ministry of New and Renewable Energy**			
		Up to March 2014	114	79.08
		2014-21	679	1733.21
		2021-22	232	381.29
		Sub-Total	**1025**	**2193.58**
8.	**Ministry of Earth Sciences**			
		Up to March 2014	461	31.48
		2014-21	159	29.00
		2021-22	137	23.64
		Sub-Total	**757**	**84.12**
		Total	**41526**	**16905.17**

Annexure 3
(Refer to Para 1.7)
List of Central Public Sector Enterprises

Sl. No.	Name of CPSE	Result of Supplementary Audit for FY 2022-23
Ministry of New and Renewable Energy		
1.	Himachal Renewables Limited, Shimla	Non-review certificate
2.	Indian Renewable Energy Development Agency Limited, Delhi	Nil comments along with the Management letter issued
3.	Solar Energy Power Corporation of India Limited, Delhi	Nil comments along with the Management letter issued
4.	Lucknow Solar Power Development Corporation Limited	Non-review certificate
5.	Rewa Ultra Mega Solar Limited, Corporate Office	Nil comments along with the Management letter issued
6.	Karnataka Solar Power Development Corporation Limited, Bengaluru	Nil comments along with the Management letter issued
7.	Renewable Power Corporation of Kerala Limited, Kasargod	Nil comments along with the Management letter issued
8.	Andhra Pradesh Solar Power Corporation Private Limited, Vijayawada	Nil comments along with the Management letter issued
Department of Biotechnology		
9.	Biotechnology Industry Research Assistance Council, Delhi	Nil comments along with the Management letter issued
10.	Bharat Immunologicals and Biologicals Corporation Limited, Delhi	Nil comments along with the Management letter issued
11.	Indian Vaccines Company Limited, Delhi	Non-review certificate
Department of Scientific and Industrial Research		
12.	Central Electronics Limited, Ghaziabad	Nil comments along with the Management letter issued
13.	National Research Development Corporation, New Delhi	Non-review certificate
Ministry of Environment, Forest and Climate Change		
14.	Andaman Islands Forest and Plantation Development Corporation Limited, Port Blair	MCA 21 database indicates that the CPSE has been struck off, but this is yet to be confirmed by the relevant Ministry.
Department of Space		
15.	Antrix Corporation Limited, Bengaluru	Nil comments along with the Management letter issued
16.	NewSpace India Limited, Bengaluru	Nil comments along with the Management letter issued
Department of Atomic Energy		
17.	Bhartiya Nabhikiya Vidyut Nigam Limited (Bhavini), Kalpakkam	Nil comments along with the Management letter issued
18.	Electronics Corporation of India Limited, Hyderabad	Nil comments along with the Management letter issued

Sl. No.	Name of CPSE	Result of Supplementary Audit for FY 2022-23
19.	Anushakti Vidyut Nigam Limited, Corporate Office, Mumbai	Nil comments
20.	Indian Rare Earth (India) Limited, Head Office, Mumbai	Nil comments along with the Management letter issued
21.	Nuclear Power Corporation of India Limited- Indian Oil Nuclear Energy Corporation Limited, Mumbai	Nil comments
22.	Nuclear Power Corporation of India Limited, Corporate Office, Mumbai	Audit comments
23.	IREL-IDCOL Limited, (Corporate Office)	Non-review certificate
24.	Uranium Corporation of India Limited (UCIL Corporate Office)	Nil comments along with the Management letter issued

Annexure 4

(Refer to Para 1.8*)*

Statement of Losses and Irrecoverable Dues Written off/Waived during 2022-23

Name of Ministry/ Department	Write-off of Losses and Irrecoverable Dues due to (₹ in lakh)									
	Failure of the 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	NIL	NIL	NIL	NIL	14	3.14	NIL	NIL	NIL	NIL
Ministry of New and Renewable Energy	NIL									
Department of Bio-Technology	NIL									
Department of Science and Technology	NIL									
Department of Scientific and Industrial Research	NIL									
Department of Space					1	0.32				
Ministry of Earth Sciences	NIL									
Ministry of Environment, Forest and Climate Change	NIL									
Total					**15**	**3.46**				

Annexure 5

(Refer to Para 1.9)

Department/Ministry wise break-up of outstanding Inspection Reports and Paras

Sl. No.	Ministry/ Department	No. of IRs/ Paras pending as of 31 March 2023										Grand Total	
		Environment		Inspection		Kolkata		Mumbai		Bangalore			
		IR	Para	IR	Para	IR	Para	IR	Para	IR	Para	IR	Para
1.	Department of Atomic Energy	-	-	13	43	68	284	120	805	19	176	220	1308
2.	Department of Space	-	-	12	46	7	28	-	-	132	893	151	967
3.	Department of Scientific and Industrial Research	-	-	118	741	53	272	08	75	60	426	239	1514
4.	Department of Science and Technology	-	-	116	685	106	431	08	68	58	541	288	1725
5.	Department of Biotechnology	-	-	55	426	20	85	01	16	14	92	90	619
6.	Ministry of Earth Sciences	-	-	49	328	22	69	14	100	36	217	121	714
7.	Ministry of Environment, Forest and Climate Change	159	874	-	-	128	523	08	49	54	392	349	1838
8.	Ministry of New and Renewable Energy	43	311	-	-	-	-	01	03	05	51	49	365
Total		**202**	**1185**	**363**	**2269**	**404**	**1692**	**160**	**1116**	**378**	**2788**	**1507**	**9050**

Annexure 6

(Refer to Paras 1.11 and 1.12)

Summarised position of the Action Taken Notes (ATNs) awaited for the first time from various Ministries/Departments as of December 2024

Sl. No.	No. and Year of Report	Para No.	Para title	Date of laying in the Parliament	Delay in submission of ATNs
Department of Biotechnology					
1.	6 of 2020	14.2	Extra expenditure towards grant of allowances	23/09/2020	47 months 8 days
Department of Space					
2.	24 of 2023	2.2	Sub-optimum utilisation of the capacities of GSAT-18 Satellite.	09/02/2024	6 months 22 days
Department of Scientific and Industrial Research					
3.	24 of 2023	4.1	Deficient contract management leading to avoidable expenditure of ₹94.09 lakh.	09/02/2024	6 months 22 days
Department of Atomic Energy					
4.	24 of 2023	8.1	Functioning of Institute for Plasma Research	09/02/2024	6 months 22 days
Commercial Units					
Department of Atomic Energy					
1.	24 of 2023	8.2	Contract and Material Management in Nuclear Power Corporation of India Limited.	09/02/2024	6 months 22 days

Annexure 7

(Refer to Para 1.11)

Summarised position of Revised Action Taken Notes awaited from various Ministries/ Departments on which Audit has given comments/observations as of December 2024

Sl. No.	No. and Year of Report	Para No.	Para title	Date of issue of vetting comments on the ATN	Delay in submission of revised ATNs
Ministry of Environment, Forest and Climate Change					
1.	4 of 2022	Entire Report	Performance report on 'Conservation of Coastal Ecosystem'	8.8.2022	11 months 11 days (first vetting comment issued on 20.12.2023)
Department of Scientific and Industrial Research					
2.	2 of 2021	11.1	Functionality of IT Application System 'OneCSIR'	24.3.2021	6 months 28 days (first vetting comment issued on 3.6.2024)
3.	21 of 2022	4.1	Irregular grant of incentives and allowances	20.12.2022	13 months 14 days (first vetting comment issued on 17.11.23)

Annexure 8
(Refer Para 2.1.4.3)
Works awarded by nomination in Training Vertical

Sl. No.	Name of the Awardee	Name of the work	Total approved Budget *(₹ in crore)*
1	Sathguru Management Private Limited	Technology Transfer Training Programs	0.72
2	Sathguru Management Private Limited	Not available	0.78
3	Sathguru Management Private Limited	Organising One Advanced Technology Transfer Professionals Training Course, managing participation in other proposed programs and Registered Technology Transfer Professional certification	0.82
4	Biotech Consortium India Limited	Skill Development Training Programmes under NBM	3.85
5	Biotech Consortium India Limited	To organise 10 training programmes on Clinical Ethics and Environmental and Safety Management (Environment Awareness) for NBM through virtual platform	0.08
6	Clinical development services agency CDSA	To conduct training program on good clinical practice and bioethics for the Clinical Trial Network under NBM	0.37

Annexure 9
(Refer Para 2.1.4.4(ii)(c))
Unusual system for deciding the start date of projects

Sl. No.	Project	Observation
1.	'A Novel Vaccine for Chikungunya Virus Infection' by Bharat Biotech International Limited (Company)	The Grants-in-Aid Letter Agreement (GLA) of the project was entered on 22.3.2019. However, the date of the start of the project was decided as 3.7.2020, after more than a year of signing the GLA. It was observed from the Financial Due Diligence (FDD) report of the project that the applicant had claimed two invoices, both dated 20.5.2019, amounting to ₹1,08,560 and ₹4,04,470 respectively, which were before the start date fixed for the project. This expenditure was not allowed by BIRAC despite the applicant submitting that it had started working on the project immediately after the signing of the GLA.
2.	'Establishment of a world-class Process Development Lab and an Injectable fill finish facility for Biosimilar development and commercial Manufacturing' by MJ Biopharm Limited	The GLA was dated 19.10.2019. The SoPs for the management of Request for Proposals (RFPs) for the Grant-in-Aid (dated 30 July 2018) clearly stated that the date of start of the project was to be the date of signing of the Agreement. It was, however, observed (as in the case with other projects also) that the Agreement had undated signatures and the date of start of the Agreement (25 October 2019) was decided separately after signing the Agreement by NBM.
3.	'Development and Manufacturing of Slip ring, useful for Diagnostic CT and Ring gantry-based Radiotherapy equipment' by M/s Panacea Medical Technologies Pvt. Ltd.	The SoPs for the management of RFPs for the Grant-in-Aid (dated 30 July 2018) clearly stated that the date of start of the project was to be the date of signing of the Agreement. It was, however, observed that the Agreement had undated signatures, the letter was dated 30 August 2018 and the date of start of the Agreement (7 December 2018) was decided separately after signing the Agreement by NBM.
4.	'Pembrolizumab Biosimilar' by M/s Oncosimis Biotech Private Limited	The SoPs for the management of RFPs for the Grant-in-Aid (dated 30 July 2018) clearly stated that the date of start of the project was to be the date of signing of the agreement. It was however, observed that as was the case with other projects also, the Agreement had undated signatures, the Agreement was signed on 1.10.2019 and the project start date was separately decided to be 5.10.2019 which was irregular.
5.	'Immunotherapy of COVID infected patients using therapeutic antibodies from Human or Equine sources' by Virchow Biotech Private Limited.	The GLA of the project 'Immunotherapy of COVID infected patients using therapeutic antibodies from Human or Equine sources' was signed on 21.5.20, however, NBM-BIRAC decided that the date of project start would be 2.6.20.

Annexure 10
(Refer Para 2.1.4.4(ii)(d))
Delays in implementation of Projects

Sl. No.	Project name and cost	Grant released *(₹ in crore)*	Start date	Sanctioned duration	Delay (till March 2024)	Project status
1	'Production of safe and effective oral cholera vaccine of global GMP standards in India through Industry Academia partnership to meet India's supply needs', submitted by BIBCOL and THSTI.'	11.40	27 Feb 2019	26 months	36 months	No technical milestone was achieved in the project. Last extension was granted till 24 Jan 2024.
2	'A Novel Vaccine for Chikungunya Virus Infection' by Bharat Biotech International Limited	10.47	3 Jul 2020	28 months	16 months	The project was granted an extension till May 2023.
3	'Establishment of a world-class Process Development Lab and an Injectable fill finish facility for Biosimilar development and commercial Manufacturing' by MJ Biopharm Limited	25.49	9 Oct 2019	36 months	17 months	Milestones were incomplete till the time of audit field visit on 13 October 2023.
4	Vaccine to prevent and control COVID-19 by M/s Aurobindo Pharma Ltd.	3.60	2 Sept 2020	15 months	12 months	Foreclosed on 7 February 2022
5	Pembrolizumab Biosimilar by M/s Oncosimis Biotech Limited	2.61	5 Oct 2019	24 months	29 months	Incomplete: last extension was granted till July 2023
6	Product development of in-house developed Insulin Glargine towards commercialisation, submitted by Stelis Biopharma Pvt. Ltd	5.95	29 Oct 2019	36 months	17 months	The project was proposed to be foreclosed as per the field visit dated November 2023, however, the same was not formally closed till March 2024.

Sl. No.	Project name and cost	Grant released *(₹ in crore)*	Start date	Sanctioned duration	Delay (till March 2024)	Project status
						BIRAC has informed (February 2025) that the work in the project was already at a halt at that time, as the grantee did not want to continue the project. Final orders (with refund amount as applicable) will be issued after the Financial Due Diligence, which has been completed and a few queries from the consultant are pending reply from the team. The project will be closed thereafter as per the process and norms.
7	Plasma fractionation process for production of albumin, immunoglobulin and other products for therapeutic uses by M/s BIBCOL and NII	2.80	14 Mar 2019	12 months	48 months	Project objectives were not achieved and the project was not formally closed till March 2024. In their response (February 2025), BIRAC has informed that NBM has written to BIBCOL several times (3 reminders) for the refund of the amount (₹2.31 lakh). The PI has raised this to their management, but the refund has not been received yet. The issue is being followed up on at a higher level.
8	First-in-India GMP-grade plasmid and viral vector manufacturing for CAR-T and other gene therapies	12.47	15 Mar 2021	24 months	12 months	The project is yet to be closed, although recommended by Scientific Advisory Committee recommended its closure on 23 August 2023. BIRAC's response (February 2025) is silent on the current status of the project.

Annexure 11

(Refer Para 2.1.4.5(i)(a))

Steering Committee (SC) recommendations not followed (excluding four cases mentioned in the main report)

Sl. No.	SC Recommendations not followed	Reply and remarks
1.	To develop a road map for the next five years, which lists out what is the forecast for the new products to be developed so that the regulatory system can be geared up to meet future requirements. (SC meeting dated 29.8.2017)	While accepting the audit observation, BIRAC, in its reply (February 2025), stated that the suggestion shall be implemented in the residual period.
2.	An expert panel/intelligence unit should support the TAG to solicit scientific inputs for developing effective strategies for product development, setting up of requisite infrastructure and training. The inputs for this panel should also be solicited from the experts in the industry. (SC meeting dated 29.8.2017)	In its reply (February 2025), BIRAC has stated that NBM has solicited inputs from industry experts at various occasions (external experts, not part of committees) to support the SAG and TAG in developing strategies. It has been further assured that BIRAC has noted the suggestions for implementation in the future period.
3.	Most of the proposals submitted by the industry did not show innovation in the development of clones or the process of manufacture in the case of Biosimilars. (SC meeting 18 December 2018)	In its reply (February 2025) stated that three projects were supported under the Mission for indigenous development, out of which two had been completed. It further stated that the Mission has supported IIT Delhi for a continuous manufacturing process platform for biosimilars. However, the fact remains that these initiatives did not address the innovation aspect of the projects.
4.	In-depth health technology assessment for the proposals being considered. Market analysis of needs and quality of products to be ascertained. For mAbs, expertise in cell line development is to be brought. (SC meeting 18 December 2018)	BIRAC's reply (February 2025) did not address these recommendations. However, it also stated that it had noted the audit suggestions for the future residual period of the Mission.
5.	Efforts should be made to address challenges, which may include seeking the support of international experts. Any capacity created should be adequately usable, capacity development without an application goal is not the purpose. A revised RFP may be developed after adequate discussion. (SC meeting 18 December 2018)	BIRAC replied (February 2025) that NBM will soon launch RFP on ISO 13485:2016 (Implementation training and Internal Audit related awareness) certification trainings for medical devices. The reply was silent about the remaining audit observations.
6.	It is important to continuously perform landscape analysis and identify gaps. (SC meeting 18 December 2018)	While accepting the audit observations (February 2025), BIRAC stated that the landscaping reports were prepared. However, the details of the same could not be verified by Audit.
7.	There were concerns regarding the limited engagement of the National Biopharma Mission with regulatory agencies. Hiring a regulatory consultant to identify products that are in the pipeline and need regulatory support. (SC meeting 18 December 2018)	While accepting the audit observations (February 2025), BIRAC stated that improvements had been noted for future compliance.

