सत्यमेव जयते

Report of the Comptroller and Auditor General of India for the year ended March 2022

SUPREME AUDIT INSTITUTION OF INDIA

लोकहितार्थ सत्यनिष्ठा

Dedicated to Truth in Public Interest

Union Government (Commercial)
Report No.15 of 2023
Compliance Audit of Activities of Selected CPSEs

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CONTENTS

PREFACE

1. This Report of the Comptroller and Auditor General of India has been prepared for submission to the Government under the provisions of Section 19-A of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act,1971, as amended in 1984.

2. This Audit Report contains the audit findings arising out of compliance audit of the selected areas of operation relating to Airports Authority of India under the administrative control of Ministry of Civil Aviation, Government of India, NEPA Limited under the administrative control of Ministry of Heavy Industries, Government of India and Bokaro Power Supply Company (Private) Limited under the administrative control of Ministry of Steel, Government of India.

3. This Audit Report includes the audit findings on the following three subjects:

- Setting-up of a greenfield airport in Pakyong, Sikkim
- Revival of NEPA Limited through Revival and Mill Development Plan
- Operational Performance of Bokaro Power Supply Company (Private) Limited

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

Executive Summary

EXECUTIVE SUMMARY

I Introduction

This Audit Report contains audit findings arising out of compliance audit of selected areas of operation relating to Airports Authority of India under the administrative control of Ministry of Civil Aviation, Government of India, NEPA Limited under the administrative control of Ministry of Heavy Industries, Government of India and Bokaro Power Supply Company (Private) Limited under the administrative control of Ministry of Steel, Government of India. These areas were selected in Audit for review on the basis of their relative importance. This Audit Report includes audit findings on the following three subjects:

1. Setting-up of a greenfield airport in Pakyong, Sikkim
2. Revival of NEPA Limited through Revival and Mill Development Plan
3. Operational Performance of Bokaro Power Supply Company (Private) Limited

II Highlights

Highlights of significant observations on the selected areas included in the Report are given below:

Setting-up of a greenfield airport in Pakyong, Sikkim

Airports Authority of India (Authority) considered (June 2001) Pakyong, a sub-divisional town of East Sikkim, as the site for setting up the first greenfield airport of Sikkim. Government of Sikkim entered into (March 2002) a Memorandum of Understanding with Airports Authority of India to construct the greenfield airport. The Project was approved by Government of India in October 2008 with scheduled completion in January 2012 and the approved cost was ₹309.46 crore. The project cost was to be borne by Government of India and Airports Authority of India in 9:1 ratio. The airport was ultimately declared ready for commercial operations by Airports Authority of India in May 2018. However, the commercial operations of flights were suspended from June 2019 to January 2021 and again from October 2022 till February 2023 due to poor visibility. Till March 2022, the cost of construction of the airport was ₹708.46 crore, out of which Government of India grant was ₹448.09 crore. In the meantime, Pakyong airport was included (September 2018) in the "*Ude Desh ka Aam Nagrik* (UDAN)" Regional Connectivity Scheme and the Authority received ₹164.38 crore as Regional Connectivity Scheme grant.

Construction and operation of greenfield airport at Pakyong was analysed in audit and major audit observations are as follows:

- Adoption of an improper slope-cutting design resulted in major cracks in houses leading to local agitation. This led to avoidable expenditure on account of payment of compensation to locals, stalling of the construction work and cost overrun as well as extra works to mitigate the problems occurring due to ground subsidence amounting to ₹314.53 crore.

(Paragraph 1.2.1.1)

Recommendation 1: Airports Authority of India needs to exercise proper diligence while implementing as well as making any subsequent modification to critical drawings/designs.

Recommendation 2: Adequate control measures including inter-alia financial controls may be exercised by Airports Authority of India while executing projects in order to avoid time and cost overrun.

- The Airports Authority of India did not comply with the Directorate General of Civil Aviation's directives to conduct an aeronautical study prior to construction of the Pakyong airport project, leading to issues with obstacles in the transitional surface that impacted flight operations.

(Paragraph 1.2.1.2)

Recommendation 3: Airports Authority of India may ensure that all the relevant studies as recommended by various regulatory bodies are conducted prior to commencement of Projects.

- Airports Authority of India had an agreement with M/s Punj Lloyd Ltd. for construction of the Pakyong airport but failed to make necessary deductions from earlier Running Account Bills. Recovery of ₹25.92 crore was due to be made from Punj Lloyd Ltd. However, the Company has become bankrupt and the chances of recovery appear to be remote.

(Paragraph 1.2.1.3)

Recommendation 4: Adequate internal controls should be put in place by Airports Authority of India while releasing the contractor's payments and responsibility should be fixed in case of any lapses.

- The meteorological data considered in Detailed Project Report pertained to Gangtok, which is approximately 33 kilometres away from Pakyong. Going for project based on meteorological data of Gangtok indicates that adequate emphasis was not given to meteorological data before planning of the Airport.

(Paragraph 1.2.2.1)

- Audit observed that the actual runway length of Pakyong airport was 560 metres less than the required length for Bombardier Q-400 aircraft which was being operated by M/s SpiceJet Ltd.

(Paragraph 1.2.2.2)

- Audit observed that the Runway End Safety Area available at Pakyong airport was only 70 metres and 90 metres at the northern and southern ends respectively, while the Detailed Project Report had envisaged a length of 150 metres at both ends.

(Paragraph 1.2.2.3)

Recommendation 5: Airports Authority of India may take suitable measures to address safety concern issues regarding deficiency in availability of adequate length of runway as well as Runway End Safety Area for flight operations with Bombardier Q-400 aircraft.

- The Doppler Very High Frequency Omni Range/Distance Measuring Equipment and Very High Frequency radio installed at Pakyong airport in February 2018 were found to be not functioning optimally due to surrounding hilly terrain during calibration in March 2018. The International Civil Aviation Organisation flagged this as a hazard in April 2019 and recommended the installation of repeaters to enhance the signals. However, as of April 2021, the Management had not installed repeaters to enable proper functioning of navigational aids.

(Paragraph 1.2.2.4)

- Audit observed that Directorate General of Civil Aviation provided inconsistent licences as it granted a "2C" aerodrome licence at Pakyong to the Airports Authority of India, while it provided a licence for the operation of a "3C" aircraft to SpiceJet, which is a higher category aircraft.

(Paragraph 1.2.2.5)

Recommendation 6: Airports Authority of India should ensure compliance to conditions/requirements of Directorate General of Civil Aviation/International Civil Aviation Organisation during the operations at Pakyong airport.

- Airports Authority of India failed to explore the best possible method to resolve visibility issues at Pakyong airport despite the fact that the same was made available by the International Civil Aviation Organisation (ICAO) vide its Performance Based Navigation Manual in 2008. The airport experienced cancellation of scheduled flights due to visibility issues since the commencement of commercial operations.

(Paragraph 1.2.2.6)

Recommendation 7: Directorate General of Civil Aviation/Airports Authority of India must ensure compliance with the category of licence issued for aerodrome/aircraft to ensure safety of flight operations. For Pakyong airport, responsibility needs to be fixed for permitting operation of aircrafts which were not compatible with infrastructure as well as aerodrome licence.

- Pakyong airport was included in UDAN Scheme in 2017, and M/s SpiceJet was selected as the exclusive operator for three years under the Scheme. However, Audit observed that SpiceJet only operated in four out of ten allotted UDAN routes. SpiceJet was required to submit certain returns to the Airports Authority of India. These returns were not provided to Audit by the Authority despite repeated requests. Hence, Audit could not get an assurance that the seats reserved under the Regional Connectivity Scheme were actually made available to the targeted passengers at the approved Regional Connectivity Scheme fare.

(Paragraph 1.2.2.7)

Revival of NEPA Limited through Revival and Mill Development Plan

The Government of India (GoI) took over the controlling interest in National Newsprint & Paper Mills Limited (Private Company) by acquiring 51 *per cent* shares of the Company in 1958. The name of the Company was changed to NEPA Limited in 1989. NEPA's core activity was manufacturing of Newsprint Paper.

NEPA Limited was making profit till 1991 i.e., before implementation of New Economic Policy. Though there was no ban on import pre-liberalisation, there was restriction/quota on import of paper with certain conditions. Post liberalisation, newsprint industry transformed from a completely protected environment where government exercised control on its production, distribution and pricing, to sudden exposure to international competition.

Cost of Newsprint Paper manufactured by NEPA Limited could not compete with the international rates. Further, quality of paper produced was much lower than the market requirements due to ageing equipment and non-availability of proper de-inking facilities. Hence, NEPA Limited started incurring losses and its net worth was completely eroded by 31 March 1997 and it was referred to Board of Industrial and Financial Reconstruction (BIFR) in 1998.

BRPSE recommended (September 2011) Revival package for NEPA Limited. Government of India approved (September 2012) Revival and Mill Development Plan at a cost of ₹285 crore which was approved by BIFR in March 2014. The cost of the revival package was revised (October 2021) to ₹512.41 crore.

Revival of NEPA Limited was aimed at operation of NEPA on a sustainable profit basis, to bring it out of the purview of BIFR and turn its net worth positive after revival. It was envisaged to strategically disinvest NEPA after its revival.

Revival and Mill Development Plan work was to be completed by December 2019 i.e., 12 months from the date of release of first installment of funds in December 2018. The work was completed at revised cost of ₹512.41 crore in August 2022 and NEPA Limited commenced production in September 2022.

Implementation of Revival and Mill Development Plan was analysed in Audit and the following significant reasons for delay and increased cost were observed:

- NEPA appointed Tata Consulting Engineers Limited as Project Management Consultant based on its own technical experience and that of its alliance partner A.F. Incepal, Spain. The alliance partner, however, discontinued to work with Tata Consulting Engineers after January 2016. This adversely affected the implementation of Revival and Mill Development Plan.

(Paragraph 2.2.1.1)

- Project Management Consultant did not prepare detailed and realistic estimates of works before issue of tender to evaluate the authenticity and appropriateness of rates quoted by the bidders in respect of work pertaining to refurbishment of 12.27 megawatts captive power plant, refurbishment of paper machines and procurement/supply and installation of De-inking plant through open tendering process. This resulted in substantial differences

between estimated value of ₹127.70 crore and awarded value of ₹213.46 crore, delay in evaluation of bids and frequent changes in scope of work leading to cascading delays and cost overrun.

(Paragraph 2.2.1.2)

- Clause for payment of escalation for services provided by Project Management Consultant after scheduled completion period of 24 months from the date of Letter of Intent was not mentioned in the contract signed between Project Management Consultant and NEPA Limited. The Company, without amending clause 3 of the work order, approved various contract amendments through which time extensions beyond the scheduled completion date were granted with increased cost.

(Paragraph 2.2.1.3)

- Ineffective monitoring of Revival and Mill Development Plan works on the part of Project Management Consultant and non-deployment of skilled work force by it resulted in delay in completion of the project due to which NEPA Limited was deprived from its envisaged benefits on time.

(Paragraph 2.2.1.4)

Recommendation 1: The Ministry may strengthen the mechanism for monitoring the activities of the Project Management Consultant and for due performance by him in future assignments.

- Contract value of civil and structural work for construction of 300 Bone Dry Tonne Per Day De-Inking Plant, Raw Material Storage building and modification works for both Paper Machines was increased by 97.60 *per cent* of total awarded cost which resulted in violation of contractual terms which permitted variation of only (+/-) 15 *per cent.*

(Paragraph 2.2.2.2)

- NEPA envisaged to construct an ash pond to dump ash generated during two years by Captive Power Plant on an area of nine acres which was subsequently reduced to 4.5 acres to accommodate ash generated during one year only considering financial constraints. This may cause overflow of ash after one year which would not only damage environment but may involve additional cost for construction of another ash pond.

(Paragraph 2.2.4)

- NEPA Limited extended undue favor to contractors viz. giving them various time extensions, allowing price escalation of ₹23.60 lakh and submission of security deposit beyond stipulated date.

(Paragraph 2.2.5)

Recommendation 2: The Company may develop a mechanism for enforcing procurement guidelines and contractual terms and conditions for effective works management.

- NEPA failed to fulfil the export obligation of ₹69.46 crore within the time prescribed under Export Promotion Capital Goods Scheme due to which it was required to pay custom duty of ₹11.57 crore (50 *per cent* of total duty saved) along with interest of ₹3.44 crore (at the applicable rate of 18 *per cent* per annum up to December 2021).

(Paragraph 2.3.1)

- Due to failure to make timely payments of electricity bills, NEPA had to pay delayed payment surcharge of ₹58.52 lakh. Further, NEPA did not seek relief available to a sick industrial company and consequently had to bear damages and interest amounting to ₹5.75 crore levied by Employees Provident Fund Organisation on account of default in deposit of Provident Fund contribution.