Sl. No.	SC Recommendations not followed	Reply and remarks
8.	Regular meetings should happen between DOP, DBT, MoH and ICMR (SC meeting 18 December 2018)	While accepting the audit observations (February 2025), BIRAC stated that improvements had been noted for future compliance.
9.	The Mission should be aware of hubs being created under DST and ICMR. The Mission may seek information on the currently active GLP facilities being supported by DST. Synergistic efforts are required with other ministries and DST. The MoU between TDB, DST and BIRAC should be activated. (SC meeting 18 December 2018)	While accepting the audit observations (February 2025), BIRAC stated that improvements had been noted for future compliance.
10.	To support consortia, facilities and training linked to product development (ATR listed in the SC minutes dated 18 December 2018)	While accepting the audit observations (February 2025), BIRAC stated that two training RFPs were published in December 2024.
11.	Landscaping of the institutes/companies based on their core strength and stage of product development should also be done. Business model, risk analysis and sustainability studies to be done. (ATR listed in the SC minutes dated 18 December 2018)	BIRAC replied (February 2025) that the landscaping reports conducted at various stages were enclosed. However, the said details were not provided.
12.	To support the industrial product development academia-industry connections should be established for knowledge generation under Medical Devices. A new funding mechanism where industry can give research contracts to academia may be developed. (ATR listed in the SC minutes dated 18 December 2018)	While accepting the audit observations (February 2025) BIRAC stated that improvements were noted for future compliance.
13.	SAG members should connect the Mission team to appropriate networks to create value for the fund recipients. (SC meeting 18 December 2018)	BIRAC replied (February 2025) for various projects SAG members connected the Mission team to appropriate networks. However, the details of `such connections were not furnished.
14.	In-licensing of technologies by BIRAC. (SC meeting dated 20 December 2019)	Audit observed that only Cholera vaccine technology was in-licensed by BIRAC. No reply to this observation was furnished by BIRAC.
15.	Establishment of a biomanufacturing cluster for early product availability (SC meeting dated 20 December 2019)	BIRAC in its reply (February 2025) has assured that cluster are planned to be established under BioE3 policy and programmes.
16.	Adoption of stringent monitoring systems. Efforts to recognise performers and encourage interactions between the grantees. (SC meeting dated 20 December 2019)	The recommendations for forming the interlinkages, which was also one of the prime mission objectives, was not followed on. BIRAC mentioned in its reply (February 2025) that a few examples had been enclosed (with the reply), however, the details of the same were not furnished.

Annexure 12
(Refer Para 2.1.4.5(i)(b))
TAG recommendations not followed

Sl. No.	TAG Recommendations not followed	Audit Comments
1.	Project: CTN for Dengue and Chikungunya –to further prepare sites for GCP-compliant field-based clinical trials (TAG meeting dated 29.1.2020)	
	1. To follow a common laboratory algorithm for AFI surveillance at all the sites and to develop a protocol for a common laboratory algorithm. 2. To perform all the PRNT assays at IRSHA, Pune 3. Allocation of funds for storage of samples at a centrally identified facility for storage of samples. 4. Development of quantifiable indicators identified by each grantee to measure community engagement. 5. Production of the year-wise breakup of the Vaccine developers contacted by each of the grantees. To sign a formal MoU between the software provider (INCLEN), NBM-BIRAC and the sites after project initiation.	None of these recommendations was followed up on. The response of BIRAC (February 2025) did not address the reasons for not following up on the recommendations.
2.	Project: CTN for Dengue and Chikungunya – to have a complete geographical representation of potential trial sites (TAG meeting dated 29.1.2020)	
	1. Copies of EC approvals for initiating demographic data collection and longitudinal incidence study together. 2. Performance of all PRNT assays at IRSHA, Pune. 3. All the sites should follow a common laboratory algorithm for AFI surveillance. 4. GCP compliance at all the grantee sites. Copies of the MoU signed between the software provider (INCLEN), NBM-BIRAC and the sites after project initiation.	The response of BIRAC (February 2025) did not detail the reasons for not following up on the recommendations.
3.	Project: PDL-GMP facility at Gennova (TAG meeting dated 20.6.2019)	
	1. To ensure that the facility time was blocked for the end user 2. To ensure fair and competitive charges for the facility from the end user. 3. To ensure that the service requests received at the Gennova facility can be logged on for traceability and timely response to the user. 4. To track and ensure the progress of the outside projects. 5. Obtain a minimum of ten years of service commitment from Gennova. 6. Fair access to a minimum of 30 *per cent* of the capacity of the facility to be provided.	BIRAC has assured (February 2025) that the comments have been noted and will be pursued going forward. It has further stated that the Gennova site visit was conducted in October 2024. The team has committed to reserve 30% of facility space for start-ups and the discussions are underway to formalise the same. However, the fact remains that the recommendations were made back in June 2019 and the final compliance is yet to be done.

Sl. No.	TAG Recommendations not followed	Audit Comments
4.	Project: Cell Line Repository at NCCS (TAG meeting dated 20.6.2019 and TAG meeting dated 31.8.2020)	
	Reappropriation of the travel funds for training the NCCS staff at overseas institutes or organisations.	BIRAC has informed that (February 2025) the project at NCCS is in progress and the travel funds are planned to be utilised. The reply needs to be seen in the light of the fact that these recommendations are pending compliance since June 2019.
5.	Project: IT Platform for QMS (TAG meeting dated 31.8.2020)	
	To make LIMS and ELN available to Indian Biotech Startups and Entrepreneurs at differential prices.	Although BIRAC has informed that (February 2025) the recommendation has been followed and several Indian Biotech start-ups have been connected to the company, but the pricing details were not furnished.
6.	Project: Slip ring for diagnostic CT and ring gantry-based radiotherapy equipment	
	To examine the market potential of slip rings and the business model of the company.	Although BIRAC has informed that (February 2025) landscaping was done and expert opinion was taken but the details of the same were not furnished.
7.	Project: NCIT at IRSHA (TAG MoM dated 22.11.2018)	
	1. Dengue PRNT50 validation with a well-established and recognised international lab like CDC/NIH/NIBSC. 2. NBM-BIRAC to support the training of personnel at any of the above-mentioned or any other referral/recognised labs if needed. Formation of a PMC with members from NIH/WHO.	PRNT50 (Plaque Reduction Neutralisation Test 50) validation was essential for assessing vaccine efficacy, standardising assay procedures, ensuring quality control in vaccine production, identifying correlates of protection, monitoring population immunity, evaluating antiviral therapies, determining clinical trial endpoints and complying with regulatory requirements in virology and vaccine development. However, the same was not followed up. Regarding the inclusion of the members from NIH/WHO in the PMC, BIRAC has responded (February 2025) that some of the best-known vaccine experts in our SAG committee include several international experts. However, the fact remains that the recommendations were for the formation of the Project Monitoring Committee, which are specific to the project and thus, the role of these members are different from the SAG Committee, which provides overall direction to the projects under a particular vertical.
8.	Project: Chikungunya vaccine by BBIL	
	Formation of a separate panel on behalf of SAG and TAG to monitor the BBIL Phase II CT apart from PMC. The panel was to consist of experts with regulatory assay experience.	The reply of BIRAC (February 2025) was silent about the formation of a separate panel.
9.	Project: General recommendations on GLP Analytical Labs (TAG meeting dated 20.6.2019)	

Sl. No.	TAG Recommendations not followed	Audit Comments
	1. To ensure that all the GLP analytical labs supported under the Mission have a common governance model. 2. Appointment of a BIRAC representative in the governance council of each of the GLP Analytical Labs. 3. Online tracking of requests for services. 4. Detailed list of the GLP Analytical Labs manpower trained at international facilities to adopt best practices. 5. Incorporation of clauses under all the GLAs that the revenue generated should be used towards the sustainability of the facility after the grant period.	None of the recommendations were followed up. BIRAC has responded that (February 2025) there is a similar Governance model vetted by BIRAC's legal and Finance division and incorporated in all NBM facilities as a separate schedule of all GLAs of Facilities and the differential pricing is reviewed by BIRAC. The response is to be viewed in the light of the fact that the recommendations pertained to the analytical labs and BIRAC representation in their governance, while the response submitted is regarding the governance model of the Mission at BIRAC. BIRAC replied (February 2025) that the online tracking portal is under consideration for development and it has noted other observations for future compliance.
10.	Project: Centre for Biopharma Analysis by EDC, Pune (TAG meeting dated 20.6.2019)	
	1. Appointment of an independent consultant for independent monitoring and reporting to BIRAC. 2. Inclusion of clauses in the GLA to ensure that the role of BIRAC in the governance structure will be continued even after the project is completed.	Except for one project at M/s Palamuar Hyderabad, Audit did not find any other projects under the Mission having clauses in the GLA for ensuring the role of BIRAC in the governance of the grantee bodies. The reply of BIRAC (February 2025) was irrelevant.
11.	Project: GLP-compliant analytical facility at CSIR-IICT by CSIR-IICT (TAG meeting dated 20.6.2019)	
	To ensure that the business model of the facility works towards sustainability and viability and to discuss the facility establishment under NBM with DG CSIR.	The recommendations were not followed up. BIRAC has replied that (February 2025) IICT facility-generated revenue was discussed in SAG meetings. Audit noted that the reply was irrelevant.
12.	Project: A low-cost multipowered multifunctional neonatal breathing support device for low-resource settings by InnAccel Pvt. Ltd. (TAG meeting dated16.4.2020)	
	1. The details of the multicentric clinical study were undertaken to generate data and support the product commercially. 2. Steps taken to indigenise the product in view of the components, like imported sensors being used in the device.	The recommendation was in sync with one of the main motives of the projects to innovate and make in India. However, the recommendation was overlooked. While confirming the observation, BIRAC informed (May 2024) that the recommendation was made before sanctioning the project, but it was not included under the main project objectives in the GLA.
13.	Project: Study for safety and efficacy of VELGRAFT as a skin substitute on wounds of Diabetic foot ulcers by Datt Mediproducts Ltd. (TAG meeting dated16.4.2020)	
	1. To ensure the quality check maintenance by the applicant on the commercially purchased donor bone marrow. 2. To ensure non-inferiority of the clinical trials performed by the applicant with any comparator arm of the standard care of treatment.	The recommendations were not followed up. BIRAC's reply (February 2025) detailed the source of purchase of donor bone marrow and general precautions taken by the grantee. However, the reply was silent about the specific actions taken to ensure the follow-up of the TAG recommendation.

Sl. No.	TAG Recommendations not followed	Audit Comments
14.	Project: Flexible cGMP facility at Navya Biologicals Pvt. Ltd. (Shilpa Medicare Ltd. Biologics Unit 5) (TAG meeting dated 17.3.2018)	
	Firewalling system at the facility.	BIRAC replied (February 2025) that the services provided by the NBM-funded part of the facility are provided separately to BIRAC. However, the fact remains that this does not take care of firewalling.
15.	Project: Biotherapeutics: Facilities (TAG Meeting dated 17.3.2018)	
	To study models of collaboration for facility usage, especially service models to manage the conflicts of the grantee with the parent organisation.	BIRAC replied (February 2025) that, based on earlier funded BIRAC facilities through other schemes and lessons learnt, the Facility Governance model was integrated into NBM GLAs and that this will be looked into. It further stated that the survey of existing facilities was conducted initially. However, the fact remains that the specific recommendation of TAG was not followed up.
16.	Project: Indigenous autologous anti CD-19 CAR T cell therapy for leukaemia and lymphomas by Intas Pharma Ltd. and TMC, Kolkata (TAG meeting dated 30.4.2020)	
	To insert the clause in the agreement with the grantee to ensure affordability in the CAR-T manufacturing process.	BIRAC replied (February 2025) that GLA schedule IV states the affordability clause. Audit noted that the said clause, which stated that 'project developments/new IP should be made available and accessible at an affordable price to people most in need within developing countries', was neither specific nor binding on the grantee to ensure that the recommendation is implemented.
17.	Project: 15-valent pneumococcal polysaccharides by Tergene Biotech Pvt. Ltd. (TAG meeting dated 29.1.2020 and TAG meeting dated 28.5.2020)	
	1. To make the vaccine accessible to the public after Phase III CT. 2. Inclusion of the agreement protecting BIRAC from patent infringement and to make Tergene ensure the availability of the vaccine after completion of trials. 3. A plan for clinical immunogenicity evaluation (ELISA and OPA assays) at KIMS GCLP laboratory, supported under NBM, was to be submitted by the grantee.	The recommendation could have ensured that the vaccine remained accessible to the public even after the Mission's exit Clinical immunogenicity evaluation using ELISA and OPA assays is essential for ensuring the safety, efficacy and regulatory compliance of therapeutic proteins, vaccines and biologics, both during clinical development and post-marketing. However, the recommendation was not followed up on. The reply furnished by BIRAC (February 2025) is silent on the follow-up action taken on this recommendation.
18.	Project: Protein L affinity raising by Vcare Biolabs Pvt. Ltd. (TAG meeting dated 27.7.2020)	
	Pairing the grantee with companies to use protein L for their process and validation.	Discussed in the main report under 'Establishment of interlinkages'

Sl. No.	TAG Recommendations not followed	Audit Comments
19.	Project: Phase II/III CT of hepatitis E vaccine by JIPMER (TAG meeting dated 1.9.2020)	
	1. Engagement of an external expert committee to guide and handhold the TRC. 2. Facilitation of the transfer of the assay from THSTI to Shiv Nadar University	In their reply (February 2025), BIRAC accepted that no committee was formed and has asserted that the consortia members are experts in the field themselves. Also, regarding the facilitation of the transfer of the assay, it was stated that the grantee team did not show willingness for this part, affirming the observation that the Mission was unable to facilitate such interlinkages.
20.	Project: Multistage malaria vaccine by RMRC Bhubaneswar (TAG meeting dated 1.9.2020 and TAG meeting dated 26.11.2020)	
	1. To generate more proof-of-principle data in the mouse model. 2. Nomination of the Directors of RMRC, NII or ICMR to the board of MVDP. 3. Engagement of an external expert committee to guide and handhold the TRC.	BIRAC stated (February 2025) that the generation of more proof-of-principle data in mouse models is in progress. The reply needs to be viewed in light of the fact that the recommendation was made more than four years ago. The reply was silent about the recommendations at Sl. No. 2 and 3.
21.	Project: Mandibular bone augmentation (TAG meeting dated 27.7.2020 and TAG meeting dated 26.11.2020)	
	To adopt a Go/No-go criterion based on the completion of the objective	The project was ongoing at the time of completing the field audit (January 2024). The deliberation over the Go/No-go criterion was not found in the records furnished to Audit. No reply was furnished to this observation.
22.	Project: Evaluation of FlexiOH in emergency settings	
	1. Production of objective clinical data of the grantee on the performance of the FlexiOH as a definitive cast for the treatment of different forearm fractures. 2. Vetting and review of the clinical investigational trial plan/protocol by an expert subcommittee. Getting the CT approved by the institutional ethics committee.	BIRAC has replied (February 2025) that the project is monitored by SAG, including clinical experts, who are often invited to SAG as special invitees. However, the fact remains that an expert subcommittee did not vet and review the Clinical Investigation Trial and the Clinical Trial was not got approved by the institutional ethics committee.

Annexure 13
(Refer Para 2.1.4.5(ii))
Lack of Monitoring

Sl. No.	Project	Observations	Reply
1.	To develop a safe, immunogenic and stable vaccine for all populations against the novel coronavirus COVID-19, which is affordable and accessible for all countries by M/s Biological E.	a) As per financial due diligence (FDD) completed in September 2021 by a financial expert, a No-lien account was not opened by the applicant. However, as per the records, the applicant had opened a No-lien bank account No. 05110200000049 in Bank of Baroda. Thus, FDD conducted by the empanelled CA was not reliable or based on facts. b) The bank account statement was not provided to the CA who conducted the FDD. Therefore, the expenditure out of the NBM Grant and company contribution could not be verified. c) SoE and other related vouchers pertaining to the expenses of ₹1.45 crore were not scrutinised at NBM to ensure that the expenses were actually incurred for the project.	BIRAC, while reiterating the facts (February 2025), stated that a response by the grantee to the observations of the FDD consultant was submitted, consequent to which the observation itself was closed. Audit noted that the reply did not clarify the reasons for such closure. Also, BIRAC did not respond to the audit observation on CA's wrong observation about non-operation of the no-lien account and the reply was silent about monitoring done at the PMU level at BIRAC.
2.	Process development and commercialisation of Recombinant Human Albumin by Lazuline Biotech Private Limited	Against the total expenditure of ₹9.30 crore incurred under the project, the company did not spend its share of ₹6.72 crore through a no-lien account as stipulated under the conditions of GLA. BIRAC regularised this violation in view of the recommendations of the CA who did the FDD. SoE and other related vouchers pertaining to these expenses were not scrutinised by BIRAC to ensure that the expenses were actually incurred for the project	BIRAC did not furnish a reply to this observation.
3.	'Phase III Clinical Trial- Comparative Study to Test the Non-Inferiority of Biosimilar Liraglutide manufactured by Novo Nordisk in Patients with Type 2 Diabetes Mellitus' from Levim Biotech LLP (Company)	According to the GLA, company's contribution for the first milestone was ₹67.73 lakh. However, as per UC and SOE for the period from 1 October 2019 to 31 March 2020, grantee did not contribute and the project was being run on BIRAC funds. UC and SOE for the period from 1 April 2020 to 30 September 2020 revealed that the company made its first contribution of ₹67.73 lakh at the time of release of the second milestone amount of ₹413.63 lakh by BIRAC. Further, till the completion of second milestone, the company had contributed only ₹67.73 lakh (only first instalment), instead of the stipulated ₹112.88 lakh. Although the project was slated to be completed by 15 September 2021 and the company was required to apply for the approval of any extension by 15 June 2021 (three months before stipulated completion date), audit observed that the no-cost extension was granted to the project one month after the stipulated completion date on 31 October 2021. This extension was granted till 14 September 2022.	BIRAC did not furnish a reply to this observation.

Sl. No.	Project	Observations	Reply
		Similarly, another 10 months no-cost extension was granted to the project on 2 November 2022, one and a half months after the expiry of extension granted earlier. This extension was granted till 30 June 2023. The grantee was allowed to incur an expenditure of ₹29.31 lakh against sanction budget of ₹24 lakh under the manpower head. It was also observed that there was re-allocation of grant from consumables to manpower to the tune of ₹16 lakh. As per the TAG meeting of 13 September 2023, an additional budget of ₹2.44 crore to the applicant under 'Outsourcing' head towards additional expenditure incurred for indigenous development of pen drive and phase IV trials. Audit observed that these additional expenditures were neither covered under GLA originally signed nor were these budget requirements validated by the experts.	
4.	Plasma fractionation process for production of albumin, immunoglobulin and other products for therapeutic uses by BIBCOL and NII.	SoE and other related vouchers pertaining to these expenses were not scrutinised by BIRAC to ensure that the expenses were actually incurred for the project. Documents in support of the expenses incurred by the company, totalling to ₹2.83 crore, were not shared with audit.	BIRAC did not furnish a reply to this observation.
5.	Phase III, double blind, randomised placebo-controlled study to evaluate the duration of acute respiratory symptoms among exposed high-risk population during COVID-19 pandemic by enhanced trained immune response through VPM1002 rBCG vaccine- by Serum Institute of India.	Grantee was allowed to operate the project expenses outside of the no-lien account in violation of the terms and conditions of the GLA signed.	BIRAC (February 2025) stated that the bank transactions details were shared by the grantee and the observation on non-operation of the no-lien account was closed. The reply however did not detail the reasons for such closure and the remedial actions taken to prevent such violations in the future.
6.	CAPS facility by Syngene International Limited	A no-lien account is maintained at CAPS facility but expenses for the project were not met from the same. The expenses were booked outside the no-lien account and then booked in the project account separately which was in violation of the terms and conditions of GLA.	BIRAC (February 2025) stated that deviation was observed and it was rectified later by the grantee. The reply however was silent on the details of such rectification.

Sl. No.	Project	Observations	Reply
7.	To scale up manufacturing of Patho Detect 2019-nCOV Detection kit rapidly to meet the current demand in India during 'National Crisis' by Mylab Discovery Solutions Private Ltd.	The company did not route its own contribution of ₹6.15 crore through no lien separate bank account, in violation of the conditions of GLA.	BIRAC (February 2025) stated that deviation was addressed later by the grantee. However, no further details about the same were shared.
8.	Shared facility by Palamur Bioscience Pvt Ltd	The GLA had mandated that the Governing body of the company should have representatives from BIRAC. However, no BIRAC representative was appointed to the Governing Body.	BIRAC (February 2025) while accepting that the governance committee was not formed stated that the clause was uniform and incorporated in all shared facility GLAs. The reply needs to be seen in light of the fact that representatives from BIRAC were not observed to be on the Governing Body of such companies despite the presence of such clause in the GLA.

Annexure 14

(Refer to Para 3.3)

Avoidable payment of water charges due to non-installation of Rainwater Harvesting System and Wastewater Recycling Facility

Sl. No.	Year	Total bill amount by Delhi Jal Board *(in ₹)*	Rebate at the rate of 10 *per cent* on the total bill in case of Rainwater Harvesting structure *(in ₹)*	Rebate at the rate of 15 *per cent* on the total bill in case of Rainwater Harvesting structure + Wastewater recycling facility *(in ₹)*
1.	2013-14	3528399	352840	529260
2.	2014-15	7389005	738901	1108351
3.	2015-16	6863195	686320	1029479
4.	2016-17	7228955	722896	1084343
5.	2017-18	5556542	555654	833481
6.	2018-19	6032614	603261	904892
7.	2019-20	5844436	584444	876665
8.	2020-21	5669416	566942	850412
9.	2021-22	6549472	654947	982421
10.	2022-23	5930440	593044	889566
11.	2023-24	10210977	1021098	1531647
12.	2024-25 (upto Aug 24)	5433139	543314	814971
	Total	**76236590**	**7623659**	**11435489**

Note- Water bills pertaining to January 2014, December 2014, December 2019 and December 2022 were not furnished by National Physical Laboratory.

Annexure 15
(Refer Para 4.2)
Total manpower and aviation support service cost for Nanded Airport

Sl No	Year	Actual Salary and Other Expenditure	Aviation Support Service	Service Tax/GST @18%	Total *(in ₹)*
1	2010 to 2015	-	-	7,34,854	7,34,854
2	March 2017	80,418	2,49,404	59,368	3,89,190
3	April 2017 to March 2018	18,09,061	29,92,848	8,64,344	56,66,253
4	April 2018 to March 2019	23,69,581	32,31,679	10,08,226	66,09,486
5	April 2019 to March 2020	39,78,963	32,31,679	12,97,916	85,08,558
6	April 2020 to March 2021	21,98,753	36,75,466	10,57,360	69,31,579
7	April 2021 to March 2022	21,87,405	36,75,468	10,55,312	69,18,185
8	April 2022 to March 2023	24,27,776	40,50,732	11,66,130	76,44,638
9	April 2023 to March 2024	24,22,165	42,96,041	12,09,278	79,27,484
	Total	**1,74,74,122**	**2,54,03,317**	**84,52,788**	**5,13,30,227**

Annexure 16
(Refer Para 4.2)
Total manpower and aviation support service cost for Sindhudurg Airport

Sl. No.	Year	Actual Salary and Other Expenditure	Aviation Support Service	GST@18%	Total *(in ₹)*
1	January 2021 to September 2021	12,82,957	-	2,30,932	15,13,889
2	October 2021 to March 2022	13,54,025	18,37,734	5,74,516	37,66,275
3	April 2022 to January 2023	24,10,772	33,75,610	10,41,548	68,27,930
4	February 2023	2,44,710	3,37,561	1,04,808	6,87,079
5	March 2023	2,44,710	3,37,561	1,04,808	6,87,079
6	April 2023	2,71,398	3,37,561	1,09,612	7,18,571
7	May 2023 to March 2024	22,15,804	39,38,038	11,07,692	72,61,534
	Total	**8,02,4376**	**1,01,64,065**	**32,73,916**	**2,14,62,357**

Annexure 17
(Refer Para 5.1.2.1(a))
Action taken by the Ministry on the States

Sl. No.	Name of States	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
		Target	Actual		
1.	Kerala	2012	Not published	Proposed to be published in March 2017.	Published in 2019
2.	Uttar Pradesh	2012	Not published	Two volumes on the fauna of Uttar Pradesh were published in 2015.	--
3.	Himachal Pradesh	2014	Not published	Proposed to be published in March 2018.	Published in 2021.
4.	Chandigarh	2012	Not published	Proposed to be published in March 2018.	Not submitted by the authors to the Publication Division for printing process.
5.	Haryana	2014	Not published	Proposed to be published in March 2018.	Published in 2020.

Annexure 18

(Refer Para 5.1.2.1(a))

Targets and achievements of Zoological Survey of India in surveys, studies conducted and publications brought out in the States

Sl. No.	Name of the State	Surveys conducted		Studies conducted		Publications brought out		Comments of ZSI (October and November 2024)	Audit Comments
		Target	Actual	Target	Actual	Target	Actual		
1.	Assam	2015	2017	2018	Not available	2020	2023	--	Publication has been delayed by three years from the scheduled time.
2.	Jammu and Kashmir	2014	2018	2017		2020	Not published	Not submitted by the authors in the Publication Division for the printing process.	Publication could not be brought out.
3.	Punjab	2016	2016	2018		2020	2019	--	--
4.	Bihar	2016	2021-24	2018		2020	Not published	Manuscript submitted on 16 October 2024 and 9 April 2021 respectively. Processed for publication and scheduled to be printed in 2025.	Publication as per the target of PAC could not be brought out.
5.	Jharkhand	2016	2014-17	2018		2020			

Summary Statistics

Publication of the research output was brought out for only two States: Sl. No.1-Assam and 3-Punjab

Annexure 19
(Refer Para 5.1.2.1(a))
Action taken by the Ministry on Ecosystems

Kind of Ecosystem	Sl. No.	Name of Ecosystems	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
			Target	Actual		
Desert	1.	Rajasthan	2007	Not published	ZSI has taken up the surveys in 'Rajasthan and Gujarat- Studies on Faunal Diversity of Rajasthan- Gaps in Research' and 'Studies on Faunal Diversity of Dry Grasslands of the Thar Desert' during 2013-2016.	Published and printed in 2024.
	2.	Gujarat	2012	Not published		Faunal Diversity of Desert Biogeographic Zone was published in 2021, wherein the faunal information of Gujarat, *i.e.,* Kutch, has been incorporated. Published in 2021.
Marine and Island	3.	Andaman and Nicobar	2014	Not published	Under the State Fauna Series, the Fauna of Andaman and Nicobar was published in one volume during 2010. However, since there are arrays of ecosystems in Andaman and Nicobar, surveys were undertaken in Andaman and Nicobar as part of the Ecosystem Series.	Published in 2017.
	4.	East Coast: Andhra Pradesh	2010	Not published	Proposed to be published during 2013-2016.	Fauna of Coasts of India was published in 2020, in which the coastal and marine fauna of East Coast of Odisha has been included.
	5.	East Coast: Orissa	2014	Not published		
	6.	West Coast: Kerala	2014	Not published	Proposed to be published in March 2017.	
Tropical Rain Forest	7.	Western Ghats: Kerala	2011	Not published	Proposed to be published in March 2018.	Faunal Diversity of Desert Biogeographic Zone has been published in 2021 wherein the faunal information of Gujarat, *i.e.,* Kutch has been incorporated. Published in 2021.
	8.	Western Ghats: Tamil Nadu	2011	Not published		
	9.	Western Ghats: Karnataka	2013	Not published		Fauna of Western Ghats Biogeographic Zone India was published in 2020, wherein the faunal information of Tropical Rain Forest Ecosystem (Western Ghats, Kerala, Tamil Nadu) been incorporated.
Estuarine	10.	Cauvery Estuary, Tamil Nadu	2011	Not published	Proposed to be published in March 2018.	Published in 2022
	11.	Pennar Estuary, Andhra Pradesh	2014	Not published		Not submitted by the authors in the Publication Division for printing process.