(Paragraphs 2.3.2 and 2.3.3)

Recommendation 3: Financial management may be strengthened so that statutory dues are paid on time to avoid punitive action.

- The Department of Heavy Industry did not prescribe any formal monitoring and supervision mechanism to ensure timely completion of Revival and Mill Development Plan activities since its inception to September 2018. A Monitoring Committee was constituted (October 2018) to monitor the progress on monthly basis which held 23 meetings up to 25 November 2021 in which the focus was mainly on speeding up of tendering process and it did not make recommendations on sequencing of various activities to shorten the implementation process time.

(Paragraph 2.5.1)

- Management did not ensure retention of sufficient skilled manpower for effective and efficient implementation of Revival and Mill Development Plan while approving Voluntary Retirement Scheme for employees.

(Paragraph 2.5.2)

Recommendation 4: The Ministry may ensure that proper monitoring mechanism exists for all major projects. Voluntary Retirement Scheme may be implemented after assessing the manpower required for completion of the project(s).

Operational Performance of Bokaro Power Supply Company (Private) Limited

Bokaro Power Supply Company (Private) Limited (BPSCL) was formed in September 2001 as a Joint venture of Steel Authority of India Limited (SAIL) and Damodar Valley Corporation (DVC) with 50:50 share capital to operate as a captive power plant to supply steam and power to SAIL/Bokaro Steel Plant. The Company had rated capacity for steam and power generation of 2,180 tonnes per hour and 338 Megawatt respectively.

Review of Operational performance of the Company in audit revealed the following:

- Annual planned production fixed by Bokaro Power Supply Company (both in respect of steam and power) was lower than the rated capacity of the plant and actual production was lower than Bokaro Steel Plant's planned intake (except power in 2020-21) from Bokaro Power Supply Company. Generation of power by Bokaro Power Supply Company was between 68 *per cent* and 97 *per cent* of the planned requirement of power by Bokaro Steel Plant during 2016-17 to 2019-20. The generation of power was, however 100 *per cent* of the planned requirement in 2020-21. Steam generation in comparison to requirement of Bokaro Steel Plant was between 81 *per cent* and 96 *per cent* during 2016-17 to 2020-21.

(Paragraph 3.3.1)

Recommendation 1: The Company may make efforts to ensure achievement of annual requirement of power for Bokaro Steel Plant and to manage the availability of its inputs to overcome shortages constraining production.

- Four boilers (Boilers 2 to 5) were operating lower than the rated capacity (around 60 *per cent*). Hourly rate of steam production in Boiler 9 commissioned in 2014 was only 75 *per cent* of the rated capacity which was lower than that of Boilers 6, 7 and 8 commissioned during 1980-1989.This was mainly due to forced shutdown on account of tripping of rotors, leakages in tube, tripping on Rotor Earth Fault etc., which were operational reasons and should have been controlled by the Management.

(Paragraph 3.3.2.1)

- Performance of turbo generators was between 26 *per cent* and 51 *per cent*. The performance of Turbo Generator 9 which was commissioned in 2014, was also low and ranged between 13.14 Megawatt and 16.09 Megawatt. The reasons for low performance were avoidable like tube leakage, power failure etc. These were mainly due to lack of overhauling/capital repairs on time.

(Paragraph 3.3.2.2)

- As boilers at Bokaro Power Supply Company had outlived their useful life of 30 years, Bokaro Power Supply Company fixed norm for overhauling of boilers within two to three years. Audit noted that out of 8 boilers, overhauling was done within the scheduled time in respect of only three boilers (Boilers 4, 6 and 7). Capital repair of Boiler 8 was done after gap of six years. Percentage of planned shutdown hours against total working hours was in the range of 21.59 *per cent* to 50.82 *per cent* whereas that of forced shut down hours was in the range of 1.94 *per cent* to 5.04 *per cent*. Forced outages were mainly due to tube leakages which could have been reduced with proper repair and maintenance.

- Out of six turbo generators, two (Turbo Generators 6 and 7) were not due for capital repairs as they had not surpassed 50,000 hours from the last capital repairs and remaining four were operated for more than 21,000 to 63,000 hours beyond scheduled capital repair i.e. 50,000 hours. Original Equipment Manufacturer of Turbo Generator 2 had recommended for scheduled capital repair after 45,000 hours of running, whereas the last repair was done in March 2009. Management did not overhaul the equipment even after running of 93,736 hours.

(Paragraph 3.3.2.3)

Recommendation 2: The Company may ensure that the boilers and turbo generators are repaired and maintained as per the norms fixed by the Management to reduce the shutdown hours.

- Percentage of un-burnt carbon in fly ash and bottom ash was more than the norms in the boilers. Since boilers were in continuous use over more than thirty years, various sections of these boilers such as structural elements, pressure parts, refractory lining, ducts etc., were badly damaged resulting in air ingress in large amount causing high un-burnt carbon levels, partial loading of coal, low efficiency etc. Thus, due to higher percentage of un-burnt carbon in fly ash and bottom ash against norms, 2.69 lakh tonnes of un-burnt carbon equivalent to ₹284.41 crore value of coal was not utilised.

- As per the Energy Audit report (2016), boiler thermal efficiency above or equal to 84 *per cent* is very good, equal to or above 80 *per cent* is good and below 80 *per cent* needs corrective action. Boiler thermal efficiency in all the boilers (except 6,7, 8 and 9) was below 80 *per cent* (ranging between 50 *per cent* and 74 *per cent*) during 2016-17 to 2020-21, which indicated that corrective action was required to be taken.

(Paragraph 3.3.2.4)

Recommendation 3: The Company may make efforts to reduce unburnt carbon in boilers to reduce the consumption of coal and take appropriate steps to address the issues raised by the Energy Audit.

- Projects related to replacement/augmentation of boilers, replacement of steam pipelines, solar power units that were envisaged to improve its performance were not implemented.

(Paragraph 3.3.3)

Recommendation 4: Company may expedite its efforts to complete the solar power units so as to utilise its investment fruitfully and to supply green power.

- Bokaro Power Supply Company could not achieve Central Electricity Regulatory Commission norms in respect of operational parameters like Plant Load Factor, consumption of steam, Station Heat Rate etc. Company was not able to operate at minimum Plant Load Factor based on the total requirement of Bokaro Steel Plant which resulted in shortfall in generation of 1,398 million units of power during 2016-17 to 2020-21 and loss of profit margin of ₹49.47 crore.

- Excess consumption of steam beyond the norms resulted in loss of generation of power by 236.52 million units with profit margin of ₹8.36 crore during 2016-17 to 2020-21.

(Paragraph 3.3.4)

Recommendation No. 5: The Company may make efforts to improve its operational parameters like Plant Load Factor, Consumption rate of Steam and Station Heat Rate and bring it at par with other comparable units so that no further loss is incurred on account of higher cost.

- Bokaro Power Supply Company procured lower quality of coal from Bharat Coking Coal Limited even though there was scope of procurement of superior quality of coal from Central Coalfields Limited which resulted in extra expenditure of ₹10.47 crore during 2020-21. Bokaro Power Supply Company could not avail rebate of ₹41.38 crore on excess ash content from Central Coalfields Limited and Bharat Coking Coal Limited in absence of third party sampling.

- Bokaro Power Supply Company received 11,140 tonnes of stone/boulders valuing ₹4.50 crore during 2016-17 to 2020-21. The Company did not raise the issue with the coal companies.

(Paragraph 3.3.5)

Recommendation No. 6: The Company may make effort to reduce procurement of coal having poor calorific value and high ash content and regularly monitor the quality of coal through third party sampling.

- Bokaro Power Supply Company had 17 transformers out of which only 10 had fire protection system till March 2022. The remaining seven were installed and commissioned by 14 November 2022.

(Paragraph 3.3.6)

The Company did not implement the instructions of Ministry of Environment, Forest and Climate Change regarding emissions of dust and gases from power plants. Audit noted that total 28.95 lakh cubic metres of ash was generated by the Company during 2016-17 to 2020-21. However, 33.55 lakh cubic metre of ash was utilised by the Company during the above period. The Company utilised mostly the current generated ash and disposal of legacy ash accumulated over the years was very slow. There was an accumulation of 29.77 lakh cubic metre of legacy ash as on 31 March 2023, which was yet to be disposed off.

(Paragraph 3.3.7)

Recommendation No. 7: Bokaro Power Supply Company may make all efforts to set up the Wet type Flue Gas Desulphurisation system as recommended by the consultant relating to emission of various gases to avoid any penalty from Ministry of Environment, Forest & Climate Change.

Recommendation No. 8: Bokaro Power Supply Company may make all efforts to utilise/dispose the legacy ash in order to comply with the notification of Ministry of Environment, Forest & Climate Change. The matter of utilisation of pond ash for road construction may also be actively followed up with NHAI.

Chapter-I

Setting-up of a greenfield airport in Pakyong, Sikkim

CHAPTER I: Ministry of Civil Aviation

Airports Authority of India

Setting-up of a greenfield airport in Pakyong, Sikkim

1.1 Introduction

Sikkim is a land locked mountainous State having international borders with Nepal, Bhutan and Tibet. It also has border with the State of West Bengal. It was envisaged that establishing of air link would play a major role in developing the economy of the State as well as increasing the employment and contribution to balanced regional growth of Sikkim. At present, the nearest railway station and airport are New Jalpaiguri and Bagdogra respectively (both in the neighboring state of West Bengal). Railway Station at New Jalpaiguri is 120 kilometres from Gangtok, capital of Sikkim whereas Bagdogra airport is 125 kilometres from Gangtok. Pakyong, a sub-divisional town of East district of Sikkim is approximately 33 kilometres from Gangtok.

Airports Authority of India considered (June 2001) the feasibility and suitability of five sites, namely, Saddam, Namchi, Chemchey, Ranka village and Pakyong, for development of an airport for 50-seater class of aircraft operation under fair weather condition only. Finally, Pakyong, a sub-divisional town of East Sikkim, situated approximately 33 kilometres from Gangtok was selected (2001) as the site for setting up the first greenfield airport of Sikkim. Topographically, Pakyong airport has a runway stretching from north to south which abruptly descends into a surrounding valley. The area on the western side of the airstrip is uphill while on the eastern side, it is downhill. This peculiarity required cutting of uphill slopes and using the same material to fill up the downhill area in order to develop the airstrip.

Figure 1.1: Pakyong Airport, Sikkim

Figure 1.2: Pakyong Airport Terminal building

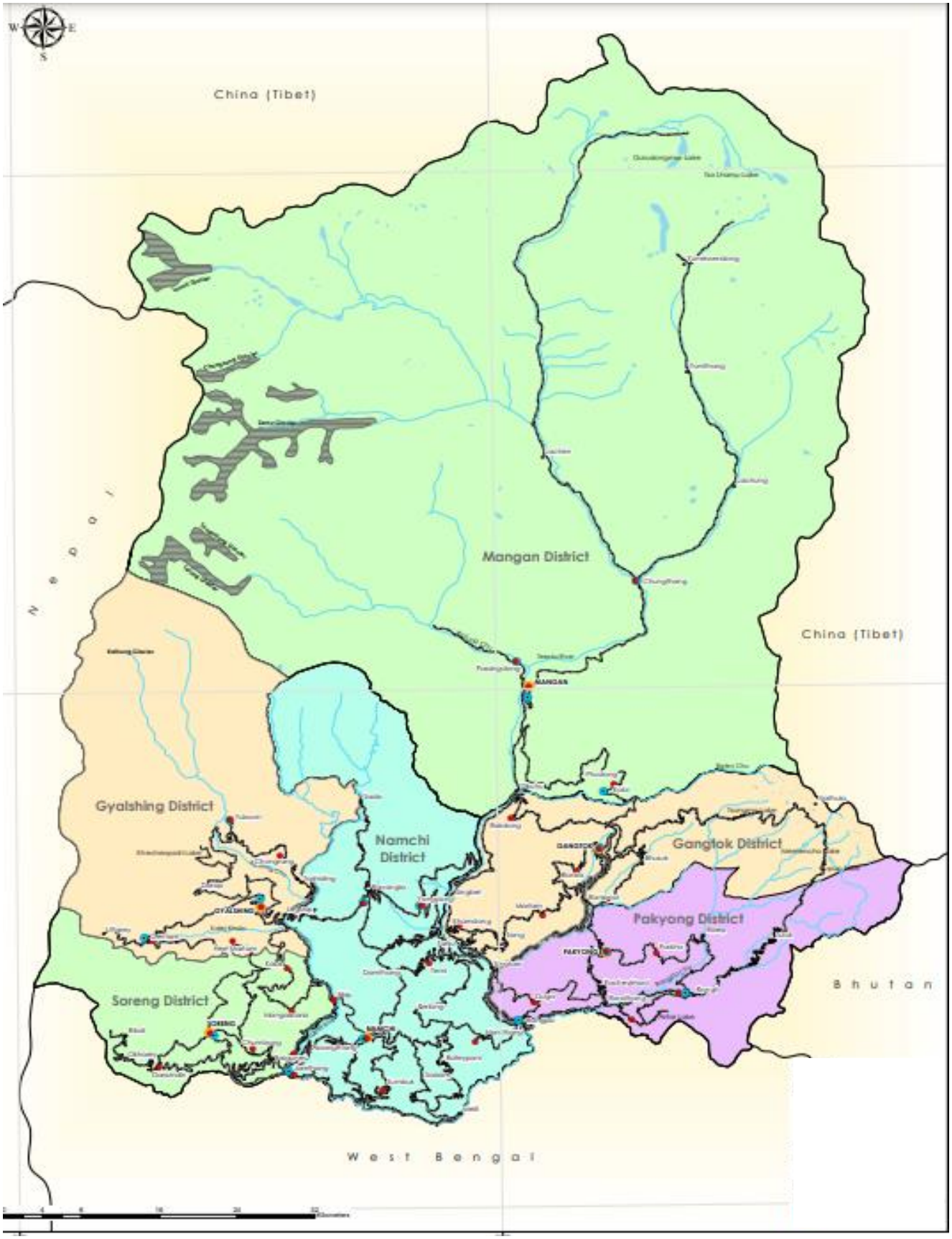

Figure 1.3: Map of Sikkim

(Source: Website of State Government of Sikkim)

1.1.1 Project cost of the Pakyong Airport

Government of Sikkim entered into (March 2002) a Memorandum of Understanding with Airports Authority of India to construct the greenfield airport. It took more than six years to get clearances from various authorities i.e., Ministry of Defence, Government of India, Ministry of Civil Aviation, Government of India and Ministry of Environment, Government of Sikkim. The Project was, however, finally approved by Government of India in October 2008 with scheduled completion by January 2012. Detailed Project Report for the project as a whole was prepared by M/s Mott MacDonald Pvt. Ltd and was submitted in January 2009. Approved cost was ₹309.46 crore which was later (June 2017) increased to ₹553.53 crore. The construction work commenced in January 2009. Airports Authority of India engaged three private parties viz., M/s Mott MacDonald Pvt. Ltd. for technical consultancy, M/s Punj Lloyd Ltd. for earth work in cutting and filling, geo-grid reinforced retaining wall, drainage system including box culvert, aerodrome pavement etc., and M/s PABSCON for construction of the terminal building, control tower cum fire station etc. The project cost was to be borne by Government of India and Airports Authority of India in 9:1 ratio. Till March 2022, the cost of construction of the airport was ₹708.46 crore, out of which Government of India grant was ₹448.09 crore. In the meantime, Pakyong Airport was included (September 2018) in the "*Ude Desh ka Aam Nagrik* (UDAN)" Regional Connectivity Scheme and the Authority received ₹164.38 crore as Regional Connectivity Scheme grant.

1.1.2 Audit objectives

- To assess whether due diligence was exercised by Airports Authority of India while planning and executing the construction works for the Airport.
- To assess the performance of Airport after its operationalistion and analysing reasons for deficiencies, if any.
- To assess whether the objectives of including the Pakyong airport under Regional Connectivity Scheme were fulfilled.

1.1.3 Audit scope and criteria

Audit covered decisions taken by Airports Authority of India relating to conceptualisation, planning, approval, financing, execution, completion, initial operationalisation and suspension as well as resumption of operations of Pakyong airport. Further, the effectiveness of including Pakyong airport in Regional Connectivity Scheme – '*Ude Desh Ka Aam Nagrik (UDAN)'* has also been reviewed.

Criteria for conducting the Compliance Audit included Civil Aviation Requirements and guidelines as issued by the Directorate General of Civil Aviation, guidelines issued by Ministry of Civil Aviation, Government of India, guidelines and study reports issued by the International Civil Aviation Organisation, relevant files and correspondences, Detailed Project Reports, tender committee deliberations etc., in connection with the construction as well as operationalisation of the airport.

1.2 Audit findings

1.2.1 Planning and execution of the airport

1.2.1.1 Adoption of improper design of slope cutting

In May 2003, a high-level meeting was held among Government of India, Government of Sikkim and Airports Authority of India wherein it was decided that a Geo Technical Consultant for undertaking special soil investigation, design of retaining wall etc., may be appointed to facilitate the execution of project works of Pakyong airport. Accordingly, Airports Authority of India appointed (May 2003) Jadavpur University, Kolkata as a Geo Technical Consultant for undertaking special soil investigation, design of retaining wall etc. to facilitate the execution of project works of Pakyong airport. The report submitted (December 2004) by Jadavpur University analysed the slope protection[1] on uphill and downhill sides as well as revised cost thereon and gave the following recommendations:

i. Requirement of acquisition of additional land of 77 acres.

ii. On the uphill side, soil reinforcement was not to be considered and suitable slopes with artificial embankment had to be designed. On the other hand, the downhill side slopes would be made with filled up soil.

iii. The slope of the uphill side was recommended at 28 degree angle.

Later, Airports Authority of India appointed (April 2008) M/s Mott MacDonald Pvt. Ltd. as Engineering consultant for construction of the new airport to provide detailed engineering work along with review of the report prepared by Jadavpur University. M/s Mott MacDonald Pvt. Ltd. submitted (January 2009) their report for construction of new airport at Pakyong, Sikkim wherein it was suggested that the angle for hill cutting on the uphill side should be 36 degrees. Airports Authority of India chose to proceed with the recommendations of M/s Mott MacDonald Pvt. Ltd. in respect of cutting angle of uphill side. This resulted in multiple adverse impacts as discussed in detail in succeeding paragraphs. However, nothing was found on record to indicate that a comparative analysis was done on recommendations of Jadavpur University and those of M/s Mott MacDonald Pvt. Ltd. before deciding to go ahead with recommendations of latter.

(A) Ground subsidence and local agitations due to adoption of inappropriate angle

Based on the report of M/s Mott MacDonald Pvt. Ltd., Airports Authority of India awarded (January 2009) construction work of the airport to M/s Punj Lloyd Ltd. The earthwork involved was critical for smooth completion of the project as well as all other civil works[2]. But major as well as minor cracks started to develop (November 2013) in the houses in and around the uphill side area of the airport during the progress of the project. This led to agitation by the locals and project work was partially stalled in multiple phases during November 2013 to September 2015. In the meantime, Airports Authority of India had to disburse compensation in three tranches

[1] ***Slope stabilisation/protection refers to any implemented technique that aims to stabilise an unstable or inadequately stable slope. The purpose of slope stabilisation techniques is to increase the factor of safety of a slope to a level that is considered adequate.***

[2] ***Like construction of terminal building, construction of roads, Air Traffic Control tower etc.***

(September 2014, July 2015 and December 2019) to the tune of ₹84.64 crore to the affected house owners to resume the construction works. Therefore, acceptance of improper design ultimately affected the execution phase of project works leading to cost overrun as well as time overrun.

The Management stated (July 2021) that the adoption of 28 degree slope cutting on the uphill side would have resulted in huge earthwork causing a logistical issue and huge financial burden for Airports Authority of India. Moreover, less slope on uphill would have increased the height of land fill from 80 metres to 100 metres and even higher which might have resulted in creating more instability issues on the downhill side. As such, they adopted an angle of 36 degree slope for cutting of the hill as suggested by the consultant M/s Mott MacDonald Pvt. Ltd. and the same was analysed by Indian Institute of Technology, Mumbai.

The reply of the Management needs to be viewed in the light of the fact that they submitted (September 2016) to the Dispute Resolution Board[3] that advice of M/s Mott MacDonald in respect of hill cutting angle of 36 degree on the uphill side was wrong and this fact was also confirmed by Central Building Research Institute (December 2015). Contention of Management regarding analysis by Indian Institute of Technology, Mumbai could not be verified by Audit as Indian Institute of Technology, Mumbai was not appointed by Airports Authority of India but their opinion was stated to be obtained by M/s Mott MacDonald directly. Further, report of Indian Institute of Technology, Mumbai was not provided to Audit.

Recommendation 1: Airports Authority of India needs to exercise proper diligence while implementing as well as making any subsequent modification to critical drawings/designs.

(B) Escalation and extra work

M/s Punj Lloyd Ltd. was awarded (January 2009) the earth work in cutting and filling, geo-grid reinforced retaining wall, drainage system including box culvert, aerodrome pavement etc., at a cost of ₹264.29 crore with scheduled completion by January 2011. The work was actually completed in May 2018 because of multiple[4] extensions. Such extensions were allowed as ground subsidence[5] relating to uphill slopes occurred during construction. This necessitated extra earthwork of 11.36 lakh cubic metres for soil cutting and filling by M/s Punj Lloyd Ltd. beyond the original scope of awarded work. Further, extra work was also carried out in connection with construction of geo-grid retaining walls and drainage works. This led to an excess expenditure of ₹74.58 crore on account of such escalations and extra works directly attributable to adoption of improper design of M/s Mott MacDonald Pvt. Ltd.

Similarly, M/s PABSCON was awarded (April 2013) the work for construction of terminal building for ₹43.44 crore with scheduled completion by March 2015. The same was actually completed in February 2018 at a cost of ₹46.21 crore. This delay of 35 months was attributed primarily to agitation by local people for damages to their houses in the local periphery resulting

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[3] ***Matter went into Dispute Resolution Board and Airports Authority of India claimed an amount of ₹ 125.14 crore from M/s Mott MacDonald for recommending improper slope cutting angle.***

[4] ***Six times (first extension till January 2012, second till July 2012, third till April 2013, fourth till March 2014, fifth till March 2015 and sixth till August 2018).***

[5] ***A gradual settling or sudden sinking of the earth's surface due to removal or displacement of subsurface earth materials***.

from ground subsidence of uphill side due to adoption of improper design as provided by M/s Mott MacDonald Pvt. Ltd. For such idle period, M/s PABSCON demanded cost escalation and Airports Authority of India had already released an additional amount of ₹2.77 crore[6]. Thus, an excess expenditure of ₹77.35 crore was paid to two contractors (M/s Punj Lloyd and M/s PABSCON) on account of escalations and extra works due to adoption of improper design of M/s Mott MacDonald Pvt. Ltd.

While accepting the fact of additional expenditure, the Management stated (July 2021) that payment of escalation was made to both contractors due to total stoppage of work by villagers whose houses got damaged.

Reply of the Management is to be viewed in light of the fact that the stoppage of work was due to agitation by villagers against damages to their houses in the periphery of the airport which resulted from adoption of improper design for uphill slope cutting.

(C) Additional expenditure after project completion

Post completion of project activities at Pakyong airport, Airports Authority of India was compelled to take action to mitigate the problems occurring due to ground subsidence from the uphill slope on the western side of the airport. Details of avoidable actions are stated below:

i) One work order was issued (August 2018) to M/s Geo Spar & Sew Joint Venture for concrete cladding wall to maintain the uphill slope on the western side of the basic strip at Pakyong airport at a cost of ₹108.63 crore. The scheduled completion of the work was November 2019. The work for concrete cladding wall was completed to the extent of 62.50 *per cent* at a cost of ₹97.09 crore till March 2022.

ii) Another work order was issued (December 2018) to M/s Spar Geo Infra Private Limited for strengthening the base of the retaining wall at a cost of ₹29.74 crore with scheduled completion by February 2020. The job for strengthening the base of the retaining wall was achieved to the extent of 92 *per cent* by incurring ₹45.27 crore till March 2022.

iii) Further, Airports Authority of India had to acquire 7.42 acres of additional land by paying ₹10.18 crore for dumping the excavated materials from the uphill slope as a result of above additional works.

Audit observed that had the Management adopted appropriate design for slope cutting at the planning stage, Airports Authority of India could have saved avoidable expenditure of ₹314.53 crore[7] as of March 2022 which is likely to increase further.

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6 ***(₹46.21crore - ₹43.44 crore) = ₹2.77 crore.***

7 ***₹84.64 crore + ₹77.35 crore + ₹152.54 crore as mentioned in paras 1.2.1.1 (A), (B) and (C) respectively.***

Figure 1.4: Ongoing work of concrete cladding wall

Figure 1.5: Ongoing work of strengthening the base of the retaining wall

The Management stated (July 2021) that the works for strengthening the base of reinforced earth wall and the cladding wall for uphill slope were taken based on the expert study on enhancing the safety of the airport infrastructure and to ensure the runway strip of 75 metres on both sides of runway center line.