Kind of Ecosystem	Sl. No.	Name of Ecosystems	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
			Target	Actual		
Fresh water	12.	Nalsarovar, Gujarat	2007	Not published	The survey on the Freshwater Ecosystem-Fauna of Bhoj Wetland was undertaken jointly by FBRC of ZSI, Hyderabad and CZRC of ZSI, Jabalpur and the taxonomic studies are being done. The publication on the Freshwater Ecosystem-Fauna of Bhoj Wetland will be published by March 2018. As per the CAG's observations, the MBRC of ZSI, Chennai, WGRC of ZSI, Calicut and FBRC of ZSI, Hyderabad, along with ZSI HQ, Kolkata, have been undertaking surveys in Freshwater Ecosystem 'Sasthamkotta' in Kerala during 2016-2019. The taxonomic studies on collection of fauna from Freshwater Ecosystem – Sasthamkotta will be undertaken during 2018-19 and Fauna of Freshwater Ecosystem – Sasthamkotta will be published by March 2018.	Published in 2009
	13.	Crater Lake, Maharashtra	2009	Not published		Not submitted by the authors in the Publication Division for printing process.
	14.	Govind Sagar, Punjab	2008	Not published		ZSI brought out one publication on Govind Sagar as a research paper published in 2015.
	15.	Chandratal, Himachal Pradesh	2008	Not published		Faunal Diversity on Ramsar Wetlands of India has been published in 2021 in which faunal information on Chadratal Lake, Himachal Pradesh has been incorporated.
	16.	East Kolkata Wetlands	2008	Not published		Published in 2020.
	17.	Tso Moriri, Jammu and Kashmir	2010	Not published		Faunal Diversity on Ramsar Wetlands of India has been published in 2021 in which faunal information on Tso Morai/Tso Moriri (now in Ladakh UT) has been incorporated.
	18.	Bhoj, Madhya Pradesh	2013	Not published		Published in 2020.
	19.	Keoladeo Ghana, Rajasthan	2013	Not published		Published in 2021.
	20.	Ropar, Punjab	2012	Not published		Published in 2023.
	21.	Narayan Sarovar	2013	Not published		Published and printed in 2024

Summary statistics:

a. Publications were completed for 19 ecosystems- Sl. No.1 to 10, 12 and 14 to 21

b. Authors did not submit the printing material/manuscript to the publication division- Sl.No.11 and 13

c. The delay in publication has been running for more than six years. No.11 and 13

Annexure 20

Refer Para 5.1.2.1(a)

Targets and achievements of Zoological Survey of India in surveys, studies conducted and publications brought out in Ecosystems

Kind of ecosystem	Sl. No.	Name of the ecosystem	Surveys conducted		Studies conducted		Publications brought out		Comments of ZSI (October and November 2024)	Audit Comments
			Target	Actual	Target	Actual	Target	Actual		
Himalayan Ecosystem	1	Western Himalayas: Zanskar Valley (J&K)	2014	Not Available	2016	Not furnished	2018	--	Not submitted by the authors to the Publication Division for the printing process.	ZSI could not provide the period of survey conducted.
Marine and Island Ecosystem	2	Lakshadweep	2016	2017-2020	2018		2020	2024	Published and printed in 2024.	Publication has been delayed by four years from the scheduled time.
	3	East Coast: West Bengal	2016	2013-2016	2018		2020	2020	--	--
	4	West Coast: Karnataka/Goa	2016	2011-2014	2018		2020			
	5	West Coast: Maharashtra/ Gujarat	2016		2018		2020			
Tropical Rain Forest Ecosystem	6	Western Ghats: Goa/Maharashtra/ Gujarat	2013	2013-2017	2015		2017	2020	--	--
	7	Eastern Himalaya	2015	2015-2018	2018		2020	2018		
Estuarine Ecosystem	8	Brahmani-Baitarani Estuary, Odisha	2014	2007-2010	2016		2018	2013	--	--
	9	Narmada-Tapti Estuary: Gujarat	2016	2012-2014	2018		2020	2014		

Kind of ecosystem	Sl. No.	Name of the ecosystem	Surveys conducted		Studies conducted		Publications brought out		Comments of ZSI (October and November 2024)	Audit Comments
			Target	Actual	Target	Actual	Target	Actual		
Freshwater Ecosystem	10	Sasthamkotta: Kerala	2013	2016-2019	2015	Not furnished	2017	2023	Published Dummy copy of the book is presently ready.	Published and printed in 2023.
	11	Deeper Beel: Kamrup, Assam	2013	2008-2011	2015		2017	2013	--	--
	12	Ashtamudi: Kerala	2016	Not Available	2018		2020	--	Not submitted by the authors in the Publication Division for printing process.	-
	13	Sultanpur Wetland	2016	2012-2014	2018		2020	2017	-	
	14	Kanjali: Punjab	2016	Not Available	2018		2020	-	Not submitted by the authors in the Publication Division for the printing process.	ZSI could not provide the period of the survey conducted.

Summary statistics

a. Out of the 14 ecosystems targeted, the survey of only 11 ecosystems was conducted: Sl. No. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13
b. In three ecosystems, survey publication was pending as the authors did not submit the manuscript in the publication division for printing: Sl. No. 1, 12 and 14
c. Delays in conducting surveys in four ecosystems: Sl. No. 2, 6, 7 and 10
d. Delays in conducting publication in three ecosystems: Sl. No. 2, 6 and 10

Annexure 21
(Refer Para 5.1.2.1(a))
Action taken by the Ministry on Protected Areas

Sl. No.	Name of protected areas	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
		Target	Actual		
1.	Hemis National Park, Jammu and Kashmir	2010	Not published	Proposed to be published by March 2018.	Not submitted by the authors to the Publication Division for printing process.
2.	Thettekad Bird Sanctuary, Kerala	2010	Not published		Published in 2022.
3.	Itanagar Wild Life Sanctuary	2010	Not published	Survey and studies were conducted for with experts available in ZSI. Rest of the faunal groups for which surveys and studies are being undertaken and document will be published by March 2019.	Not submitted by the authors to the Publication Division for printing process.
4.	Hazaribagh National Park, Jharkhand	2010	Not published	Proposed to be published by March 2018.	Not submitted by the authors to the Publication Division for printing process.
5.	Tale Valley Wild Life Sanctuary, Arunachal Pradesh	2008	Not published		Published and printed in 2024
6.	Lawalang Wild Life Sanctuary, Jharkhand	2009	Not published	Proposed to be published by March 2018.	Manuscript submitted on 22 May 2023 and Proposed to be printed in 2025.
7.	Palamau National Park, Jharkhand	2010	Not published	Surveys and studies are being undertaken for the Palamau National Park by GPRC of ZSI, Patna and document will be published by March 2019.	Not submitted by the authors to the Publication Division for printing process.
8.	Mahuadaur Wild Life Sanctuary, Jharkhand	2010	Not published	Surveys and studies are being undertaken for the Mahuadaur Wild Life Sanctuary, Jharkhand by GPRC of ZSI, Patna and document will be published by March 2019.	
9.	Dehang-Debang, Arunachal Pradesh	2013	Not published	Surveys and studies is being undertaken for the Dehang-Debang, Arunachal Pradesh by APRC ZSI, Itanagar and ZSI HQ, Kolkata and document will be published by March 2019.	Published and printed in 2024.
10.	Mahao Forest Reserve, Arunachal Pradesh	2011	Not published	Survey and studies are being undertaken for the Mahao Forest Reserve, Arunachal Pradesh by the APRC of ZSI, Itanagar and ZSI, HQ, Kolkata and document will be published by March 2019.	Manuscript submitted on 15 July 2019 and it is proposed to be printed in 2025.

Sl. No.	Name of protected areas	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
		Target	Actual		
11.	Saddle Peak National Park, Andaman and Nicobar Islands	2011	Not published	The survey and studies on the fauna of Saddle Peak, A&N Islands is completed and document being compiled and will be published by March 2019.	Diversity of Scleractinian Corals in the Adjoining Sea of Saddle Peak National Park, Andaman and Nicobar Islands has been published.
12.	Nongkhyliem Wild Life Sanctuary, Meghalaya	2011	Not published	The survey and studies on the fauna of Nongkhyliem Wildlife Sanctuary, Meghalaya is completed and document being complied and will be published by March 2019.	Published and printed in 2024.
13.	Siju Wild Life Sanctuary, Meghalaya	2011	Not published	Due to non-availability of experts and disturbances, the taxonomic studies on faunal groups could not able to be initiated.	Not submitted by the authors in the Publication Division for printing process..
14.	Valley of Flowers National Park, Uttarakhand	2011	Not available	The survey and studies on the fauna of Valley of Flower National Park, Uttarakhand are being undertaken by the NRC of ZSI, Dehradun and the document will be published by March 2019.	Published and printed in 2024.
15.	Indravati National Park, Chattisgarh	2012	Not published	Due to non-availability of experts and disturbances, the taxonomic studies on faunal groups could not able to be initiated.	Not submitted by the authors to the Publication Division for printing process.
16.	Gautam Buddha Wild Life Sanctuary, Bihar	2013	Not published	Survey and studies are being undertaken for the Gautam Buddha Wildlife Sanctuary by the GPRC of ZSI, Patna and document will be published by March 2019.	Manuscript submitted on 31 August 2023 for publication and proposed to be printed in 2025..
17.	Sonanadi Wild Life Sanctuary, Uttar Pradesh	2014	Not published	The survey and studies on the fauna of Sonanadi Wildlife Sanctuary, Uttar Pradesh are completed and document being compiled and will be published by March 2018.	Manuscript submitted on 23 November 2017 and proposed to be printed in 2025.
18.	East Or Inglis Island National Park, Andaman and Nicobar Islands	2014	Not published	The survey and studies on the fauna of East Or Inglis Island National Park, Andaman and Nicobar Islands, is completed and document is under review and will be published by March 2018.	Not submitted by the authors to the Publication Division for printing process.
19.	Mahatma Gandhi Marine National Park, Andaman and Nicobar Islands	2014	Not published	The survey and studies on the fauna of Mahatma Gandhi Marine National Park Andaman and Nicobar Islands is completed and document is under review and will be published by March 2018.	Information not furnished
20.	Aerial Island Andaman and Nicobar Islands	2014	Not published	The survey and studies on the fauna of Arial Island Andaman and Nicobar Islands is completed and document is under review and will be published by March 2018.	

Sl. No.	Name of protected areas	As per Audit Report No. 27 of 2014		Action taken by the Ministry (August 2016)	Action taken by ZSI (October and November 2024)
		Target	Actual		
21.	Pakhuli Forest Reserve, Arunachal Pradesh	2014	Not published	The survey and studies on the fauna of Pakhuli Forest Reserve, Arunachal Pradesh is completed and document published under faunal Diversity of Tiger Reserves in India.	Information not furnished
22.	Barnadi Wild Life Sanctuary, Assam	2014	Not published	Survey and studies are being undertaken for the Barnadi Wildlife Sanctuary, Assam by the NERC, ZSI, Shillong and document will be published by March 2019.	
23.	Dudhwa National Park, Uttar Pradesh	2014	Not published	The survey and studies on the fauna of Dudhwa National Park are completed and document has been published as State Fauna Series- Fauna of Uttar Pradesh.	The survey and studies on the fauna of Dudhwa National Park were completed and document was published in 2015 as State Fauna Series – Fauna of Uttar Pradesh.
24.	Kanha National Park, Madhya Pradesh	2015	Not due	The survey and studies on the fauna of Kanha Tiger Reserve is completed and document was published under Fauna of Conservation Area Series in 1995.	Proposed to be printed in 2024.
25.	Jaisamand Wild Life Sanctuary, Rajasthan	2015		Surveys and studies are being undertaken for the Jaisamand Wildlife Sanctuary, Rajasthan by the DRC of ZSI, Jodhpur and document will be published by March 2020.	Manuscript submitted for publication.
26.	Sandspur Wild Life Sanctuary, Uttar Pradesh	2016		Survey and studies are being undertaken for the Sandspur Wildlife Sanctuary, Uttar Pradesh by the NRC of ZSI, Dehradun and document will be published by March 2020.	Proposed to be printed in 2024.
27.	Dalma Wild Life Sanctuary, Jharkhand	2016		The survey and studies on the fauna of Dalma Wildlife Sanctuary, Jharkhand is completed and document is under review and will be published by March 2017.	Published in 2021.
28.	Rajgir Wild Life Sanctuary, Bihar	2016		Surveys and studies are being undertaken for the Rajgir Wildlife Sanctuary, Bihar by the GPRC of ZSI, Patna and document will be published by March 2020.	Information not furnished

Summary statistic

a. In five Protected Areas, the information was not furnished: Sl.No. 19, 20, 21, 22 and 28.
b. Publication of research has been brought out for eight Protected Areas: Sl No. 2, 5, 9, 11, 12, 14, 23 and 27.
c. Publication is pending for 15 Protected Areas: Sl.No. 1, 3, 4, 6 to 8, 10, 13, 15 to 18, 24, 25 and 26.
d. In eight cases, manuscripts were not submitted: Sl.No. 1,3,4,7,8,13,15 and 18

Annexure 22

(Refer Para 5.1.2.1(a))

Targets and achievements of Zoological Survey of India in surveys, studies conducted and publications brought out in Protected Areas

Sl. No.	Name of the Protected Areas	Survey conducted		Studies conducted		Publications brought out		Comments of ZSI (October 2024)	Audit Comments
		Target	Actual	Target	Actual	Target	Actual		
1	Gir N.P., Gujarat	2013	2024-2027	2015	Not furnished	2017	--	ZSI has taken up the PAs as Annual Programme of Research	taken up as Annual Programme of Research after a delay of 11 years of its schedule survey.
2	Valavadar N.P., Gujarat	2013	No	2015		2017	-	-	ZSI did not provide present status.
3	Great Nicobar B.R.: A&N	2014	2015-2018	2016		2018	2017	--	
4	Campbell Bay N.P.: A&N	2014	2008-2013	2016		2018	2015	--	
5	Galathea Bay N.P.: A&N	2014	2015-2018	2016		2018		--	
6	Koyna WLS, Maharashtra	2013	2015-2018	2015		2017	2021	--	
7	Radhanagari WLS, Maharashtra	2013	2007-2010	2015		2017	2014	--	
8	Eagles Nest WLS: Arunachal Pradesh	2013	2008-2011	2015		2017	Not furnished	Will be surveyed in a phased manner with due approval of RAMC	ZSI did not provide present status.
9	Bamboo Is. WLS: A&N	2013	No	2015		2017	--		
10	Barren IS. WLS: A&N	2013	No	2015		2017			
11	Narcondam Is. WLS: A&N	2013	No	2015		2017			
12	Great Himalayan N.P., H. P	2013	2012-2015	2015		2018	Published	--	The year of publication was not provided.
13	Garampani WLS, Assam	2013	No	2015		2017	--	Will be surveyed in a phased manner with due approval of RAMC	ZSI did not provide the present status.
14	Pabha WLS, Assam	2013	No	2015		2017			
15	Vedanthangat WLS, Tamil Nadu	2013	No	2015		2017			
16	Satpur N.P., M.P	2013	No	2015		2017			
17	Mount Abu WLS, Rajasthan	2013	2022-2025 (ongoing)	2015		2017	Ongoing	--	
18	Sitamata WLS, Rajasthan	2014	2009-2012	2016		2018	2014	Will be surveyed in a phased manner with the due approval of RAMC	
19	Kalesar WLS, Haryana	2014	2006-2010	2016		2018	2013		
20	Sohagbarua WLS, Uttar Pradesh	2014	No	2016		2018	--		
21	Topchanchi WLS, Jharkhand	2015	No	2017		2019			
22	Nagidam WLS, Bihar	2015	No	2017		2019			

Sl. No.	Name of the Protected Areas	Survey conducted		Studies conducted		Publications brought out		Comments of ZSI (October 2024)	Audit Comments
		Target	Actual	Target	Actual	Target	Actual		
23	Periyar, Kerala	2016	2014-2017	2018	Not furnished	2020	Not published	-	
24	Mahavir Swamy WLS, U.P.	2015	No	2017		2019	--	Will be surveyed in a phased manner with the due approval of RAMC	
25	Bori WLS, M.P.	2015	2023-26	2017		2019	--	Bori WLS, MP has been included in the approved research programme of 2023-24	ZSI did not intimate whether the survey had been conducted or not.
26	Kane WLS, Arunachal Pradesh	2016	No	2018		2020	--	Will be surveyed in a phased manner with due approval of RAMC	ZSI did not provide present status.
27	Valsada N.P., Valsad	2016	2020-23	2018		2020		Covered under the annual programme 'Assessment of faunal diversity of some selected Wildlife Sanctuaries of Gujarat (2020-23)	
28	Ratanmahal WLS, Panchmahal	2016	2020-23	2018		2020			
29	Kumbhalgarh WLS, Udaipur	2016	2006-2009	2018		2020	2013	Will be surveyed in a phased manner with due approval of RAMC	ZSI did not provide present status.
30	Pulicat WLS, Chingleput	2016	2005-2008	2018		2020	Not furnished		-
31	Chandoli WLS, Maharashtra	2016	2007-2010	2018		2020	2014		
32	South Sentinel Sanctuary, A&N	2016	No	2018		2020	--	No comments offered by ZSI.	
33	North Reef Is., A&N	2016	2014-2017	2018		2020	2020	--	
34	Laokhawa WLS, Assam	2016	No	2018		2020	--	Will be surveyed in a phased manner with the due approval of RAMC.	
35	Orang WLS, Assam	2016	2016-2018	2018		2020	Not furnished	-	

Sl. No.	Name of the Protected Areas	Survey conducted		Studies conducted		Publications brought out		Comments of ZSI (October 2024)	Audit Comments
		Target	Actual	Target	Actual	Target	Actual		
36	Ker Gharial WLS, Madhya Pradesh	2016	No	2018	Not furnished	2020	--	Will be surveyed in a phased manner with the due approval of RAMC.	
37	Tansa WLS, Maharashtra	2017	No	2019		2020			
38	Kamlang WLS, Arunachal Pradesh	2017	No	2019		2020			
39	Koderma WLS, Jharkhand	2017	2014-2017	2019		2020	Not published	-	
40	Parasnath WLS, Jharkhand	2017	No	2019		2020	--	Will be surveyed in a phased manner with the due approval of RAMC.	
41	Nauradehi WLS, Madhya Pradesh	2017	2013-2017	2019		2020	2022		

Summary statistics

a. Surveys have been completed for 19 Protected Areas: Sl No. 3, 4, 5, 6, 7, 8, 12, 18, 19, 23, 27, 28, 29, 30, 31, 33, 35, 39 and 41
b. The survey was ongoing as of October 2024: Sl No. 17
c. Survey in two Protected Areas has been taken up through Annual Programme of Research: Sl.No.1 and 25
d. In 19 Protected Areas, the survey status was not furnished: Sl.No.2, 9, 10, 11, 13, 14, 15, 16, 20, 21, 22, 24, 26, 32, 34, 36, 37, 38 and 40
e. Publication of research output has been completed for 12 Protected Areas: Sl No. 3, 4, 5, 6, 7, 12, 18, 19, 29, 31, 33 and 41
f. There is a delay in conducting surveys in nine Protected Areas: Sl.No.3, 5, 6, 12, 23, 27, 28, 33 and 35
g. There is a delay in bringing out publication in two Protected Areas: Sl. No. 6 and 41
h. In five Protected Areas, the publication status was not furnished: Sl. No. 8, 23, 30, 35 and 39.

Annexure 23
(Refer Para 5.1.2.1(b))
Delay in sending the Manuscript to the Referee

Sl. No.	Sl. No. of Pending List	Name of the research programme	Date of submission of manuscript	Date of sending manuscript to Referee	Delay in sending manuscript to Referee (months)
1.	1	Vertebrate faunal diversity with special reference to Avian and Mammalian fauna of the Sardar Samand Reservoir, Rajasthan	1.11.2011	19.7.2012	8
2.	17	Fauna of Northern Western Ghats	6.5.2017	12.12.2017	6
3.	18	Revision of Indian Cyprinid Genus Barilius Hamilton, 1822.	25.4.2017	4.12.2017	7
4.	19	Diversity And Distribution Status of Non Marine Molluscs of South Western Ghas Nilgiri- Anamalai- Palani Hills	25.4.2017	4.12.2017	7
5.	20	Catalogue of Type Collections of Ciliates: Phylum Ciliophora	31.3.2017	4.12.2017	8
6.	25	Fauna of Ropar Wetland	11.5.2020	16.12.2020	6
7.	26	Fauna of Sonanadi Wildlife Sanctuary	11.5.2020	16.12.2020	6
8.	28	Fauna of Samaspur Bird Sanctuary, Uttar Pradesh	11.5.2020	16.12.2020	6
9.	29	Fauna of Valley of Flowers	11.5.2020	16.12.2020	6
10.	40	Status Survey of Blue Sheep Pseudois nayaur in North West Trans- Himalaya, India	10.10.2018	17.5.2019	6
11.	52	Taxonomic studies on freshwater fishes of North Bengal	15.4.2019	13.1.2020	8
12.	61	Faunal Resources of Sainj Wildlife Sanctuary, District Kullu (Himachal Pradesh)	28.5.2020	16.12.2020	6
13.	62	Faunal Resources of Sangla Valley, District Kinnaur (Himachal Pradesh)	31.1.2020	15.12.2020	10
14.	63	Fauna of Bird Sanctuaries of Uttar Pradesh	11.5.2020	15.12.2020	7
15.	68	Faunal Diversity in Rice Agro-ecosystems of Kerala	19.11.2020	16.8.2021	8
16.	72	Cercarial Fauna of India	6.4.2021	19.12.2022	20
17.	73	Faunal Diversity of Chilka	19.4.2021	15.3.2022	10
18.	74	Fauna of West Coast of India with special reference to Maharashtra and Gujarat Marine Molluscs	19.4.2021	19.12.2022	20
19.	75	Taxonomic studies of Hillstream fishes of Meghalaya	21.4.2021	15.3.2022	10

Sl. No.	Sl. No. of Pending List	Name of the research programme	Date of submission of manuscript	Date of sending manuscript to Referee	Delay in sending manuscript to Referee (months)
20.	77	Field guide of freshwater turtles and tortoises of North Western India with DNA barcodes and their distribution	8.4.2021	15.3.2022	11
21.	78	Fauna of Pune District	8.6.2021	15.3.2022	9
22.	81	Faunal diversity of Dihang-Dibang Biosphere Reserve, Arunachal Pradesh	5.8.2021	15.3.2022	7
23.	85	Faunal Diversity of Panna Tiger Reserve, Madhya Pradesh	28.2.2022	4.5.2023	14
24.	86	Fauna of Neora Valley National Park	26.4.2022	4.5.2023	12
25.	88	Studies on Forest Insect Diversity of North-West Himalaya	11.3.2022	4.5.2023	13
26.	89	Status Survey of Endangered Hispid Hare Caprolagus hispidus using Camera Traps in India	26.4.2022	4.5.2023	12
27.	91	Fauna of Buxa Tiger Reserve, West Bengal	29.4.2022	4.5.2023	12
28.	92	Current Status of Faunal Diversity of Rushikulya Estuary, Odisha	5.5.2022	16.5.2023	12
29.	93	Fauna of Mahananda Wildlife Sanctuary	22.7.2022	16.5.2023	9
30.	94	Fishes of Deccan Peninsular India	16.9.2022	16.5.2023	8
31.	95	Fauna of Singalila National Park	7.10.2022	16.5.2023	7
32.	96	Fishes of the Siang River, Brahmaputra drainage, Arunachal Pradesh, North East India	7.11.2022	16.5.2023	6
33.	97	Faunal Inventory of Murlen National Park, Mizoram	27.10.2022	29.5.2023	7
34.	98	Faunal Inventorisation of Bunning and Zeilad Wild Life Sanctuaries, Manipur	7.11.2022	29.5.2023	6
35.	99	Seaweed and Seagrass associated Marine Faunal Diversity along the East coast of India	31.10.2022	29.5.2023	7
36.	100	Insect Pollinators of West Bengal	4.11.2022	29.5.2023	7
37.	101	Taxonomic studies of small mammals (Scandentia, Rodentia, Eulipotyphla and Chiroptera) of Southern Western Ghats	21.10.2022	29.5.2023	7
38.	102	Taxonomic studies on the Amphibians of the Western Ghats	27.10.2022	6.6.2023	7
39.	103	Faunal Diversity of Sanjay, Panna and Fossil National Park, Madhya Pradesh	28.10.2022	6.6.2023	7

Sl. No.	Sl. No. of Pending List	Name of the research programme	Date of submission of manuscript	Date of sending manuscript to Referee	Delay in sending manuscript to Referee (months)
40.	104	Faunal inventorisation of land snails of Arunachal Pradesh, India	21.10.2022	7.6.2023	7
41.	105	Studies on the aquatic and semi aquatic Hemiptera of important floodplain wetlands in the Central Valley of Manipur, North-East, India.	28.10.2022	7.6.2023	7
42.	106	Faunal Diversity of Gahirmatha Marine Sanctuary, Odisha	2.11.2022	7.6.2023	7
43.	107	Fauna of India: Family Vespidae (Insecta: Hymenoptera)	19.10.2022	15.6.2023	7
44.	108	Faunal Diversity of Purna Wildlife Sanctuary, Gujarat	21.10.2022	19.6.2023	7
45.	109	Morphology and Molecular Taxonomic studies of Marine Sponges of Lakshadweep	30.6.2022	19.6.2023	11
46.	111	Taxonomy and ecology of heterobranch slugs (Mollusca, Gastropoda, Heterobranchia) slugs of India	31.10.2022	19.7.2023	8

Annexure 24
(Refer Para 5.1.2.1(b))
Delay in sending reminder to Referee

Sl. No.	Sl. No. of Pending List	Name of the research programme	Submission of manuscript	Sent to Referee	Reminder sent to Referee	Time taken to send reminder to Referee (months)
1	3	Systematic and Diversity of Telenominal Hymenoptera: platygastridae) of South Western Ghats, India	13.1.2014	20.2.2014	17.12.2014	9
2	4	Scelioninae (Hymenoptera: Platygastridae) of South Western Ghats- A Systematic inventory	31.3.2015	3.6.2015	23.8.2017	25
3	10	Exploration of Vertebrate \ Diversity of Chambal River in Rajasthan State	28.10.2016	13.2.2017	10.9.2017 (1st)	7
					28.12.2017 (2nd)	
					06.3.2019 (3rd)	14
4	12	Field Guide Fresh Water Turtles and Tortoises of North Western India	14.1.2017	4.4.2017	02.11.2017	7
5	14	Exploration of Ichthyofaunal Diversity in the Escape Reservoirs of Indira Gandhi Nahar Pariyojana (IGNP) Canal in the Bikaner and Jaisalmer Districts of the Thar Desert, Rajasthan	3.2.2017	4.4.2017	14.9.2018	17
6	15	A Catalogue of Termites (Order: Blattaria; Infraorder: Isoptera) of India	3.3.2017	4.4.2017	14.9.2018 (1st)	17
					2.12.2022 (2nd)	50
7	18	Revision of Indian Cyprinid Genus Barilius Hamilton, 1822.	25.4.2017	04.12.2017	6.3.2019 (1st)	15
					2.12.2022 (2nd)	31

Sl. No.	Sl. No. of Pending List	Name of the research programme	Submission of manuscript	Sent to Referee	Reminder sent to Referee	Time taken to send reminder to Referee (months)
8	38	Status, Distribution, Population, Dynamics and Habitat Selection of Small Mammals in Andaman Island	11.10.2018	13.12.2018	12.12.2022	48
9	51	Fauna of Tropical Rain Forests Western Ghats Kerala	23.10.2020	16.12.2020	17.8.2021 (1st)	8
					14.12.2022 (2nd)	16
10	57	Exploration of lchthyofaunal Diversity in Some Selected Tributaries of Chambal Riverine System, Rajasthan, India	25.10.2019	19.2.2020	14.12.2022	34
11	78	Fauna of Pune District	8.6.2021	15.3.2022	16.12.2022	9

Annexure 25
(Refer Para 5.1.2.1(b))
Delay in sending reminder to Author

Sl. No.	Sl. No. of Pending List	Name of the research programme	Referee's comments Sent to Author for revision	Reminder sent to Author	Delay in sending reminder to Author (months)
1	1	Vertebrate faunal diversity with special reference to Avian and Mammalian fauna of the Sardar Samand Reservoir, Rajasthan	26.7.2012	29.11.2013	16
2	2	A Pictorial guide to the genera of Diapriinae (Diapriidae: Diaprioidea) of India	16.5.2016	23.8.2017	15
				13.10.2017	17
				10.9.2018	10
3	3	Systematic and Diversity of Telenominal Hymenoptera: platygastridae) of South Western Ghats, India	10.5.2016	23.8.2017	15
				13.10.2017	17
				14.9.2018	28
				6.3.2019	34
				2.12.2022	44
4	4	Scelioninae (Hymenoptera: Platygastridae) of South Western Ghats- A Systematic inventory	21.5.2019	2.12.2022	42
5	9	Faunal Diversity of Sariska Tiger Reserve, Rajasthan	21.12.2017	6.9.2018	8
				16.12.2022	50
6	12	Field Guide Fresh Water Turtles and Tortoises of North West India	8.11.2017	10.9.2018	9
7	19	Diversity And Distribution Status of Non Marine Molluscs of South Western Ghats Nilgiri- Anamalai-Palani Hills	6.2.2018	06.3.2019	12
				18.8.2022	41
8	20	Catalogue of Type Collections of Ciliates: Phylum Ciliophora	8.8.2018	18.8.2022	48
9	32	Diversity and Zoogeographical Distribution of Freshwater Fishes of Kameng River, Arunachal Pradesh	22.7.2019	8.12.2022	40
10	35	Fauna of Bomadi Wildlife Sanctuary, Assam	4.2.2019 (comments of EB)	8.12.2022	45
11	42	Mollusca and Zooplankton of temporary and permanent water bodies in and around Valmiki Tiger Reserve, Saraiyaman Lake, Kusheshwar Asthan Lake and Gogabil Pakshi Vihar (lBA-Sites) in Bihar (2012-2014)	1.7.2019	14.12.2022	40
12	48	Status Survey of Swamp Deer or Barasingha, Rucervus duvaucelii (G. Cuvier, 1823) (Cervidae: Cetartiodactyla: Mammalia) in India	16.7.2020	14.12.2022	28
13	52	Taxonomic studies on freshwater fishes of North Bengal	13.8.2020	14.12.2022	28

Sl. No.	Sl. No. of Pending List	Name of the research programme	Referee's comments Sent to Author for revision	Reminder sent to Author	Delay in sending reminder to Author (months)
14	59	Fauna of Terai Ecosystem	19.2.2020 (as per EB decision, Ms. sent to author to revise)	14.12.2022	33
15	69	Final Project Report: Resurvey of Siju Cave, South Garo Hills, Meghalaya	16.8.2021	14.12.2022	15
16	79	Fauna of Jharkhand	15.3.2022 (to make changes as suggested by EB)	16.12.2022	9

Annexure 26
(Refer Para 5.1.2.2)
Non-prevention of Invasive fauna

Sl. No.	Species Name	Common Name	Native Range	Year of identification by ZSI	Pathway of intrusion of the fauna
1.	*Cryptotermes dudleyi* Banks, 1918	West Indian Dry Wood Termite	Southeast Asia	Not furnished	Not furnished
2.	*Cryptotermes gestroi* (Wasmann, 1896)	The Asian subterranean termite	Southeast Asia		
3.	*Frankliniella occidentalis* (Pergande 1895)	Western Flower Thrips	Western North America	2015	
4.	*Thrips parvispinus* (Karny, 1922)	-	California	2015	
5.	*Aleurodius disperses* Russel, 1965	The Spiralling Whitefly	Central America and the Caribbean region	1995	
6.	*Leurodicus rugioperculatus* Martin, 2004	Rugose Spiralling Whitefly	Belize, Guatemala and the swamps of Florida in the southern United States	2016	
7.	*Eriosoma lanigerum* (Hausmann, 1802)	Woolly Apple Aphid	North America	1889	
8.	*Wahlgreniella nervata* (Gillette, 1908)	Strawberry Tree Aphid	North America	2014	
9.	*Heteropsylla cubana* Crawford, 1914	Subabul Psyllid	North America	1988	
10.	*Icerya purchasi* (Maskell, 1878)	Cottony Cushion Scale	Australia	1921	
11.	*Orthezia insignis* Browne, 1887	Lantana Bug	Mexico	1915	
12.	*Paracopccus* marginatus Williams and Granara de Willink, 1992	Papaya Mealy Bug	Mexico and Central America	2012	
13.	*Phenacoccus parvus* Morrison, 1924	Lantana Mealybug	--	2012	
14.	*Phenacoccus solenopsis* Tinsley 1898	Cotton Mealybug	North America	1999	
15.	*Phenacoccus madeirensis* Green 1923	Maderia Mealybug	Central America	2012	
16.	*Pseudococcus jackbeardleysi* Gimpel and Miller, 1996	Jack Beardsley Mealybug	Mexico South to Brazil	2012	
17.	*Pineus pini* (Macquart, 1819)	Woolly pine aphid	Western and Central Europe	Not furnished	
18.	*Quadraspidiotus perniciousus* Comstock, 1881	San Jose Scale	China	1911	