Reply of the Management needs to be viewed in light of the fact that main reason behind these additional works was adoption of improper design for slope cutting by the Management.

Recommendation 2: Adequate control measures including inter-alia financial controls may be exercised by Airports Authority of India while executing projects in order to avoid time and cost overrun.

1.2.1.2 Delay in conducting aeronautical study

During planning stage of the airport, Directorate General of Civil Aviation instructed Airports Authority of India (November 2004) to carry out an aeronautical study[8] prior to according 'No Objection Certificate' for the Pakyong airport project. In reply to Authority's repeated requests for exempting them from such study, Directorate General of Civil Aviation reiterated the necessity of such aeronautical study to determine the impact of obstacles[9] in the transitional surface[10]. Airports Authority of India, however, did not comply with such directives of Directorate General of Civil Aviation and continued its project construction activities.

Directorate General of Civil Aviation issued provisional aerodrome licence to Airports Authority of India in May 2018 wherein it was categorically mentioned that an aeronautical study should be done within four months of grant of such licence. However, Airports Authority of India appointed International Civil Aviation Organisation for aeronautical study belatedly in June 2018 and recommendations thereof were received from International Civil Aviation

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[8] ***This study was needed in order to analyse the infringements in the transitional surfaces and availability of obstacle free air space for flight operation in the hilly terrain of the proposed Pakyong airport site.***

[9] ***All fixed (temporary or permanent) and mobile objects that are located on an area intended for the surface movement of aircraft.***

[10] ***A complex surface along the side of the runway strip and part of the side of the approach surface.***

Organisation in April 2019. Meanwhile, flight operations at Pakyong airport were started by SpiceJet in October 2018 without having the results of aeronautical study.

The flights operated intermittently till May 2019 and thereafter remained suspended from June 2019 to January 2021. Subsequently, flights again operated intermittently till October 2022 and thereafter remained suspended till February 2023. Presence of obstacles in the transitional surface and poor visibility were reasons cited by SpiceJet for stopping flight operations from Pakyong airport. Presence of obstacles in transitional surface was also flagged by the International Civil Aviation Organisation as a 'Class-I hazard'[11] in their aeronautical study report.

Thus, had Airports Authority of India conducted aeronautical study as recommended by Directorate General of Civil Aviation in the initial stages of construction of Pakyong airport, corrective measures for flight operations could have been taken earlier and operations would have been smooth.

The Management replied (July 2021) that preliminary study of obstacles and aeronautical feasibility study was carried out at the site selection stage of Pakyong airport.

The reply of the Management needs to be viewed in light of the fact that had the obstacle limitation surface survey been sufficient and acceptable to Directorate General of Civil Aviation, it would not have insisted for aeronautical study despite repeated requests by Airports Authority of India for exemption from the same and SpiceJet would not have cited the presence of obstacles in the transitional surface as one of the primary reasons for stoppage of flight operations.

Recommendation 3: Airports Authority of India may ensure that all the relevant studies as recommended by various regulatory bodies are conducted prior to commencement of Projects.

1.2.1.3 Failure to recover an amount of ₹25.92 crore from the contractor

Airports Authority of India entered (January 2009) into an agreement with M/s Punj Lloyd Ltd. for earth work in cutting and filling, geo-grid reinforced retaining wall, drainage system including box culvert, aerodrome pavement etc. for construction of the new greenfield airport at Pakyong at a cost of ₹264.29 crore.

As per the agreement, certain recoveries such as non-deployment of machineries, inadequacy of test results, liquidity damages etc., were to be made from successive Running Account Bills of M/s Punj Lloyd Ltd. While evaluating the last and final Running Account Bill (April 2019), Airports Authority of India found that ₹25.92 crore was due to be recovered from M/s Punj Lloyd Ltd.

Audit observed that Airports Authority of India failed to make necessary deductions from earlier Running Account Bills submitted by M/s Punj Lloyd Ltd. This indicated absence of financial control and supervision on the part of Airports Authority of India to ensure that all relevant recoveries were ensured prior to release of payment to M/s Punj Lloyd Ltd. before

[11] ***Implies that risk cannot be justified under any circumstances.***

finalising the final Running Account Bill. Further, M/s Punj Lloyd Ltd. has become bankrupt and has been referred to National Company Law Tribunal, hence, the chances of recovery of ₹25.92 crore **(Annexure-I)** appear to be remote.

While accepting the fact, the Management stated (July 2021) that they are holding ₹17.97 crore of the contractor which was awarded by Arbitrator in favour of contractor.

The fact remains that chances of recovery of remaining amount i.e., ₹7.95 crore are remote due to poor financial management.

Recommendation 4: Adequate internal controls should be put in place by Airports Authority of India while releasing the contractor's payments and responsibility should be fixed in case of any lapses.

1.2.2 Operationalisation of the airport

1.2.2.1 Inadequate emphasis on meteorological data

Pakyong airport, located at 1500 metres above the mean sea level, was proposed to be an airport that would follow Visual Flight Rules[12] under fair weather conditions for both take-off and landing of the aircrafts. International Civil Aviation Organisation's Rules of the Air (2005), stipulate that an airport located at an altitude of 900 metres (up to 3050 metres) above mean sea level should be having a clear visibility of 5 kilometres.

After the commencement of commercial operations (October 2018), SpiceJet was able to operate flight services for 125 days only out of 231 days during its initial eight months' of operations (October 2018 to May 2019). Thereafter, flight services remained suspended from June 2019 to January 2021 and again from October 2022 till February 2023. One of the main reasons for such low flight operations was poor visibility as stated by the flight operator.

Audit observed that meteorological data, as considered by Airports Authority of India while preparing Detailed Project Report for the Pakyong Airport project, pertained to Gangtok, which is approximately 33 kilometres away from Pakyong. Further, analysis of the same data set revealed that number of available days with visibility of more than 5 kilometres was not adequate[13] even in Gangtok. Going for project based on meteorological data of Gangtok indicates that adequate emphasis was not given to the meteorological data before planning the airport. Had such emphasis been given, Airports Authority of India could have considered other viable options including adoption of technological advancements for mitigating this constraint of poor visibility thereby enabling regular flight operations at Pakyong airport.

The Management stated (July 2021) that the meteorological data was analysed adequately during the planning stage and the same was duly captured in the Detailed Project Report.

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[12] ***Visual Flight Rules simply means that the aircraft is intended to operate in visual meteorological conditions.***

[13] ***As per Detailed Project Report, visibility of above 4 kilometres was projected only for 244.1 days (66.87 per cent of a year) in a year.***

Reply of the Management is not tenable as the meteorological data captured in Detailed Project Report was for Gangtok which was 33 kilometres away from the site of airport at Pakyong. Further, M/s SpiceJet Ltd. could operate only 54 *per cent*[14] of scheduled flights during the first eight months following commencement of commercial flight operations. Primary reason cited by M/s SpiceJet Ltd. for this disruption of flight services was poor visibility of less than 5 kilometres.

1.2.2.2 Inadequate Length of Runway

As per Aerodrome Design Manual of International Civil Aviation Organisation, the basic length is the runway length selected for aerodrome planning purposes which are required for take-off and landing under standard atmospheric conditions for zero elevation, zero wind and zero runway slope. After that the required runway length should be determined by the following correction factors for elevation, temperature and slope:

i. The basic length selected for the runway should be increased at the rate of 7 *per cent* per 300 metres of elevation,
ii. The length of runway determined above should further be increased at the rate of one *per cent* for every one degree centigrade by which the aerodrome reference temperature exceeds the temperature in the standard atmosphere for aerodrome elevation;
iii. Where the basic length determined by take-off requirements is 900 metres and over, runway length should be further increased at the rate of 10 *per cent* for each *per cent* of the runway slope.

Audit observed that the Aeroplane Reference Field Length for Bombardier Q-400 aircraft is 1300 metres at mean sea level under Standard Atmosphere conditions. Considering the elevation, reference temperature and runway longitudinal slope of Pakyong airport, the effective Aeroplane Reference Field Length[15] for Q-400 turns out to be 2,260 metres **(Annexure-II)**. The available runway length of Pakyong airport is 1,700 metres only. Thus, the actual runway length of Pakyong airport was lesser than the required runway length by 560 metres.

The Management stated (July 2021) that the required runway length had to be determined with corrections on elevation, temperature and the runway slope and the runway at Pakyong airport was designed considering the operation of ATR 42-500 and ATR 72-500 types of aircraft.

Reply of the Management regarding available length of runway is irrelevant in the present context as M/s SpiceJet Ltd. is operating Bombardier Q-400 aircrafts at Pakyong airport which is high-end aircraft compared to ATR 42/72 type aircraft.

[14] ***125 days only out of 231 days during October 2018 to May 2019.***
[15] ***As recommended in International Civil Aviation Organisation Manual.***

Figure 1.6: Runway at Pakyong airport, Sikkim

1.2.2.3 Runway End Safety Areas

The Detailed Project Report of Pakyong airport envisaged that the length of the Runway End Safety Area[16] at both ends of the runway should be 150 metres. However, Audit observed that the length of Runway End Safety Area available (May 2018) at the northern end (Runway 20 end) of the runway at Pakyong airport was only 70 metres while that at the southern end (Runway 02 end) was only 90 metres.

Figure 1.7: Runway End Safety Area at RWY02

Figure 1.8: Runway End Safety Area at RWY20

The Management accepted that the length of Runway End Safety Area available at Pakyong airport was inadequate in respect of Q-400 aircraft operations and the same fact has been notified[17].

Reply of the Management that matter regarding inadequate Runway End Safety Area has been notified through Notice to Airmen is not justified as Notice to Airman is only one type of

[16] ***Directorate General of Civil Aviation has defined Runway End Safety Area as an area symmetrical about the extended runway center line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.***

[17] ***Through Notice to Airmen.***

alert/information to the airline operator and it never entirely mitigates the risk posed by insufficient length of Runway End Safety Area.

Recommendation 5: Airports Authority of India may take suitable measures to address safety concern issues regarding deficiency in availability of adequate length of runway as well as Runway End Safety Area for flight operations with Bombardier Q-400 aircraft.

1.2.2.4 Non-compliance of International Civil Aviation Organisation recommendation on navigational aids

Doppler Very High Frequency Omni Range/Distance Measuring Equipment and Very High Frequency radio (a navigational aid for enroute and terminal navigation) were installed at Pakyong airport at a cost of ₹1.44 crore in February 2018. Further, an expenditure of ₹0.78 crore was incurred for construction of Doppler Very High Frequency Omni Range building. During calibration (March 2018) of those equipment, it was identified that these devices were not functioning optimally due to surrounding hilly terrain. In April 2019, International Civil Aviation Organisation flagged this as hazard in their Aeronautical Study Report and recommended the installations of repeaters[18] to enhance the signals from such navigational aids.

Audit observed that the Management had not installed repeaters (April 2021) to enable proper functioning of navigational aids. Further, the Management knew that Doppler Very High Frequency Omni Range/Distance Measuring Equipment and Very High Frequency radio would not be able to function optimally even prior to its commercial operation of the airport. Had the Management got the aeronautical study conducted by International Civil Aviation Organisation as directed by Directorate General of Civil Aviation prior to operationalisation of the airport, the corrective measures as recommended by International Civil Aviation Organisation would have already been adopted.

The Management stated (July 2021) that necessary Notice to Airmen had been published for flight operator regarding the limitations of Doppler Very High Frequency Omni Range/ Distance Measuring Equipment. It was also stated that though International Civil Aviation Organisation recommended for installation of repeater but the same had not been installed due to high terrain.

Reply of the Management needs to be viewed in light of the fact that issuing Notice to Airmen did not relieve Airports Authority of India from its primary responsibility for safety of the flight operations. Further, International Civil Aviation Organisation recommended to install repeater for aiding safe flight navigation with high terrain situation of Pakyong airport which is yet to be done.

1.2.2.5 Inconsistency between the aerodrome licence and aircraft operator's licence

Airports Authority of India submitted (April 2018) application for an aerodrome licence to Directorate General of Civil Aviation to operate Pakyong airport commercially. The application

[18] ***In telecommunications, a repeater is an electronic device that receives a signal and retransmits it. Repeaters are used to extend transmissions so that the signal can cover longer distances or be received on the other side of an obstruction.***

inter alia sought permission to operate the airport under Aerodrome Reference Code "3C" and the aircraft proposed to be operated therefrom was ATR-72 only**.** As per the manuals of International Civil Aviation Organisation as well as Directorate General of Civil Aviation, for an airport to have Reference Code "3C", Aeroplane Reference Field length should be between 1,200 metres to 1,800 metres.