Sl. No.	Species Name	Common Name	Native Range	Year of identification by ZSI	Pathway of intrusion of the fauna
19.	*Leptocybe invasa* Fisher and La Salle, 2004	Blue Gum Chalcid/ Eu8calyptus All Aasp	Queensland, Australia	2001	Not furnished
20.	*Quadrastichus erythrinae* Kim, 2004	Erythrina Gall Wasp	Africa	2005	
21.	*Monomorium pharaonis* (Linnaeus, 1758)	Pharaoh Ant	Africa	Not furnished	
22.	*Xyleborus volvulus* (Fabricius, 1775)	Ambrosia Beetle	-		
23.	*Hypothenemus hampei* (Ferrari, 1867)	Coffee berry borer	Central Africa	1990	
24.	*Spodoptera litura* (Fabricius, 1775)	Ladde Purugu (Telgu)	-	Not furnished	
25.	*Phthorimaea operculella* (Zeller, 1873)	Potato tuber Moth	South America	1937	
26.	*Tuta absoluta* (Meyrick, 1917)	Tomato Pinworm. South American. Tomato leaf miner	South America	2014	
27.	*Plutella xylostella* (Linnaeus, 1758)	Diamond-Back Moth	Mediterranean region	1941	
28.	*Aedes aegypti* (Linnaeus, 1762)	Yellow Fever Mosquito	Africa	Not furnished	
29.	*Culex quinquefasciatus* Say, 1823	Southern House Mosquito	West Africa		
30.	*Bactrocera dorsalis* (Hendel, 1912)	Oriental Fruit Fly	Asia		
31.	*Liriomyza trifolli* (Burgess, 1880)	Serpentine Leaf Miner	Florida and Carribean	1992	
32.	*Lissachatina fulica*, (Bowdich 1822)	Giant African snail	Africa	1847	
33.	*Deroceras leave* (O.F. Muller, 1774)	Slug	Northern Asia and Europe	2004	
34.	*Semiperula sp.*	Snail	--	2012	
35.	*Carassius auratus* (Linnaeus 1758)	Gold Crucian Carp	Central Asia: China, Japan, Ha	Not furnished	
36.	*Cyprinus carpio* Linnaeus, 1758	Common Carp	Temperate portions of Europe and Asia	1939	
37.	*Ctenopharyngodon idella* (Valenciennes, 1844)	Grass Carp	Rivers that feed into the Pacific Ocean in eastern Russia	1957	
38.	*Hypophthalmichthys molitrix* (Valenciennes, 1844)	Silver Carp	China and eastern Siberia	1959	

Sl. No.	Species Name	Common Name	Native Range	Year of identification by ZSI	Pathway of intrusion of the fauna
39.	*Hypophthalmichthys nobilis* (Richardson 1845)	Bighead Carp	Asia, Eastern China	1987	Not furnished
40.	*Tinca tinca* (Linnaeus 1758)	Green Tench	Europe and Asia	1870	
41.	*Piaractus brachypomus* (Cuvier, 1818)	Red Bellied Pacu	Amazon and Orinoco River basin	Between 2003 and 2004	
42.	*Clarias gariepinus* (Burchell, 1822)	African Sharp tooth Catfish	Africa	1980	
43.	*Pangasianodon hypophthalmus* (Sauvage, 1878)	Suchi Pangas Catfish	Mekong River in Vietnam	1994-95	
44.	*Pterygoplichthys disjunctivus* (Weber 1991)	Vermiculated Sailfin catfish	--	Not furnished	
45.	*Pterygoplichthys multiradiatus* (Hancock 1828)	Sailfin catfish	--		
46.	*Pterygoplichthys pardalis* (Castelnau 1855)	Amazon Sailfin catfish	--		
47.	*Gambusia affinis* (Baird and Girard 1853)	Mosquito fish	Eastern and Southern United States	1928	
48.	*Gambusia holbrooki* Girard 1859	Mosquito fish	Southern United States	1928	
49.	*Oncorhynchus mykiss* (Walbaum 1792)	Rainbow Trout	Western North America, from Alaska to the Baja Peninsula	1868	
50.	*Salmo trutta* Linnaeus, 1758	Brown Trout	Europe	1868 and 1900	
51.	*Salvelinus fontinalis* (Mitchill 1814)	American Brook Charr	Eastern North America in the United States and Canada	1911	
52.	*Oreochromis mossambica* (Peters, 1852)	Mossambique	Southern Africa	1952	
53.	*Oreochromis niloticus* (Linnaeus, 1758)	Nile Tilapia	Africa	1990	
54.	*Trachemys scripta* (Thunberg In Schoepff, 1792)	Red-eared slider	Latin America	2007	
55.	*Columba livia Gmelin, 1789*	Pigeon	Europe	Not furnished	
56.	*Sturnus vulgaris* Linnaeus, 1758	Starling	Europe, Southwest Asia and Northern Africa		

Sl. No.	Species Name	Common Name	Native Range	Year of identification by ZSI	Pathway of intrusion of the fauna
57.	*Zosterops japonicas* Temminck and Schlegel, 1845	Japanese white-eye	Pacific coast of East Asia	Not furnished	Not furnished
58.	*Equus asinus* Linnaeus, 1758	Donkey, African wild ass	Africa		
59.	*Rattus exulans* (Peale, 1848)	Pacific rat, Polynesian rat	Pacific basic		
60	*Carijoa riisei* (Duchassaing and Michelotti 1860)	Snowflake coral	Western Atlantic Ocean, South Carolina to Brazil	2013	
61	*Tubastrea coccinea* Lesson, 1829	Orange cup coral	Brazil, Caribbean Sea, Gulf of Guinea, Gulf of Mexico	2018	

Annexure 27
(Refer Para 5.1.2.3)
Mismatch of specimens sent by the Regional Centres and received by Headquarters

Sl No.	As per records of Regional Centres (RCs)			As per records of Headquarters	
	Name of concerned RC	**Specimens sent to HQ**	**Specimens identified by HQ (as per the identification report)**	**Specimens received HQ**	**Specimens identified by HQ**
1.	ANRC Port Blair	Formicidae-36 vials Ant-108 vials Hermiptera-13 vials Coleoptera-16 vials Thysonoptera- 12 vials (DNA Lab) Thysanura-1 vial (Aterygota) Trichoptera-3 vials (MIO) Diptera-20 vials Isoptera-65 vials Thysanoptera-2 vials Hymenotpera-2 vials Ephemeroptera-2 vials Spiders-1 vial Termites-64 tubes Isoptera-64 tubes Lepidoptera-125 packets Termite samples-490 samples **TOTAL:** **281 vials, 128 tubes, 490 samples, 125 packets**	Nil	Brachyuran Crab-44 exs **TOTAL: 44 exs**	Formicidar-258 exs Ant-258 exs Termites Data-64 tubes Isoptera-4 vials Spider-1 vial **TOTAL:** **64 tubes, 5 vials, 516 exs**

Sl No.	As per records of Regional Centres (RCs)			As per records of Headquarters	
	Name of concerned RC	**Specimens sent to HQ**	**Specimens identified by HQ (as per the identification report)**	**Specimens received HQ**	**Specimens identified by HQ**
2.	SRC Chennai	Hemiptera-3275 exs Coleoptera-7651 exs Hymenoptera-5160 exs Hemiptera: Heteroptera-3452 exs Homoptera-833 exs Earthworm-4 exs Insecta: Phasmida-73 exs Crustacea: Prawn-2629 exs Diptera-5002 exs Lepidoptera-403 exs Orthoptera-800 exs Arachnida-173 exs Crustacea: Crab-06 exs Crustacea: Prawn-132 exs Orthoptera (Gryllidae)-79 exs Hemipteran-1021 exs **TOTAL: 30693 exs**	Nil	Lepidoptera-403 exs Coleoptera-2236 exs Diptera-914 ex Thysanoptera-42 exs Hymenoptera-289 exs Bees 114-exs Ants 578-exs Hemiptera-737 exs Orthoptera-449 exs Araneae-173 exs Coleoptera-4 Termite samples-490 samples Hymenoptera (ant)-2 pkts Hemiptera-91 pkts Ant-1 pkt Lepidoptera-125 pkts Isoptera-1 vial MIO-1 vial Hemiptera-13 vials Coleoptera 9-vials Thysanoptera-12 vials (DNA lab) Thysanura-1 vial (Apterygota) Trichoptera (MIO)-3 vials Diptera 20-vials Isoptera 4-vials Thysanoptera-2 vials lsoptera 61-vials Coleoptera-7 vials Hymenoptera-2 vials Ephemeroptera-2 vials Spider-1 vial Termites Data-64 tubes Spider-283 exs **TOTAL: 6222 exs, 490 samples, 219 packets, 139 vials, 64 tubes**	Deptera-1 ex **TOTAL: 1 ex**

Sl No.	As per records of Regional Centres (RCs)			As per records of Headquarters	
	Name of concerned RC	**Specimens sent to HQ**	**Specimens identified by HQ (as per the identification report)**	**Specimens received HQ**	**Specimens identified by HQ**
3.	FBRC Hyderabad	Hymenoptera (ants)-3828 exs Isoptera-858 exs Neuroptera-14 exs Orthoptera-866 exs Dermaptera-124 exs Hemiptera-1508 exs Lepidoptera-388 exs Phasmida-77 exs Diptera-1183 exs Thysanoptera-41 exs Coleoptera-4522 exs Acari-50 exs Aquatic Hemiptera-33 exs Aquatic Celeoptera-86 exs Phasmidae-68 exs Hymenoptera (Bees)-168 Hymenoptera (Anmomaloninae)-3 Thysanura-26 exs Hymenoptera-16 Reptiles-3 exs Isopoda-105 exs Annelida-87 exs Millepede-383 exs Protozoa (Moss)-11 exs Protozoa (Mud)-8 exs Scorpion- 42 exs Acari-26 exs Platyhelminthes-1 exs Araneae-972 exs Prawns-213 exs Protozoans-7 exs Scorpions-12 exs Theryphonida-12 exs Soil Nematodes-7 exs Reptilia-191 exs **TOTAL: 15939 exs**	Hymenoptera (ants)-3828 exs Isoptera-858 exs Neuroptera-14 exs Orthoptera-866 exs Dermaptera-124 exs Hemiptera-1508 exs Lepidoptera-388 exs Phasmida-77 exs Diptera-1183 exs Thysanoptera-41 exs Coleoptera-4522 exs Acari-50 exs Aquatic Hemiptera-33 exs Aquatic Celeoptera-86 exs Phasmidae-68 exs Hymenoptera (Bees)-168 Hymenoptera (Anmomaloninae)-3 Thysanura-26 exs Hymenoptera-16 Reptiles-3 exs Isopoda-105 exs Annelida-87 exs Millepede-383 exs Protozoa (Moss)-11 exs Protozoa (Mud)-8 exs Scorpion- 42 exs Acari-26 exs Platyhelminthes-1 exs Araneae-972 exs Prawns-213 exs Protozoans-7 exs Scorpions-12 exs Theryphonida-12 exs Soil Nematodes-7 exs Reptilia-191 exs **TOTAL: 15939 exs**	Hymenoptera (ants)-2402 exs Isoptera-858 exs Neuroptera-14 exs Orthoptera-866 exs Dermaptera-124 exs Hemiptera-1508 exs Lepidoptera-388 exs Phasmida-77 exs Diptera-1183 exs Thysanoptera-41 exs Coleoptera-4792 exs Acari-54 exs Aquatic Hemiptera-33 exs Aquatic Celeoptera-86 exs Hymenoptera-1442 exs Phasmidae-68 exs Hymenoptera (Bees)-168 exs Hymenoptera (Anmomaloninae)-3 exs Thysanura-26 exs Reptiles-3 exs Isopoda-30 exs Annelida-87 exs Isopod-75 exs Millepede-383 exs Protozoa (Moss)-11 exs Protozoa (Mud)-8 exs Scorpion- 42 exs Acari-22 exs Platyhelminthes-1 exs Araneae-972 exs Prawns-213 exs Protozoans-7 exs Scorpions-12 exs Theryphonida-12 exs Soil Nematodes-7 exs Reptilia-191 exs Ants-3 eppendorfs Termites-4 vials Leech-1 tube **TOTAL: 16209 exs, 4 vials, 3 eppendorfs, 1 tube**	Isoptera-858 exs Lepidoptera-388 exs Hemiptera-51 exs **TOTAL: 1297 exs**

Sl No.	As per records of Regional Centres (RCs)			As per records of Headquarters	
	Name of concerned RC	**Specimens sent to HQ**	**Specimens identified by HQ (as per the identification report)**	**Specimens received HQ**	**Specimens identified by HQ**
4.	DRC Jodhpur	Coleoptera-9037 exs Diptera-2192 exs Dermaptera-331 exs Neuroptera-297 exs Diatyaptera-24 exs Thysanoptera-13 exs Trichoptera-428 exs Hemiptera-1837 exs Hymenoptera-1345 exs Orthoptera-1327 exs Odonata-253 exs Lepidoptera-1248 exs Isoptera-413 exs Arachnida-11 exs Mantodea-72 exs Mecaptera-12 exs Phasmatodea-10 exs Ephemeroptera-3 exs Thysanura-44 exs Embioptera-16 exs Chilopoda-56 exs Scorpiones-55 exs Blatodea-20 exs Crustacea-73 exs Gastropoda-31 exs Mollusca-314 exs Mariopoda-25 exs **TOTAL: 19487 exs**	Isoptera-180 exs Hemiptera-610 exs Neuroptera-20 exs Trichoptera-8 exs Thysanura-5 exs Hymenoptera-99 exs Coleoptera-5 exs **TOTAL: 927 exs**	Crustacea-73 exs Gastropoda-31 exs Mollusca-314 exs Chilopoda-56 exs Myriapoda-25 exs Orthoptera-1295 exs Hymenoptera-1239 exs Hemiptera-1315 exs Isoptera-413 exs Arachnida-11 exs Coleoptera-5273 exs Diptera-1630 exs Neuroptera-184 exs Mantodea-72 exs Mecaptera-12 exs Dermaptera-282 exs Odonata-248 exs Lepidoptera-987 exs Scorpiones-55 exs Trichoptera-425 exs Thysanura-44 exs Blattodea-20 exs Embioptera-16 exs Ephemenoptera-3 exs Phasmatodea-10 exs **TOTAL: 14033 exs**	Diptera-418 exs Thysanoptera-13 exs Hemiptera-1603 exs Odonata-93 exs Isoptera-180 exs Neuroptera-18 exs Trichoptera-14 exs Hymenoptera-274 exs Lepidoptera-835 exs **TOTAL: 3448 exs**
5.	NERC Shillong	Aquatic Hemiptera-260 exs Termites (Isoptera)-73 exs Ants (Formicidae)-114 exs **TOTAL: 447 exs**	Nil	Nil	Termites-4 exs **TOTAL-4 exs**