Moreover, reference code "3C" for a non-instrument runway like Pakyong requires a basic strip of at least 75 metres on either side of the centre line of the runway. Therefore, the Directorate General of Civil Aviation turned down (April 2018) the application as only 40 metres to 59 metres of basic strip width from the runway centre line was available for a length of 900 metres due to presence of steep hill on the western side at Runway 02 end. Directorate General of Civil Aviation further advised Airports Authority of India to submit a revised application seeking '2C' aerodrome licence keeping in view the available infrastructure at Pakyong airport.

Consequently, Airports Authority of India submitted (April 2018) revised application with Aerodrome/airport reference code "2C"[19]. Finally, Directorate General of Civil Aviation granted (May 2018) provisional aerodrome licence for Pakyong airport for a period of six months with effect from May 2018 to November 2018 under Aerodrome Reference code "2C" for the proposed aircraft ATR-42 500/600 under Day- Visual Flight Rules[20]. Eventually, such licence was further renewed from November 2018 to May 2020 and further till May 2022.

Scrutiny of records revealed that Ministry of Civil Aviation/Airports Authority of India entered (September 2018) into agreements with the Selected Airline Operator (M/s SpiceJet) for flight operations from Pakyong airport under the Regional Connectivity Scheme. The agreements stipulated that M/s SpiceJet should deploy Q-400 aircraft (a "3C" Category aircraft) for provision of flight services from Pakyong airport.

Audit observed that Directorate General of Civil Aviation provided "2C" aerodrome licence to the Airports Authority of India on the basis of Civil Aviation Requirements (Aerodrome Standards and Licencing) as a runway strip of 40 metres to 59 metres was available on western side of runway centre line. But code "3C" aircraft operated by SpiceJet requires runway strip of 75 metres on each side of runway centre line. However, it provided permit for operation of "3C" aircraft to SpiceJet.

Directorate General of Civil Aviation stated (May 2023) that detailed assessment of Pakyong airport was carried out by team consisting of members from DGCA, Airports Authority of India and SpiceJet in the year 2018. Subsequently, based on the safety risk assessment and risk mitigation measures proposed, the Standard Operating Procedure for operations of Q-400 type of aircraft was approved without compromising on flight safety. It was further stated that "2C" aerodrome licence was granted to Airports Authority of India keeping in view the available infrastructure and the same is valid till May 2024.

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[19] ***An airport would be having Reference Code "2C", if Aeroplane Reference Field length is between 800 metres to 1,200 metres.***

[20] ***Day-Visual Flight Rules means flights shall be conducted so that the aircraft is flown in conditions of visibility and distance from clouds during daytime.***

The reply needs to be viewed in light of the fact that Directorate General of Civil Aviation issued two inconsistent licences to Airports Authority of India and SpiceJet and also that the aircraft being operated by SpiceJet was of a higher category than permitted for category of licence given for the airport. This may also be viewed in the light of the fact that the provisions of International Civil Aviation Organisation's Manual were not followed when the licence for operation of a higher category aircraft was given to SpiceJet.

Recommendation 6: Airports Authority of India should ensure compliance to conditions/requirements of Directorate General of Civil Aviation/International Civil Aviation Organisation during the operations at Pakyong airport.

1.2.2.6 Flight landing navigational procedure

The flight operations at the Pakyong airport commenced initially from October 2018. Since inception of such commercial operations, the airport experienced the issue regarding cancellation of the scheduled flights due to visibility issue and this had continued till the suspension of flight operations from June 2019. In this regard, the aeronautical study report as submitted (April 2019) by International Civil Aviation Organisation recommended following solutions for continuity of aircraft operations at Pakyong:

i. Required Navigation Performance Authorisation Required (RNP AR[21]) 0.1 approach at the southern side of the runway, and
ii. RNP 1 departure from the northern side of the runway.

Following a discussion (in November 2019) among the stakeholders viz., Airports Authority of India, SpiceJet, Directorate General of Civil Aviation and Indian Meteorological Department on the above recommendations, M/s SpiceJet informed (December 2019) that their current aircrafts were not capable of adopting such solution as the same was not developed by the Original Equipment Manufacturer of the aircraft. During another round of discussions in January 2020, SpiceJet informed that Original Equipment Manufacturer of their aircraft had not planned any upgradation to include the recommendation of International Civil Aviation Organisation as it would involve huge cost and lengthy certification process.

Thereafter, Airports Authority of India submitted (August 2020) another navigational approach procedure (RNP Y i.e., RNP APCH at RWY02) to Directorate General of Civil Aviation for approval and the same was approved in November 2020. The said approach procedure was suitable for Category 'A/B' aircraft[22] due to obstacle environment and available airport infrastructure. This procedure would also improve access to the airport and safety by providing runway aligned stabilised approach and provide sufficient reaction time. The flight operations in Pakyong airport were resumed from January 2021, however, the suitable aircraft like ATR-42/ATR-72 which would be compatible with the navigational approach procedure was not deployed by the Selected Airline Operator.

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[21] ***Required Navigation Performance is a family of navigation specifications under Performance Based Navigation which permit the operation of aircraft along a precise flight path with a high level of accuracy and the ability to determine aircraft position with both accuracy and integrity. This offers safety benefits by means of its precision and accuracy and it reduces the cost of operational inefficiencies.***

[22] ***Category-A aircrafts refer to those aircrafts whose wing span is less than 15 metres and Category-B aircrafts refer to those aircrafts whose wing span is more than 15 metres but less than 24 metres.***

Audit observed that though the constraints of visibility at Pakyong airport were known to the Management since conceptualisation of the project, Airports Authority of India failed to explore the best possible method to resolve the problem. This was despite the fact that the same was made available by International Civil Aviation Organisation vide its Performance Based Navigation Manual in 2008. Audit also observed that the aircraft operated by the Selected Airline Operator was not compatible with the navigational procedure as approved by Directorate General of Civil Aviation.

The Management accepted (July 2021) the fact and stated that they had not explored the appropriate flight landing navigational procedure although the same was made available by International Civil Aviation Organisation in 2008 vide its Performance Based Navigation Manual due to high equipage cost. This indicated the failure of the Management towards adoption of appropriate flight landing navigational procedure.

Recommendation 7: Directorate General of Civil Aviation/Airports Authority of India must ensure compliance with the category of licence issued for Aerodrome/Aircraft to ensure safety of flight operations. For Pakyong airport, responsibility needs to be fixed for permitting operation of aircrafts which were not compatible with infrastructure as well as aerodrome licence.

1.2.2.7 Non-adherence to conditions of Regional Connectivity Scheme Agreement

Government of India launched the Regional Connectivity Scheme *Ude Desh Ka Aam Nagrik* (UDAN) in December 2016 as a component of the National Civil Aviation Policy 2016. The primary objective of the Scheme was to stimulate regional air connectivity by making it affordable. Pakyong airport was brought under the ambit of UDAN Scheme in August 2017. M/s SpiceJet Limited emerged as the lowest bidder[23] interested in scheduled commercial flight operations in two[24] Regional Connectivity Scheme networks.

Subsequently, Selected Airline Operator Agreements were signed (September 2018) between Airports Authority of India and SpiceJet Limited with following conditions:

- Operating seven flights per week in the assigned Regional Connectivity Scheme networks which comprised of 10 routes.
- SpiceJet was selected exclusive operator for three years under Regional Connectivity Scheme.
- 39 seats should be reserved as Regional Connectivity Scheme seats.
- The maximum air fare would range between ₹2,570 to ₹3,470.
- The viability gap funding to M/s SpiceJet could range from Nil to ₹4,000.[25]

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[23] ***Based on the bids submitted by them in response to Notice Inviting Proposals for Selection of Airline Operators under the Regional Connectivity Scheme.***

[24] ***Delhi-Pakyong-Kolkata-Bokaro-Kolkata-Pakyong-Delhi and Kolkata-Pakyong-Guwahati-Pakyong-Kolkata.***

[25] ***In Kolkata-Pakyong-Kolkata route – there was no viability gap funding. However, maximum air fare for a Regional Connectivity Scheme seat should not be more than ₹2,570. For Delhi-Pakyong Delhi segments there would be viability gap funding of ₹4,000 per seat of Regional Connectivity Scheme category but the maximum air fare should not be more than ₹3,470.***

- SpiceJet was to submit on daily basis the details/return regarding flight-wise data of Regional Connectivity Scheme seats and Non- Regional Connectivity Scheme seats sold by them along with airfare collected from passengers to the Authority.

Audit observed that SpiceJet operated only in four out of 10 allotted Regional Connectivity Scheme routes. In order to ascertain whether the benefits envisaged in Regional Connectivity Scheme were actually being passed on to the passengers, Audit called for the obligatory returns, as mentioned above, from the Management. The same were, however, not provided despite repeated requests. Hence, Audit could not get an assurance that the seats reserved under the Regional Connectivity Scheme were actually made available to the targeted passengers at the approved Regional Connectivity Scheme fare.

The Management stated (July 2021) that M/s SpiceJet was operating routes at Pakyong airport without any viability gap funding and the Regional Connectivity Scheme grants received from the Ministry of Civil Aviation had been utilised towards development works undertaken at the airport.

Reply of the Management may be viewed in the light of the fact that objective of Regional Connectivity Scheme was not the saving by non-utilisation of viability gap fund and grants but was to stimulate regional air connectivity by making it affordable. Further, the reply of Management was silent on non-submission of returns by SpiceJet.

1.3 Conclusion

Government of Sikkim entered into a Memorandum of Understanding with Airports Authority of India to construct a greenfield airport at Pakyong, Sikkim with objectives to boost development of the economy of the State as well as increasing the employment and contribution to balanced regional growth. Permission for setting up of this airport was accorded by the Government of India in October 2008 with scheduled completion by January 2012. The Pakyong airport was included under Regional Connectivity Scheme of Government of India in the year 2017. The primary objective of the Scheme was to stimulate regional air connectivity by making it affordable. Till March 2022, cost of construction of airport stood at ₹708.46 crore.

During planning stage of the airport itself, Airports Authority of India was directed by the Directorate General of Civil Aviation in the year 2004 to carry out aeronautical study which was meant to analyse the infringements in the transitional surfaces and availability of obstacle free space for flight operation in the hilly terrain. However, Airports Authority of India appointed International Civil Aviation Organisation for aeronautical study belatedly in June 2018 and recommendations thereof were received from International Civil Aviation Organisation in April 2019. Meanwhile, flight operations at Pakyong airport were started by SpiceJet in October 2018 without having the results of aeronautical study. This led to unresolved issues of obstacles in the transitional surface that impacted flight operations. Further, adequate emphasis was not given to meteorological data as the data considered while preparing Detailed Project Report pertained to Gangtok, which was approximately 33 kilometres away from Pakyong.

The airport was declared ready for commercial operations by Airports Authority of India in May 2018 as against scheduled completion in January 2012. The delay in setting up of Pakyong airport was mainly due to adoption of improper angle for slope cutting of uphill side of the airport due to which cracks started developing in the houses in and around the uphill side area of the airport leading to agitation by locals. Jadavpur University, Geo Technical Consultant appointed by Airports Authority of India initially, had recommended for a slope cutting angle at 28 degree. Subsequently, Airports Authority of India appointed another consultant M/s Mott MacDonald Pvt. Ltd. who suggested the angle to be at 36 degrees. Airports Authority of India proceeded with the recommendation of the latter. Subsequently, Central Building Research Institute confirmed that adoption of angle at 36 degrees was wrong. Project work had to be stalled on many occasions due to ground subsidence and resultant agitation by the locals leading to delays as well as avoidable expenditure of ₹314.53 crore till March 2022 due to compensation paid to locals and extra works.

Due to reasons explained above, commercial operation of flights that could be started in October 2018 was suspended from June 2019 to January 2021 and again from October 2022 till February 2023 due to poor visibility and obstacles in transitional surface. Thus, flights operated only for a total period of approximately 30 months till February 2023.

It was also seen that Director General of Civil Aviation had granted a reference code "2C", to the Pakyong airport which is given to Airports having infrastructure suitable for "2C" types of aircrafts (which are smaller aircrafts). But it provided permit for operation of "3C" aircraft to SpiceJet. Therefore, due to inconsistency between type of airport licence and type of aircraft permitted to be operated from there, SpiceJet operated Bombardier Q-400 aircraft from Pakyong airport which was higher category than permitted for category of licence given for the airport.

Thus, due to various deficiencies in planning and non-compliance with directions of regulatory body, the Project faced various hurdles and operations remained suspended from time to time. Therefore, objective of establishing Pakyong airport as well as bringing it under Regional Connectivity Scheme of Government of India remained unfulfilled.

Chapter-II

Revival of NEPA Limited through Revival and Mill Development Plan

CHAPTER II: Ministry of Heavy Industries

NEPA Limited

Revival of NEPA Limited through Revival and Mill Development Plan

2.1 Introduction

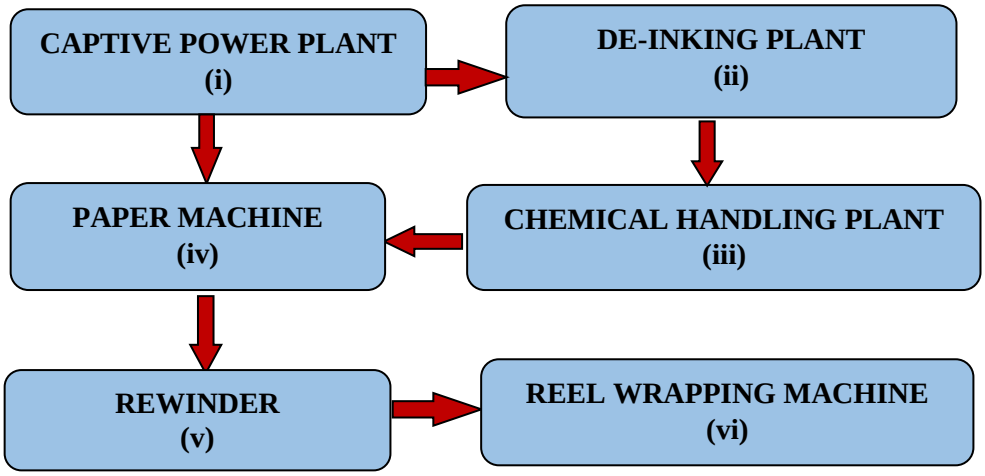
The National Newsprint & Paper Mills Limited was incorporated on 25 January 1947 as a private enterprise under the Indian Companies Act, 1913. The Government of India (GoI) took over the controlling interest by acquiring 51 *per cent* shares of the Company in the year 1958. The name of the Company was changed to NEPA Limited with effect from 21 February 1989. The Company is located at Nepanagar in Burhanpur district of Madhya Pradesh and is under the administrative control of Ministry of Heavy Industries (earlier, Department of Heavy Industry).

The Management of the Company is vested in Board of Directors consisting of the Chairman-cum-Managing Director and five Directors including an Independent Director. As on 31 January 2023, the staff strength of the Company was 548 personnel which comprised 88 Executives, 92 Non-Executives, 53 temporary employees and 315 contractual workers.

The Company's core activity was manufacturing of Newsprint Paper which was carried out through two Paper Machines viz., Paper Machine-1 commissioned in the year 1956 with a rated capacity of 30,000 tonnes per annum (enhanced to 50,500 tonnes per annum in November 1989) and Paper Machine-2 commissioned in the year 1969 with a rated capacity of 37,500 tonnes per annum.

A typical flow diagram of the manufacturing process followed by the Company is given below:

Chart 2.1: Manufacturing Process of Newsprint Paper



(i) Captive Power Plant: Used for generating steam and power for use in paper-making and for energising paper machines and related plants.

(ii) De-Inking Plant: Used for sorting, cutting, pulping and de-inking of waste paper.

(iii) Chemical Handling Plant: Used for mixing chemicals in the pulp for stock preparation.

(iv) Paper Machine: Consists of wire section, press section, dryer section and calendar section and used for processing stock (pulp) into final product viz., paper.

(v) Rewinder: Used for cutting the paper manufactured by Paper Machine in 6 metres width into smaller size and rewind the paper from steel roller to card board roller for making reels.

(vi) Reel Wrapping Machine: Used for wrapping the reels by applying edge, inner and outer surface protector on reels to protect the reels from moisture.

As on 31 March 2022, the Net Worth[26], Capital Employed[27] and Working Capital[28] of the Company were ₹119.72 crore, (-) ₹98.19 crore and (-) ₹112.45 crore respectively. The Company incurred net loss of ₹59.90 crore during 2021-22.

2.1.1 The Road to Revival and Mill Development Plan

NEPA Limited was operating well till the year 1991. It produced and sold 75,040 metric tonnes of newsprint paper and earned a profit of ₹205.89 lakh by registering a sale of ₹112.35 crore during 1991-92. The net worth of the Company was ₹61.56 crore as on 31 March 1992. However, cheaper imports of good quality Newsprint Paper post-liberalisation affected the Company adversely as the cost of Newsprint Paper manufactured/supplied by the Company could not compete with the international rates. Due to procurement of raw material from far off places, ageing equipment and non-availability of proper de-inking facilities, quality of paper produced by the Company was much inferior than the market requirements. The Company, however, continued production by switching over to recycled fibre (old newspapers) based production but without appropriate modification/change in process. Accumulated losses of NEPA continued to increase and its net worth had completely eroded by 31 March 1997.

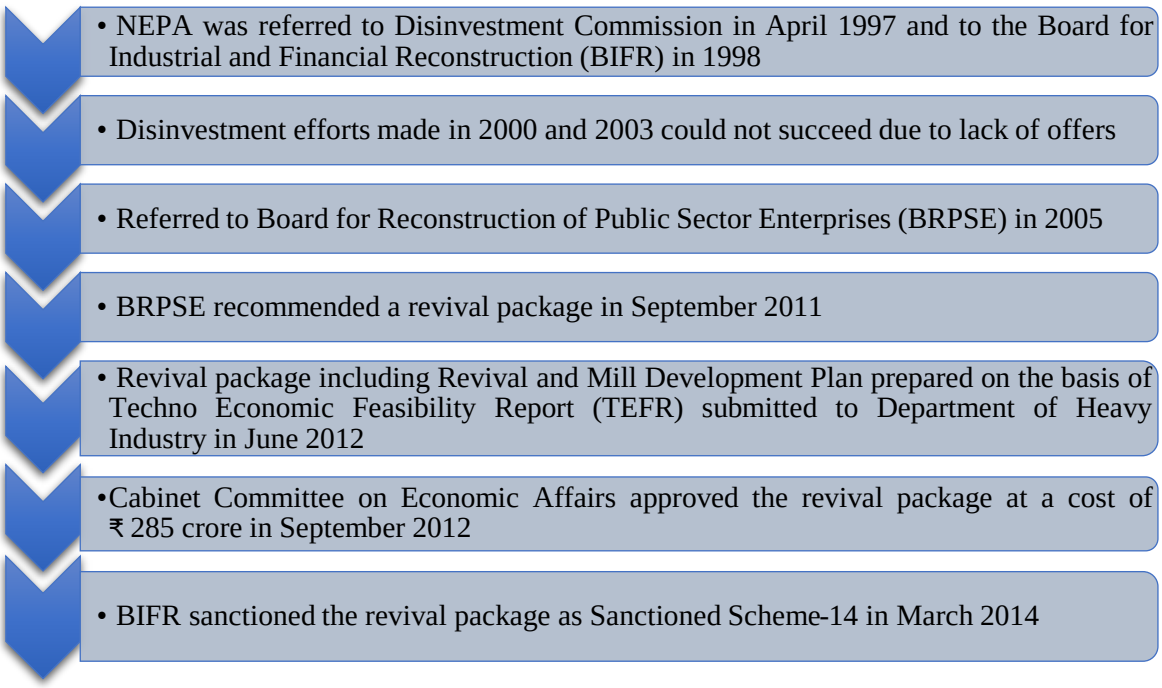
The Board for Industrial and Financial Reconstruction (BIFR) declared NEPA Limited as a sick company in August 1998 and after a series of events, the Revival and Mill Development Plan was approved in September 2012. The chain of events leading to approval of the Revival and Mill Development Plan in the year 2012 is given below:

[26] ***Net Worth represents total of paid-up share capital including share application money and free reserves and surplus.***

[27] ***Capital employed represents Fixed Assets excluding Capital Work in Progress plus Working Capital.***

[28] ***Working Capital represents Current Assets minus Current Liabilities.***

Chart 2.2: Series of events leading to approval of Revival & Mill Development Plan



The originally sanctioned cost of the Revival and Mill Development Plan (i.e., approved capital expenditure) was ₹285 crore to be funded through equity contribution of ₹157 crore from GoI and the balance ₹128 crore as loan from consortium of banks. The sanctioned cost was revised (October 2018) to ₹434 crore to be fully funded as equity contribution from GoI, as NEPA could not arrange the loan from consortium of banks. The sanctioned cost was further revised (October 2021) to ₹512.41 crore. The entire amount of ₹512.41 crore was utilised by the Company for Revival and Mill Development Plan works, which were completed in August 2022 and the Company commenced production from September 2022.

2.1.2 Revival and Mill Development Plan

Revival of NEPA Limited was aimed at operation on a sustainable profit basis, to bring the Company out of the purview of the BIFR and turn its net worth positive after revival. It was envisaged to strategically disinvest the Company after its revival. As per approval (September 2012) of the Cabinet Committee on Economic Affairs (CCEA) to the revival package of the Company, the decision of the CCEA would be communicated to BIFR immediately, and once the Company was out of the purview of BIFR, the implementation of Revival and Mill Development Plan would be completed within 24 months. The Revival and Mill Development Plan had following components:

- Installation of two new De-Inking Plants (175 tonnes per day and 100 tonnes per day) which was subsequently changed to one De-Inking Plant with increased capacity of 300 tonnes per day;
- Up-gradation of existing Paper Machines viz., Paper Machine-1 and 2;

- Installation of new 8 Megawatt (MW) plant which was subsequently dropped in favour of cheaper option of renovation of existing 132 kilo volt (KV) sub-station to source power through grid; and
- Refurbishment/up-gradation of existing captive power unit (commissioned in 1989) of 12.27 MW.

The Department of Heavy Industry, while intimating the sanction of revised cost, directed (October 2018) that the balance works of Revival and Mill Development Plan should be completed within 12 months from release of the first instalment of funds. First instalment of additional funds was released in December 2018 and hence, Revival and Mill Development Plan works were to be completed by December 2019. The Company, however, completed the Revival and Mill Development Plan works only in August 2022 and commenced production in September 2022.

The implementation of Revival and Mill Development Plan works got delayed due to the following reasons:

- The entire equity contribution of ₹157 crore was released by the GoI between March 2014 and February 2016 but loan from consortium of banks could not be arranged by the Company which resulted in cost escalation of ₹149 crore (original sanctioned cost of ₹285 crore revised to ₹434 crore).
- BIFR's sanction to the Revival and Mill Development Plan was obtained in March 2014 i.e., after 18 months of Government sanction, and Environment clearance was received in January 2016 i.e., after 22 months of BIFR sanction.
- Increase in the scope of work due to defects/deteriorated condition of internal parts of the machines which was noticed only after the dismantling of machines and setting up of a new Effluent Treatment Plant, online pollution monitoring system etc., due to regulatory norms.
- Delay in processing of tenders due to backing out of some of the established brands/multinational companies at the time of final bidding due to disagreements over contract clauses.