Annexure 28
(Refer Para 5.1.2.4)
Review of the status of threatened and endemic species

Sl. No.	Name of the endangered species	As per Audit Report No. 27 of 2014				Action taken by Ministry (April 2016)	Action taken by ZSI (October 2024)
		Scheduled date for duration of survey	Scheduled date for completion of study	Scheduled date for publication	Audit observation		
1.	Snow leopard	2003-06	2008	2010	Survey not initiated	Status survey not undertaken due to lack of expertise.	Published in 2022
2.	Black necked Crane	2003-06	2008	2010		Survey conducted during 2015 to 2018	Published in 2021
3.	Coral Reef (Nicobar Island)	2003-06	2008	2010	Survey undertaken during 2006-09. Publication not brought out.	--	Not submitted by the authors in the publication division for printing process.
4.	King Crab	2003-06	2008	2010	Survey not initiated.	Survey conducted during 2013 to 2016	Published in 2018
5.	Indian Wild Ass	2004-06	2008	2010		Survey conducted during 2015 to 2019	Not submitted by the authors in the publication division for printing process.
6.	Swamp Deer	2006-10	2012	2014	Survey undertaken during 2006-07. Publication not brought out.	--	Manuscript submitted on 12 April 2019. Processed for publication and scheduled to be printed in 2025.
7.	Hangul Kashmir Stag	2010-12	2014	2016	Survey not initiated.	Status survey not undertaken due to lack of expertise.	Published in 2021.
8.	Hoolock Gibbon	2004-06	2008	2010		Survey conducted during 2015 to 2018	Published in 2019
9.	Nicobar Megapode A&N Islands	2010-12	2014	2016		Survey conducted during 2015 to 2018	Published in 2023

Summary statistics

a. Publications were brought out in six cases: Sl. No. 1, 2, 4 and 7 to 9

b. No publication was done in three cases: Sl. No. 3, 5 and 6

Annexure 29
(Refer Para 5.1.2.4)
Status of publication of the status survey conducted by ZSI

Sl. No.	Name of the species	Period of Survey	Status Survey conducted by Headquarters/Regional Centre	Status of publication of Faunal Accounts
1.	Sacred groove Bush frog Raorchestes sanctisilvaticus (Das and Chanda, 1997)	04/2018 – 03/2021	Central Zone Regional Centre, Jabalpur	Published
2.	Gegeneophis danieli Giri, Wilkinson and Gower	04/2014 – 03/2018	Western Regional Centre, Pune	Not published
3.	Gegeneophis seshachari Ravichandran, Gower and Wilkinson		Western Regional Centre, Pune	
4.	Indotyphlus battersbyi Taylor		Western Regional Centre, Pune	
5.	Indotyphlus maharashtrensis		Western Regional Centre, Pune	
6.	small mammalian fauna (Chiroptera, Rodentia and Soricomorpha) of Manipur state, North eastern India	04/2019 – 03/2022	North Eastern Regional Centre, Shillong	Published
7.	Raorchestes shillongensis (Pillai and Chanda, 1973) (Amphibia: Anura: Rhacophoridae)	04/2018 – 03/2019		Not published.
8.	Nicobar Megapode in Great Nicobar Island	04/2015 – 03/2018	Andaman and Nicobar Regional Centre, Port Blair	
9.	Robber Crab Birgus latro in Nicobar Islands			
10.	Ardeotis nigriceps (Vigors, 1831) (Great Indian Bustard) in Grasslands of Rajasthan	04/2014 – 03/2017	Desert Regional Centre, Jodhpur	
11.	Indian Wild Ass (Equus hemionus khur Lesson, 1827) in Desert Ecosystem	04/2015 – 03/2019		
12.	Black necked crane Grus nigricollis in Ladakh	04/2015 – 03/2018	Northern Regional Centre, Dehradun	Published
13.	Blue sheep Pseudois nayaur in North West Trans Himalaya			Not furnished

Sl. No.	Name of the species	Period of Survey	Status Survey conducted by Headquarters/Regional Centre	Status of publication of Faunal Accounts
14.	Brown Bear in Western Himalayas	04/2017 – 03/2020	Headquarters, Kolkata	Published
15.	Golden Langur (Trachypithecus geei H. Khajuria) at Lower Assam	04/2012 – 03/2015		Not published
16.	Swamp Deer or Barasingha, Rucervus duvaucelii (G. Cuvier, 1823) (Cervidae: Cetartiodactyl: Mammalia)	04/2015 – 03/2018		Published
17.	Himalayan Musk Deer (Moschus chrysogaster (Hodgson, 1839) in Himachal Pradesh	04/2014 – 03/2016		Not published
18.	Hispid Hare using Camera traps	04/2017 – 03/2021		Not published
19.	Giant Squirrel (Ratufa indica) of Satkosia TR, Odisha	04/2016 – 03/2018		Not furnished
20.	Hoolock Gibbon in Assam	04/2015 – 03/2016		Published
21.	Hangul in Jammu and Kasmir	04/2017 – 03/2018		Not published
22.	Crab-eating Macaque Macca fascicularis umbrosa (Miller, 1902) at Andaman and Nicobar Islands	04/2013 – 03/2016		Published
23.	Indian Grey Wolf Canis lupus pallipes Sykes, 1831 in West Bengal and some parts of Jharkhand adjacent to WB	04/2015 – 03/2017		
24.	Indian Golden Gecko, Calodactylodes aureus (Beddome, 1870) in Eastern Ghats	04/2011 – 03/2014		Not furnished
25.	Horseshoe Crab	03/2013 – 06/2016		Published

Summary statistics:

a. Publications were brought out in nine cases: Sl. No. 1, 6, 12, 14, 16, 20, 22, 23 and 25
b. No publication was done in 13 cases: Sl. No. 2, 3, 4, 5, 7, 8, 9, 10, 11, 15, 17, 18 and 21
c. In three cases, no data was furnished by the Zoological Survey of India. Sl. No. 13, 19 and 24

Annexure 30

(Refer Para 5.1.3.1)

Unauthentic specimen holding of National Zoological Collection: Difference in figures of unnamed specimens of Regional Centres furnished during the present Audit and earlier Compliance Audit.

1. EBRC Gopalpur-on-sea

Particulars	Opening balance of Unnamed Specimens at the beginning of 2015-16	Total collection of Specimens during 2015-16 to 2019-20	Total identification of Specimens during 2015-16 to 2019-20	Closing balance of Unnamed Specimens at the end of 2019-20
As per **reply dated October 2022** furnished by ZSI, HQ, Kolkata	30,749	14,292	11,512	33,529
As per **reply dated July 2021** furnished by EBRC, Gopalpur-On-Sea	10,919	13,954	16,370	8,523
Difference	**19,830**	**338**	**4,858**	**25,006**

2. SRC Canning

Particulars	Opening balance of Unnamed Specimens at the beginning of 2013-14	Total collection of Specimens during 2013-14 to 2021-22	Total identification of Specimens during 2013-14 to 2021-22	Closing balance of Unnamed Specimens at the end of 2021-22
As per **reply dated October 2022** furnished by ZSI, HQ, Kolkata	29,594	19,244	17,706	27,373
As per **reply dated May 2023** furnished by SRC, Canning	43,449	9,399	15,717	30,546
Difference	**13,855**	**9,845**	**1,989**	**3,173**

3. HQ Kolkata

Particulars	Opening balance of Unnamed Specimens at the beginning of 2022-23	Total collection of Specimens during 2022-23	Total identification of Specimens during 2022-23	Closing balance of Unnamed Specimens at the end of 2022-23
As per **reply dated July 2023** furnished by ZSI, HQ, Kolkata	5,90,632	71,096	1,50,115	5,43,793
As per **reply dated March 2023** furnished by ZSI, HQ, Kolkata	3,58,020	69,004	63,777	3,63,247
Difference	**2,32,612**	**2,092**	**86,338**	**1,80,546**

Annexure 31

(Refer Para 5.1.3.1)

Unauthentic specimen holding of National Zoological Collection: Difference in figures of unnamed specimens of FBRC-Hyderabad, WRC-Pune, DRC-Jodhpur and CZRC-Jabalpur

Name of the Regional Centre	Opening balance of Unnamed Specimens at the beginning of 2018-19			Closing balance of Unnamed Specimens at the end of 2021-22		
	As per reply furnished by ZSI, HQ, Kolkata	As per reply furnished by the Centre	Difference	As per reply furnished by ZSI, HQ, Kolkata	As per reply furnished by the Centre	Difference
FBRC, Hyderabad	11,159	25,588	55,547	14,861	55,547	40,686
WRC, Pune	86,469	93,659	94,339	87,149	94,339	7,190
DRC, Jodhpur	4,02,529	3,98,036	3,74,459	4,26,196	3,74,459	51,737
CZRC, Jabalpur	67,677	62,280	68,736	74,026	68,736	5,290

Annexure 32
(Refer Paras 7.3.1.3 and 7.3.2.1)
List of modules/sub-modules of IIS

Sl. No.	Module/Sub Module ID	Module/Sub Module Name
1.	1010	HR- Recruitment -> Manpower Planning (MPP)
2.	1011	HR- Recruitment -> Recruitment (RCT) – The system should have the capability to support online recruitment also
3.	1012	HR- Character and Antecedents Verification (CAV)
4.	1013	HR- Recruitment-> Recruitment (RCT)
5.	1014	HR- Recruitment -> promotion (PRO)
6.	1015	HR- Recruitment -> Transfer (TRA)
7.	1016	HR-Employee Master and Service Book (EMS)
8.	1020	HR- Establishment -> Annual Performance Assessment Report (APA)
9.	1021	HR- Establishment -> Pay Fixation (PAF)
10.	1022	HR- Establishment -> Performance Related Incentive Scheme (PRIS)
11.	1023	HR-Establishment-> Leave (LEV)
12.	1024	HR- Establishment -> Pension (PEN)
13.	1025	HR- Establishment -> House Building Advance (HBA)
14.	1026	HR- Establishment -> Medical claim (MED)
15.	1027	HR- Establishment -> Leave Travel concession (LTC)
16.	1028	HR- Establishment -> Tours (TOR)
17.	1029	HR- Establishment ->CPF/GPF Advance (CGA)
18.	1030	HR- Establishment -> Loans and Advances (LON)
19.	1031	HR- Establishment -> Children Education Assistance (CEA)
20.	1050	Industrial Relation-> Immovable Property Return (IPR)
21.	1052	HR- Industrial Relation -> Disciplinary Cases (DIA)
22.	1053	HR- Industrial Relation -> Residential (Government Accommodation) Allotment System – Applicable for Heavy Water Plants (QAR)
23.	1060	HR- General Administration -> Air Travel (AIR)
24.	1061	HR- General Administration -> Vehicle Request and Gate Pass (VGP)
25.	1062	HR- General Administration -> Reimbursement (REM)
26.	1063	HR- General Administration -> Tracking of Paper Consumption (PCO)
27.	1064	HR- General Administration -> Liveries, Furniture and Fixtures (LFF)
28.	1065	HR- General Administration -> Dispatch (DIS)
29.	1070	HR- Hindi Section related reports (HIN)
30.	1080	HR- Library (LIB)
31.	1081	HR- Training (TRG)
32.	1082	HR- Qualification and Authorisation (QIS)
33.	1084	HR- Time Attendance System (TAS)
34.	1086	HR- Tracking of Identity Card (IDC)
35.	1090	HR- Payroll (PPI)
36.	1091	HR- Visa/Passport Approval
37.	2010	FA – Tender Processing (TPS)
38.	2020	FA – Payment by Cheque/Cash (PCC)
39.	2022	FA – Loans and Advances (LOA)
40.	2024	FA – Temporary Advance (TAD)

Sl. No.	Module/Sub Module ID	Module/Sub Module Name
41.	2026	FA – Leave Travel concession (LTC)
42.	2027	FA – Works and Contract Payment (WCP)
43.	2029	FA – RCF, KRIBHCentral Office and TDP Payment (RKT)
44.	2031	FA – Contingency Payment (CPA)
45.	2033	FA – Pension (PEN)
46.	2035	FA – GPF/CPF Sanction (GCS)
47.	2037	FA – Compilation (COM)
48.	2039	FA – Other Accounting/Auditing Requirements (AAR)
49.	2043	FA – Ledger/Broadsheets maintained by Accounts (LBA)
50.	9010	Project Monitoring and Reporting
51.	30	Plant Status Reporting (PSR)
52.	40	Maintenance management (MM)
53	60	Stores and inventory (SI)
54.	70	Purchase – Purchase Indents Management and Follow-up System (PIM)
55.	80	Safety Event Reporting (SER)

Annexure 33
(Refer Para 7.3.2.1)
List of modules/sub-modules not reviewed/approved by the competent authority

Sl. No.	Name of the modules/sub-modules	Functionality of the system covered by that User Requirement Specification
User Requirement Specifications were not reviewed and approved.		
1.	1021 HR - (PAF)	Establishment -> Pay Fixation
2.	1024 HR - (PEN)	Establishment -> Pension
3.	1029 HR - (CGA)	Establishment>CPF/GPF Advance
4.	2026 FA - (LTC)	Leave Travel Concession
5.	2035 FA - (GCS)	GPF/CPF Sanction
6.	1090 HR - (PPI)	Payroll
User Requirement Specifications were approved but not reviewed.		
7.	1010 HR- (MPP)	Recruitment -> Manpower Planning
8.	1011 HR - (RCT)	-> Recruitment
9.	1012 HR- (CAV)	Character and Antecedents Verification
10.	1013 HR- (APT)	Recruitment-> Appointment
11.	1014 HR- (PRO)	Recruitment -> promotion
12.	1015 HR- (TRA)	Recruitment -> Transfer
13.	1016 HR- (EMS)	Employee Master and Service Book
14.	1020 HR- (APA)	Establishment -> Annual Performance Assessment Report
15.	1022 HR- (PRIS)	Establishment -> Performance Related Incentive scheme
16.	1023 HR- (LEV)	Establishment-> Leave
17.	1025 HR- (HBA)	Establishment -> House Building Advance
18.	1026 HR- (MED)	Establishment -> Medical claim
19.	1028 HR- (TOR)	Establishment -> Tours
20.	1030 HR- (LOA)	Establishment -> Loans and Advances
21.	1031 HR- (CEA)	Establishment -> Children…Single Sign On admin functions. Education Assistance
22.	1050 (IPR)	Industrial Relation-> Immovable Property Return
23.	1052 HR- (DIA)	Industrial Relation -> Disciplinary Cases
24.	1053 HR- – (QAR)	Industrial Relation -> Residential (Government Accommodation) Allotment System
25.	1060 HR- (AIR)	General Administration -> Air Travel
26.	1061 HR- (VGP)	General Administration -> Vehicle Request and Gate Pass
27.	1062 HR- (REM)	General Administration -> Reimbursement
28.	1063 HR- (PCO)	General Administration -> Tracking of Paper Consumption
29.	1064 HR- (LFF)	General Administration -> Liveries, Furniture and Fixtures
30.	1065 HR- (DIS)	General Administration -> Dispatch
31.	1070 HR- (HIN)	Hindi Section related reports
32.	1081 HR- (TRG)	Training
33.	1084 HR- (TAS)	Time Attendance System
34.	1086 HR- (IDC)	Tracking of Identity Card
35.	1091 HR- Visa/	Passport Approval

Sl. No.	Name of the modules/sub-modules	Functionality of the system covered by that User Requirement Specification
36.	2010 FA – (TPS)	Tender Processing
37.	2020 FA – (PCC)	Payment by Cheque/Cash
38.	2022 FA – (LOA)	Loans and Advances
39.	2024 FA – (TAD)	Temporary Advance
40.	2027 FA – (WCP)	Works and Contract Payment
41.	2029 FA –(RKT)	RCF, KRIBH Central Office and TDP Payment
42.	2031 FA – (CPA)	Contingency Payment
43.	2033 FA – (PEN)	Pension
44.	2039 FA –(AAR)	Other Accounting/Auditing Requirements
45.	2043 FA – (LBA)	Ledger/Broadsheets maintained by Accounts
User-Requirement Specifications were reviewed as well as approved		
1.	1080-LIB	HR- Library (LIB)
2.	1082 QIS	HR- Qualification and Authorisation (QIS)
3.	9010 PMS	Project Monitoring and Reporting
4.	30 PSR	Plant Status Reporting
5.	40 MM	Maintenance and Management Module
6.	60 SI	Stores Inventory
7.	70 PM	Purchase Module
8.	80 - SER	Safety Event Reporting

Annexure 34
(Refer Para 7.3.3.4)
Business processes not implemented in sub-module Promotion

1014	HR-Recruitment -> Promotion (PRO)
101405	Deferred Case-Scientific
101406	Sub-Committee Minutes Report-Scientific
101407	Report –Letter to BARC with Promotion Cases- Scientific
101408	Report- Letter to DAE for Approval of Promotion- Scientific
101409	Report – Letter to DAE for creation of Posts – Scientific
101413	Deferred Case- Technical
101414	Report –Screening Committee Minutes – Technical
101415	Report – Letter to conduct Trade Test – Technical
101416	Written Examination/DPC Panel Details – Administrative – Departmental
101417	Promotion Detail – Proposal – Administrative – Departmental
101418	Promotion Detail – Result – Administrative – Departmental
101419	Report on Written Examination Details
101420	Promotion -> Administrative -> Seniority Number Change
101421	Promotion -> Administrative -> Seniority cum Fitness -> DPC Panel Details
101422	Promotion -> Administrative -> Seniority cum Fitness -> Promotion Detail
101423	Promotion -> Administrative -> Seniority cum Fitness -> Report -> Seniority List
101426	ACP Scheme -> Results
101427	Promotion -> Administrative -> Assured Career Progression (ACP) -> Reports -> ACP Eligible List
101428	ACP Screening Committee Report
101429	ACP Memorandum Report
101431	Promotion -> *Ad hoc* Promotion -> Entry, Recommend Forward, Approval
101433	Report -> Pending/Disciplinary Case/Outside Employment
101434	Report -> Letter for calling promotion proposal
101435	Report -> Promotion Proposal
101436	Report -> Notification of Screening Committee Meeting
101437	Report -> Interview Result/Request for Creation of Post
101438	Report -> Letter to sites regarding results
101439	Report -> Office Memorandum
101440	Report -> Gazette Notification
101441	Report -> Endorsement to individual
101442	Report -> List of Deferred Cases
101444	Report -> Anticipated Vacancy
1015	HR- Recruitment -> Transfer (TRA)

Annexure 35
(Refer Para 7.3.3.4)
Reasons for the non-implementation of 13 sub-modules under Finance and Accounts

Sl. No.	Name of the sub-modules under FA	Reason for non-implementation
1.	FA – Tender Processing (TPS)	Tender processing will be done by the user.
2.	FA – Payment by Cheque/Cash (PCC)	Due to the implementation of PFMS, the sub-module is not being utilised.
3.	FA – RCF, KRIBH Central Office and TDP Payment (RKT)	Due to the implementation of PFMS, the sub-module is not being utilised.
4.	FA – Loans and Advances (LOA)	Inputs from users are required to be received, for processing the same through these sub-modules.
5.	FA – Temporary Advance (TAD)	
6.	FA – Leave Travel concession (LTC)	
7.	FA – Works and Contract Payment (WCP)	
8.	FA – Contingency Payment (CPA)	
9.	FA – Pension (PEN)	
10.	FA – GPF/CPF Sanction (GCS)	
11.	FA – Compilation (COM)	Due to the implementation of PFMS, the sub-module is not being utilised.
12.	FA – Other Accounting/Auditing Requirements (AAR)	Data entries are yet to be processed under this sub-module.
13.	FA – Ledger/Broadsheets maintained by Accounts (LBA)	HWB stated (April 2024) that action had been initiated for the improvement of this sub-module.

Annexure 36
(Refer Para 7.4.4.1)
Details of the time overrun and cost overrun of project

Lists of completed projects with time overrun										
Sr. No.	**Name of the Project**	**Date of Sanction**	**Sanctioned Cost *(₹ in crore)***	**Revised Cost (if any)**	**Cost overrun (if any)**	**Scheduled date of completion**	**Actual date of completion**	**Actual expenditure as of August 2024**	**Present Status as of August 2024**	**Time overrun (months) as of August 2024**
1	'Department of Atomic Energy Medical Cyclotron Project at Kolkata'	31.1.2004	19.23	25.15	5.13	31.12.2006	31.12.2023	24.36	Closed	204
2	Advanced Facility for Radiopharmaceuticals Production	6.12.2012	41.5	--	--	31.3.2017	31.3.2021	41.22	Closed	48
3	Technology Development for Advanced Radiation Equipment	31.3.2013	80	99		31.12.2017	31.12.2020	17.35	Closed	36
Projects not completed even after expiry of the scheduled date of completion as on 31/03/2024										
4	Setting up of Medical Use Fission based Mo-99 production facility[#]	22.9.2010	128	314.20	186.20	31.1.2014 (R- Dec 2024)	--	279	ongoing	127
5	Indigenous High Dose Rate Brachytherapy Equipment*	6.12.2007	8.00	9.60	1.60	31.1.2013	--	--	ongoing	--

Lists of ongoing projects whose scheduled date of completion was after March 2024							
Sr. No.	**Name of the Project**	**Date of Sanction**	**Sanctioned Cost** ***(₹ in crore)***	**Scheduled date of completion**	**Actual expenditure as of August 2024**	**Status as of August 2024**	**Time overrun (months) as of August 2024**
6	Augmentation and Revamping of Product and Services Facilities	26.4.2021	65	25.4.2024 (R-31.3.2026)	22.65	ongoing	4
7	Safety System Upgradation of Isotope Medical Division[$]	31.5.2021	11.34	31.5.2024 (R-31.3.2025)	7.26	ongoing	3
8	Modernisation and Augmentation of Radiopharmaceuticals Production Facilities (MARPF)	8.7.2021	64	31.7.2026	16.39	ongoing	--
9	Expansion of Rajasthan Atomic Power Project Cobalt Facility	23.7.2021	85	22.7.2026	5.3	ongoing	--
10	Equipment Development Project	2.11.2021	24	1.11.2025	9.05	ongoing	--

**** Audit observations on one project 'Indigenous High Dose Rate Brachytherapy Equipment' have already been printed in the CAG Audit Report no 24 of 2023, hence, excluded from current audit.***

 # This project had been completed on 30.9.2024.

$ This project had been completed on 31.3.2025.

Annexure 37
Refer Para 7.4.4.1(d)
Meeting conducted against the approved periodicity

Committees	Yearly Periodicity stipulated	Total 2018-24	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	Total
			Meeting conducted						
Board of Radiation and Isotope Technology Board	4	24	2	2	2	2	3	3	14
Local Safety Committee for Rajasthan Atomic Power Project Cobalt Facility	4	24	2	2	1	2	1	3	11
Local Safety Committee for Isotope Medical Division	4	24	3	3	1	0	1	0	8
Local Safety Committee for Radiation Processing Plant	4	24	4	4	1	1	4	4	18
Local Safety Committee for RC Delhi	4	24	3	2	1	1	3	4	14
Board of Radiation and Isotope Technology Industrial Safety Committee	4	24	2	4	1	1	3	4	15
LSC for Medical Cyclotron Facility, Radiation Medicine Centre	4	24	5	2	1	1	2	4	15
Board of Radiation and Isotope Technology Performance Review Committee (PRC)	4	13	-	-	1	2	3	0	6
Regional Council Meeting	2	12	2	2	0	2	0	2	8

*LSC- Local Safety Committee

Annexure 38
(Refer Para 7.4.4.2)
Details of supply

Name of the product	Quantity demanded received	Quantity supplied by the Board of Radiation and Isotope Technology	Date of demand received from customer	Date on which products were supplied	Days taken for supply
Special Illuminator-5	33,347	6,500	19.2.2020	24.5.2021	460
Special Illuminator-8	1,026	100	3.10.2018	29.5.2021	969
Special Illuminator-15	2,052	200	3.10.2018	29.5.2021	969
Special Illuminator-15A	1,026	100	3.10.2018	29.5.2021	969
Special Illuminator-101	253	253	19.1.2021	12.6.2021	144
Special Illuminator-7	250	250	30.6.2021	1.10.2021	93
Special Illuminator-8	850	400	30.6.2021	8.10.2021	100
Special Illuminator-15	1,700	900	30.6.2021	8.10.2021	100
Special Illuminator-15A	850	450	30.6.2021	8.10.2021	100
Special Illuminator-26	500	500	30.6.2021	8.10.2021	100
Special Illuminator-6	250	250	30.6.2021	16.10.2021	108
Special Illuminator-11	250	250	30.6.2021	16.10.2021	108
Special Illuminator-12	250	150	30.6.2021	16.10.2021	108
Special Illuminator-8	850	400	30.6.2021	1.1.2022	185
Special Illuminator-12	250	100	30.6.2021	1.1.2022	185
Special Illuminator-13	250	230	30.6.2021	1.1.2022	185
Special Illuminator-15	1,700	800	30.6.2021	1.1.2022	185
Special Illuminator-15A	850	400	30.6.2021	1.1.2022	185
Special Illuminator-17	125	125	30.6.2021	1.1.2022	185
Special Illuminator-27	250	250	30.6.2021	1.1.2022	185
Special Illuminator-7	12,000	12,000	30.12.2021	21.1.2022	22
Special Illuminator-26	250	250	21.10.2020	10.6.2022	597

Name of the product	Quantity demanded received	Quantity supplied by the Board of Radiation and Isotope Technology	Date of demand received from customer	Date on which products were supplied	Days taken for supply
Special Illuminator-26	491	222	27.5.2022	28.7.2022	62
Special Illuminator-27	5	5	27.5.2022	28.7.2022	62
Special Illuminator-11	8	6	27.5.2022	28.7.2022	62
Special Illuminator-17	127	8	27.5.2022	28.7.2022	62
Special Illuminator-13	5	5	27.5.2022	28.7.2022	62
Special Illuminator-7	5	5	27.5.2022	28.7.2022	62
Special Illuminator-26	491	271	27.5.2022	30.9.2022	126
Special Illuminator-27	1	1	27.5.2022	30.9.2022	126
Special Illuminator-11	8	2	27.5.2022	30.9.2022	126
Special Illuminator-17	127	119	27.5.2022	30.9.2022	126
Special Illuminator-5	33,347	6,847	19.2.2020	24.2.2023	1,101
Special Illuminator-5	33,726	33,726	2020[94]	24.2.2023	-
Special Illuminator-18	10	10	10.2.2023	28.2.2023	18
Total	**1,27,480**	**66,085**			

(66085/127480) *100= 51.84 per cent

94 ***Date and month not provided*** by BRIT.

Annexure 39

(Refer Para 7.4.4.3)

Details of differential amount between imported cost and indigenous production cost

Year	Purchase Order No.	Imported quantity Ci	Imported cost *(₹)*	Indigenous production cost per Ci *(₹)*	Quantity	Indigenous production cost *(₹)*	Differential Amount *(₹)*
2015-16	17755/FE dt. 17.2.2016	500	3,94,74,917	42,583	500	2,12,91,500	1,81,83,417
2017-18	18191/FE dt. 5.7.2017	500	4,25,02,042	42,583	500	2,12,91,500	2,12,10,542
2018-19	18525/FE dt. 29.8.2018	250	1,99,84,041	42,583	250	1,06,45,750	93,38,291
2018-19	18623/FE dt. 13.3.2019	250	2,39,81,087	42,583	250	1,06,45,750	1,33,35,337
2020-21	18852 dt. 24.4.2020	280	2,94,05,600	42,583	280	1,19,23,240	1,74,82,360
2020-21	18900 dt. 5.1.2021	130	1,86,38,100	42,583	130	55,35,790	1,31,02,310
2020-21	18925 dt. 22.3.2021	370	5,21,73,700	42,583	370	1,57,55,710	3,64,17,990
2021-22	19017 dt. 18.2.2022	60	91,68,600	42,583	60	25,54,980	66,13,620
2021-22	16477 dt. 17.3.2022	440	6,72,36,400	42,583	440	1,87,36,520	4,84,99,880
2022-23	19017	60	91,68,600	42,583	60	25,54,980	66,13,620
2022-23	16477	440	6,72,00,000	42,583	440	1,87,36,520	4,84,63,480
2023-24	19152	250	2,36,00,000	42,583	250	1,06,45,750	1,29,54,250
Total			**40,25,33,087**			**15,03,17,990**	**25,22,15,097**

Annexure 40
(Refer Para 7.4.5.1)
Details of pending dues

Financial year	No. of cases		Amount due *(₹)*	
	Government Organisations	Private Organisations	Government Organisations	Private Organisations
	(i)	(ii)	(iii)	(iv)
Prior to 2013	67	95	2,31,48,679	1,37,54,164
2013-14	45	27	73,52,297	12,25,548
2014-15	39	31	60,09,296	13,94,876
2015-16	44	20	99,55,123	8,81,224
2016-17	54	33	4,54,82,457	7,34,296
2017-18	58	47	11,79,03,882	38,69,948
2018-19	65	80	12,26,85,459	40,49,239
2019-20	102	192	14,06,65,411	2,77,57,847
2020-21	65	146	7,77,37,977	3,18,44,207
2021-22	64	291	14,89,10,448	7,07,35,659
2022-23	89	350	19,48,25,490	11,45,49,530
2023-24	90	441	22,17,55,920	14,37,13,132
2024-25	72	412	10,64,58,662	1,90,17,597
TOTAL	**854**	**2,165**	**1,22,28,91,101**	**52,35,27,267**
GRAND TOTAL(i+ii)	**3019**		**1,74,64,18,368**	
		Unidentified customers	**(-) 22,16,95,381**	
		Net outstanding dues	**1,52,47,22,987**	

Annexure 41
(Refer Para 7.4.5.2)
Details of payment

Name of payment	Period of payment	Amount *(₹ in crore)*
Excise Duties	(i) May 2012 to 18.01.2017	32.1719
Penalty	(ii) If the notice pays the determined amount within 30 days of receipt of order, then the penalty imposed on them shall be reduced to 25 *per cent*	8.0430
Interest	(a) 2012-13 to 31 March 2018	17.9192
	(b) 1.4.2018 to 2.5.2018 (at the rate of ₹1,32,214 per day) x 32 days	0.4231
	(iii) Interest Total (a +b)	18.3423
	Total Excise Duty Liability (i+ii+iii)	**58.5572**