2.1.3 Financial Status and Production Performance

The financial status and production performance of the Company during the period 2012-13 to 2016-17 (i.e., the year in which work on the Revival and Mill Development Plan were started after discontinuance of production in July 2016) is given below:

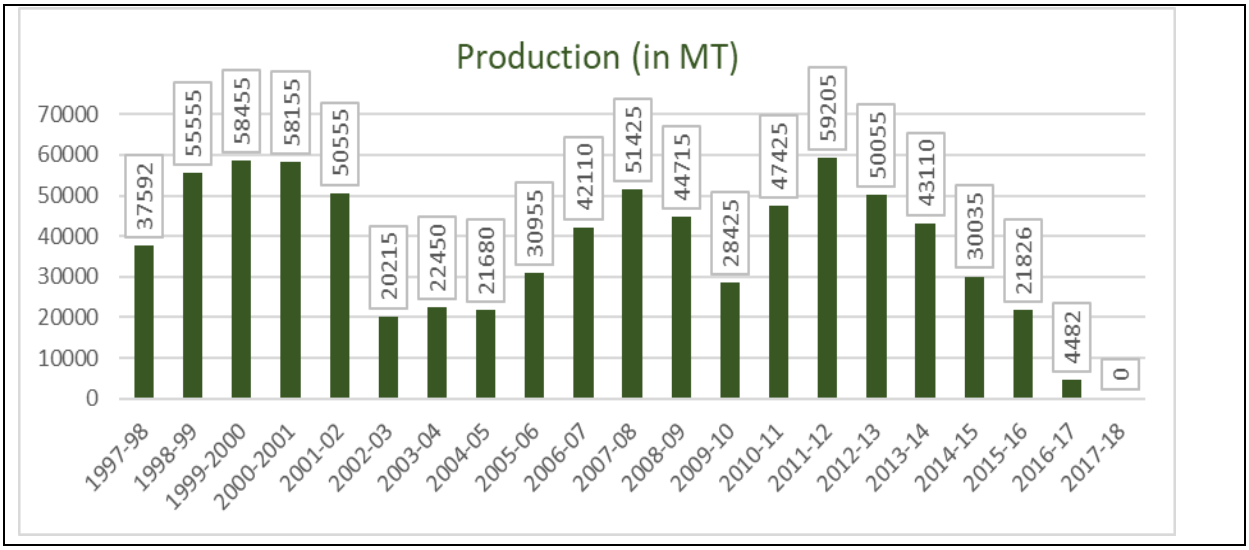
Table 2.1: Financial performance of NEPA for five years up to 2016-17

(₹ in crore)

Particulars	2012-13	2013-14	2014-15	2015-16	2016-17
Share Capital	107.86	107.86	107.86	502.98	584.71
Reserve & surplus	(-) 755.54	(-) 446.68	(-) 495.39	(-) 565.51	(-) 634.13
Borrowings	636.87	64.97	71.78	80.55	96.48
Net worth	(-) 587.68	(-) 16.33	(-) 15.04	18.72	(-) 49.41
Revenue from operations	141.40	131.19	102.12	70.99	30.31
Net profit/ loss	(-) 84.08	308.86	(-) 48.71	(-) 70.12	(-) 68.62
Accumulated Losses	755.65	446.79	495.50	565.62	634.23
Production (metric tonnes)	50,055	43,110	30,035	21,826	4,482

The Company never achieved its installed production capacity of 88,000 tonnes per annum. The production consistently decreased from the year 2012-13 and reached an all-time low of 4,482 metric tonnes during 2016-17. The production in the Company during 1997-98 to 2017-18 is given in the following chart:

Chart 2.3: Production in NEPA Ltd during the period 1997-98 to 2017-18



2.1.4 Audit Objectives

Audit was conducted to assess:

- Whether the formulation of Revival and Mill Development Plan and its implementation addressed the shortcomings identified in the revival package, and
- Whether activities of Revival and Mill Development Plan were carried out in compliance with the prescribed rules, established procedures and cannons of financial prudence.

2.1.5 Scope of Audit

Audit was conducted during 26 November 2021 to 4 February 2022 with a view to assess the achievement of objectives of the Revival and Mill Development Plan by the Company during the years 2012-13 to 2021-22 (up to December 2021).

2.1.6 Audit Criteria

Audit criteria were derived from the following:

- Detailed project analysis and Techno-economic feasibility study.
- Minutes of the meetings of the Board of Directors.
- Proceedings and awards/orders of the Board for Industrial and Financial Reconstruction.
- Guidelines/directives/orders issued by the administrative department and/or Department of Public Enterprises, Ministry of Environment, Forest and Climate Change, and State Pollution Control Board/National Green Tribunal.

- Provisions of the Export Promotion Capital Goods Scheme.
- Terms and conditions of the contracts/agreements/work orders/supply orders.
- Guidelines of Central Vigilance Commission on procurement of goods and services.

2.1.7 Audit Methodology

The audit methodology adopted was as follows:

- Entry Conference with the Management was held on 26 November 2021 to discuss the objectives and scope of audit.
- Examination of records relating to implementation of Revival and Mill Development Plan works as available in the Corporate office of the Company.
- Exit Conference with the Management was held on 4 February 2022 to discuss audit findings.

2.1.8 Sampling for Audit

As per information and work orders furnished to Audit, the Company executed 109 contracts/work orders valuing ₹404.03 crore during 2012-13 to 2021-22 for carrying out the Revival and Mill Development Plan works. Of these, 29 contracts/work orders valuing ₹329.63 crore (81.59 *per cent*) were selected for review on the basis of stratified random sampling using Interactive Data Extraction and Analysis (IDEA) Software. Details of the selected projects are given in **Annexure-III.**

2.2 Audit Findings

2.2.1 Appointment of Project Management Consultant

NEPA Limited floated a global tender (March 2013) for Project Management Consultant services for Revival and Mill Development Plan works in which three bids were received. Only one bidder i.e., Tata Consulting Engineers Limited was qualified on the basis of pre-qualification criteria. The Company appointed (October 2013) Tata Consulting Engineers Limited as the Project Management Consultant at a cost of ₹5.75 crore (excluding taxes) initially for a term of 24 months from the date of Letter of Intent i.e., 12 June 2013. The contract term was extended five times with the last extension up to 31 August 2021 (approved on 31 March 2021). No details of further extension of the Project Management consultancy contract beyond 31 August 2021 were available on record. The cost of consultancy was also increased to ₹7.99 crore exclusive of taxes against which payment of ₹5.01 crore had been made to the Project Management Consultant till March 2021.

In this regard, Audit observed the following:

2.2.1.1 Non-ensuring the availability of technical partner with Project Management Consultant till completion of project

As per clause 2.2 of the tender document for appointment of Project Management Consultant, the bidder could engage alliance partner for any one or two or for all the process packages/or

the civil construction package according to its requirement. Clause 2.4 of the tender document stipulated that the bidder and his alliance partner(s) should jointly fulfil all the pre-qualification criteria. Further, clause 2.5 stipulated that the bidder and alliance partner(s), if any, would ensure to continue to work till completion of the project.

On the basis of technical evaluation, Tata Consulting Engineers Limited was declared as qualified[29] based on its own experience together with the experience of its alliance partner *viz.*, A.F. Incepal, Spain. Although, Tata Consulting Engineers Limited was not a renowned consultant engaged in Project Management consultancy services in the field of Pulp and Paper Industry, its alliance partner was engaged in such services in the field. Audit, however, observed that A.F. Incepal did not continue the work towards Revival and Mill Development Plan activities beyond January 2016 and Tata Consulting Engineers did not engage any other technically competent firm in place of A.F. Incepal. This resulted in non-compliance to clause 2.5 of the tender document as Tata Consulting Engineers failed to ensure the availability of its alliance partner till the conclusion of the project.

The Management stated (March 2022) that Tata Consulting Engineer's alliance partner was involved in the conceptualisation of the De-Inking Plant and in Engineering Services as their designing team expert which had already been mostly finalised by the end of 2015.

The reply is not tenable as discontinuation of work by the alliance partner before completion of the project was in violation of terms and conditions of the tender document and it consequently led to delay in finalisation and award of tenders/work contracts for Revival and Mill Development Plan activities.

Thus, non-ensuring the availability of its alliance partner by the Project Management Consultant adversely affected the implementation of Revival and Mill Development Plan activities as discussed in succeeding paragraphs.

2.2.1.2 Deficiencies in preparation of estimates and delay in technical evaluation

As per terms of the work order issued by NEPA Limited (October 2013) to Tata Consulting Engineers Limited, the scope of services shall be as per the tender document. Clause 4 of the tender document, *inter alia*, provided that all activities for the successful completion and commissioning of the project are deemed to be incorporated in the scope of services of the Project Management Consultant although not specifically mentioned in the tender documents.

Audit noticed that the Project Management Consultant did not prepare detailed estimates of works and bill of quantities properly and therefore, additional work/quantities were necessitated during actual execution of work. Substantial changes in scope of work necessitated during execution contributed to delays and additional expenditure of ₹20.79 crore as detailed in **Annexure-IV**. Also, fresh tender had to be called for in one case.

Audit also noticed that detailed and realistic estimates were not prepared before issue of tender in order to evaluate the authenticity and appropriateness of rate quoted by the bidders in respect of work pertaining to refurbishment of 12.27 MW Captive Power Plant, refurbishment of Paper Machines and procurement/supply and installation of De-Inking Plant through open tendering

[29] ***The other bidders were Development Consultant Pvt. Ltd., Kolkata and Signet Products Pvt. Ltd, Pune.***

process. The Project Management Consultant prepared one-page estimate instead of detailed and realistic estimates on the basis of analysis of prevalent market rates of respective items of works and supply. Consequently, the reasonability of rates for awarding of contract could not be verified in audit. Due to non-preparation of realistic estimates, substantial differences between estimated value (₹127.70 crore) and awarded value (₹213.46 crore) were noticed in the contracts as detailed in **Annexure-V**.

Further, in the absence of any timeframe for evaluation of techno-commercial bids, the Project Management Consultant took between 79 days and 689 days in techno-commercial evaluation of bids for six major tenders which had a cascading effect on evaluation of price bids and issue of Letters of Intent as detailed in **Annexure-VI.** This was mainly attributed to frequent changes in scope and specifications of work due to which bid validity of some of the bids had to be extended.

The Management, while confirming the audit observation regarding estimates, stated (March 2022) that Tata Consulting Engineers did not do conceptual engineering to make the budget estimate more realistic at the beginning and was fully dependent on vendor input for every procurement. Tata Consulting Engineers provided bills of quantities and estimates only after completion of detailed engineering from all vendors, which took lot of time to initiate procurement and it entailed cost increase too. Change of scope was due to detection of additional work during renovation/dismantling of plant and machinery.

The Ministry stated (December 2022) that the initial scope of work was based on the Techno Economic Feasibility Study conducted in the year 2010 and the bills of quantities and draft tender were made accordingly. However, change in the scope of work was necessitated as the plant was operating till the year 2016 which led to further wear and tear in the old plant. Technical evaluation is a time-consuming process particularly for an old plant and with decreased experienced manpower, the challenges compounded. Also, many observations of various statutory bodies at various phases added to the time taken.

The reply is to be viewed in the light of the fact that non-preparation of detailed and realistic estimates by the Project Management Consultant before issue of tender notice was the primary reason for subsequent changes in scope of work. Further, the reply regarding time taken in evaluation of technical bids is not acceptable as no timeframe had been prescribed for completion of technical evaluation.

Thus, non-preparation of detailed estimates for various works and undue time taken in evaluation of bids by the Project Management Consultant resulted in frequent changes in scope of work leading to cascading delays and cost overrun.

2.2.1.3 Ambiguous contract conditions leading to cost escalation

As per clause 3 of work order issued (October 2013) to the Project Management Consultant, NEPA Limited may consider granting limited extension of time for genuine reasons. However, no additional payment will be made for services provided after scheduled completion period of 24 months from the date of Letter of Intent (i.e., 12 June 2013). Further, clause 2.3 (d) of the agreement (March 2014) between the Company and the Project Management Consultant provided that the Consultant would ensure that they continued to work till completion of the

project. However, the methodology of arriving at the price implication of Project Management consultancy services rendered beyond the stipulated period of 24 months was not specifically mentioned anywhere in the agreement.

The Company, without amending clause 3 of the work order, approved various contract amendments through which time extensions beyond the scheduled completion date were granted with increased cost. The Project Management Consultant demanded cost escalation of ₹3.92 crore up to December 2019 which was rejected by the Company as the work of Revival and Mill Development Plan was delayed due to poor performance of the Consultant. Finally, the Company approved (August 2020) escalation of ₹1.13 crore. It was also decided that for any extension beyond December 2019, escalation at the rate of eight *per cent* per year on unbilled amount was to be paid to the Project Management Consultant. Accordingly, NEPA paid ₹0.58 crore up to January 2021.

The Management stated (March 2022) that the contract with Tata Consulting Engineers was extended as per the prevailing progress of the Revival and Mill Development Plan till the year 2017. As loan of ₹128 crore from financial institutions as per the originally sanctioned scheme could not be received due to various reasons, financial crunch occurred which resulted in the delay in implementation of the project and while remobilising Tata Consulting Engineers to the site after sanction of the revised scheme in 2018, escalation was accepted to resolve the dispute.

The Ministry stated (December 2022) that payment for escalation was made with the approval of the Board of Directors. It further added that NEPA was constrained to accede to escalation due to non-availability of funds.

The replies of the Management and the Ministry did not address the audit observation on absence of a clause in the agreement, defining the methodology for arriving at the price implication of Project Management consultancy services rendered beyond the stipulated completion period of 24 months.

2.2.1.4 Inadequate monitoring of Revival and Mill Development Plan works by Project Management Consultant

As per Annexure-III to the consultancy agreement, the Project Management Consultant was required to establish the project time control procedures and detailed project planning, scheduling and monitoring systems and evaluate the progress of work there against. The Project Management Consultant was also required to monitor the day-to-day progress of the Revival and Mill Development Plan project and remove any bottleneck, if required.

Audit observed that:

- The Project Management Consultant neither prepared activity-wise schedule of implementation of various activities of Revival and Mill Development Plan nor prepared Programme Evaluation and Review Technique chart.
- The Project Management Consultant did not adopt Critical Path Method to prioritise different Revival and Mill Development Plan activities for timely and uninterrupted completion of project and did not prepare and present work process chart despite

direction by the Chairman of the Monitoring Committee in its meeting dated 26 July 2019.

- The Project Management Consultant changed the project manager of consultancy work frequently and it did not provide sufficient skilled work force at the site on continuous basis as envisaged in the consultancy agreement. The Consultant also did not inform the aforesaid changes to the Company.
- The Project Management Consultant did not submit weekly progress reports to the Technical Committee despite repeated instructions in the meetings of the Monitoring Committee.

The Management, without submitting specific reply, stated (March 2022) that Tata Consulting Engineers submitted monthly progress review reports and weekly progress reports with project schedule monitoring.

The Management's reply is to be viewed in the light of the fact that the weekly/monthly progress reports along with project schedule monitoring were neither available in records nor provided to Audit.

The Ministry stated (December 2022) that the site office of the Project Management Consultant included experienced personnel in all specialised engineering fields. While major or contentious issues were referred to the Head Office at Mumbai, day to day issues were resolved at the site. While the Project Management Consultant could have done a better job, non-availability of funds for nearly two years and two phases of Covid-19 accentuated delays in the project.

The reply is to be viewed in the light of the fact that almost entire activities were managed by the Project Management Consultant from its Mumbai office and the issues arising at the work site were resolved through email and Skype meetings which is evident from the specific records of the Company. Quality in consultancy contracts is largely dependent upon deployment and performance of key personnel during execution of the contract. Besides, the reply was silent regarding non-preparation of Programme Evaluation and Review Technique Chart, non-adoption of Critical Path Method and non-submission of weekly/monthly progress reports.

Recommendation 1:The Ministry may strengthen the mechanism for monitoring the activities of the Project Management Consultant and for due performance by him in future assignments.

2.2.2 Award and execution of works

2.2.2.1 Acceptance of invalid bid and undue favour to contractor

NEPA Limited awarded (July 2015) different works[30] for renovation of both Paper Machines on lump sum basis to PAPCEL (a body incorporated in Czech Republic) at a cost of ₹103.82

[30] ***Refurbishment/modification of Stock preparation, Approach Flow, Broke Handling System, Fibre Recovery, Paper Machines with Auxiliaries excluding civil works.***

crore (€60,21,545 for imported supplies[31] *plus* ₹61.10 crore for indigenous supplies and services) after inviting global tender.

Audit observed that:

- The bid on the basis of which the contract was awarded to PAPCEL was in fact submitted by another company i.e., Papcel Technology (I) Pvt. Limited. Mr. V. Gokulakrishnan, a director in Papcel Technology (I) Pvt. Limited (who was also a Director in PAPCEL) had signed the price bid by putting common seal[32] of Papcel Technology (I) Pvt. Limited.
- Although the Managing Director of PAPCEL authorised (23 September 2014) Mr. V. Gokulakrishnan to sign and submit the tender referring to the power of attorney dated 29 September 2014 granted in his favour by PAPCEL but the said power of attorney was neither available in records nor formed part of the agreement executed with PAPCEL. Moreover, the bid was not submitted by Mr. V. Gokulakrishnan as a representative of PAPCEL but as a director of Papcel Technology (I) Pvt. Limited.
- The bid was liable to be rejected but the Project Management Consultant responsible for evaluation of bids, did not consider this aspect and recommended (March 2015) to open the price bid submitted by Papcel Technology (I) Pvt. Limited which was the only bid found technically qualified among two bidders.
- For any valid contract, there should be a proposal, acceptance and consideration. In this case, the proposal was given by Papcel Technology (I) Pvt. Limited but the agreement was executed with PAPCEL and as such the contract cannot be said to be enforceable. Offer (bid) against the Notice Inviting Tender issued by NEPA Limited was submitted by Papcel Technology (I) Pvt. Limited (an entity distinct from PAPCEL) but the contract/agreement was executed with PAPCEL which never made an offer to NEPA Limited. As such, contract agreement executed between PAPCEL and NEPA was not enforceable in law.
- Due to disputes regarding payment related issues, PAPCEL demobilised its resources from the site during the period May 2017 to April 2019. For resolving the matter, NEPA Limited was bound to accept all deviations proposed by PAPCEL during currency of the contract for renovation works of both the Paper Machines, valuing ₹ 5.54 crore[33].

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[31] ***Converted to ₹42.72 crore @ 70.9378 prevalent on 30 June 2015.***

[32] ***Common seal means the official seal of a Company which can be affixed only with the approval of the Board of Directors of the Company. It is the signature of the Company having separate legal entity in terms of jurisprudence.***

[33] ***EURO 2,22,564 equivalent to ₹186.06 lakh (converted at the prevailing exchange rate: 1 EURO: ₹83.60 as on 28 January 2022) and ₹368.38 lakh.***

- There was undue favour to PAPCEL as they completed engineering work on 01 April 2017 with a delay of 54 weeks but liquidated damages of €9,519.50 plus ₹12.60 lakh were not levied[34] resulting in non-compliance of Clause 9(1) of the agreement[35].

The Management stated (March 2022) that the Managing Director of PAPCEL had authorised (23 September 2014) Mr. V. Gokulakrishnan, along with two other executives of the company to sign and submit the proposal/tender in respect of the captioned job and also to sign and submit all the papers/documents as may be necessary in this regard in terms of power of attorney dated 29 September 2014 granted in his favour by PAPCEL. It further stated that liquidated damages on account of delay in completion of engineering services was not levied on the advice of the Project Management Consultant who opined that the liquidated damages clause was on overall contract completion of vendor and an amount of ₹3.42 crore was withheld by way of deduction from various bills of the contractor as on 31 January 2022 for the purpose.

The Ministry stated (December 2022) that copies of requisite authorisation letter by PAPCEL (verified through a letter by the Chairman cum Managing Director, NEPA Limited from Czech Ambassador, India and their concurrence obtained) for Mr. V. Gokulakrishnan, to sign and submit the proposal/tender in respect of the captioned jobs and also to sign and submit all the papers/documents as may be necessary including the agreement were handed over to Audit. It further added that liquidated damages will be imposed on PAPCEL at the time of final payment and 10 *per cent* amount is withheld.

The replies of the Management and the Ministry are not tenable as Mr. V. Gokulakrishnan submitted the bid in the capacity of director of Papcel Technology (I) Pvt. Limited not as a representative of PAPCEL. Besides, power of attorney dated 29 September 2014 was neither available in records nor formed part of the agreement executed with PAPCEL. It is also worth mentioning that the date of authorisation letter was 23 September 2014 and it referred to the power of attorney executed at a subsequent date viz., 29 September 2014. Further, liquidated damages should have been deducted from the bills of contractors as per terms of the contract and the amount withheld as retention money would be payable to contractor on successful completion of entire work and would not be subject to adjustment on account of liquidated damages.

Thus, award of contract to PAPCEL on the basis of bid which was not submitted by it was against the basic premise of tendering and frequent disruption in work by PAPCEL resulted in cost escalation.

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[34] ***Calculated at the rate of 5 per cent of engineering services in respect of imported items (€1,90,390) and indigenous items (₹252.00 lakh).***

[35] ***If contractor fails to provide engineering services within agreed completion dates, the purchaser may deduct from the contract price as liquidated damages, a sum equivalent to 0.5 per cent of engineering fee for each week of delay until the completion of engineering services, subject to a maximum of 5 per cent of the total engineering fees.***

2.2.2.2 Irregular award of additional civil works

NEPA Limited awarded (18 September 2015) civil and structural works for construction of 300 Bone Dry[36] Tonne Per Day De-Inking Plant, Raw Material Storage Building and modification works for Paper Machine-1 & 2 to Capital Construction Private Limited at a cost of ₹12.06 crore including service tax of ₹63.97 lakh. As per the work order, entire work was to be completed within a period of 10 months to be reckoned from the 14th day of issue of work order or handing over of the site, whichever was later. Thus, work was to be completed by July 2016 i.e., 10 months reckoned from 14th day of issue of work order but the work could not be completed within scheduled completion time and the Company granted various time extensions through amendments in the contract. Last extension was up to 31 August 2021.

The contract value was also increased by 97.60 *per cent* of original total awarded cost (₹23.83 crore from ₹12.06 crore) and 80.56 *per cent* of original total awarded cost excluding taxes (₹20.62 crore from ₹11.42 crore). There were huge variations in quantity during actual execution but instead of assessing the expected quantity of works and revising the bill of quantities, the Company kept approving the cost escalation and revised bill of quantities was not prepared as of March 2022. The escalation was mainly due to:

- Introduction of Goods and Services Tax; tax impact on unbilled portion increased by ₹14.02 lakh
- Increase in rates for excavation due to hard rock: ₹33.72 lakh
- Additional civil works: ₹9.96 crore

Audit observed that:

- As per clause 7.7 of the contract, variation of (+/-) 15 *per cent* was admissible but in contravention, the Company approved additional work entailing additional cost to the extent of 80.56 *per cent* of original awarded cost.
- Soil investigation studies was in the scope of work of the Project Management Consultant. However, it did not conduct the soil investigation properly due to which additional expenditure of ₹33.72 lakh had to be incurred due to hard rock found during execution. The reasonability of additional expenditure towards hard rock excavation could not be ensured as there were no competitive rates available.
- The details of additional civil work have not been provided due to which Audit could not comment on justification/requirement of additional works.

[36] ***Bone-dry denotes moisture free.***

Figure 2.1: Civil works

The Management stated (March 2022) that additional work was awarded to contractor in accordance with the Company's policy stating that repeat order shall be placed on the party on the same rate and terms and conditions for 50 *per cent* quantity of the original tender quantity and policy of Bharat Heavy Electricals Limited stating that total increase in quantity through amendments or repeat orders should not exceed two times (200 *per cent*) of the originally ordered quantity with due approval of Board of Directors.

The Ministry stated (December 2022) that the initial scope of work was drawn up based on the initial report of 2010 and with the project execution commencing from July 2016, there was an increase in the scope being an old plant and a brown field project. Therefore, based on the growth of work, additional 50 *per cent* of the contract amount was approved by the Board as per existing financial regulations of the Company in order to complete the work without any further disruption. Another additional 50 *per cent* was envisaged with the progress of work (keeping in view of Covid pandemic situation resulting in restriction on availability of labour) and the case was forwarded in December 2020 and approved by the next higher authorities, i.e., Ministry of Heavy Industries.

The replies of the Management and the Ministry are not tenable as neither the existing financial regulations of the Company nor the General Financial Rules permit awarding of additional quantity of work to an existing contractor to the extent of 100 *per cent* of original awarded quantities. Besides, repeat order is an order placed again by a customer for a product or service they have ordered before. In this case, there was additional quantity of works and this was not a repeat order.

Thus, award of additional civil works was in violation of tender conditions as well as the Company's own policy for procurement.

2.2.3 Avoidable cost escalation

Out of total 29 contracts costing ₹329.63 crore selected in audit, three contracts costing ₹186.30 crore, *inter-alia,* included supply of imported plant and machineries attracting customs duty. Customs duty was a part of basic price wherever basic price was explicitly mentioned.

Under the contract[37] for refurbishment of existing Rewinder for Paper Machine-1 and new Rewinder for Paper Machine-2 awarded to PAPCEL, advance payment equal to 10 *per cent* of the total basic price (₹22.93 crore including customs duty on imported part of delivery) was to be paid upon signing of the contract against submission of advance bank guarantee.

The contractor (PAPCEL) submitted (December 2016) advance bank guarantee equal to 10 *per cent* of the total basic price and asked for advance payment of ₹2.29 crore as per terms of the contract. But the Company released advance payment of ₹2.02 crore only after deducting the import duty. The contractor did not agree to this and stated that they were not willing to work on the project until balance advance payment was released. The deadlock situation remained for a period of more than 27 months[38]. The Company finally agreed to release the balance amount but the contractor demanded additional amount of ₹1.50 crore on account of price escalation against which the Company agreed (February 2019) to pay ₹0.90 crore.

Thus, non-releasing of advance payment as per terms of agreement resulted in avoidable escalation of ₹0.90 crore.

The Management stated (March 2022) that there were severe fund constraints with the Company due to which only 10 *per cent* of the basic value was paid to the vendor and balance 10 *per cent* was paid when the funds resumed later.

The Ministry stated (December 2022) that the Company had to pay 10 *per cent* of ₹2,293.23 lakh i.e., ₹229.30 lakh to PAPCEL as advance as per the contract post payment of advance bank guarantee by the contractor. The Company was constrained to restrict the advance payment to ₹202 lakh in March 2017 as the Project Account had no further funds available which had been verified from the accounts. It was further added that as per the directives of the Department of Heavy Industry, the complete project was kept on hold due to fund constraint until the receipt of clearance from the Cabinet for the additional fund. Therefore, the time delay or logjam was not on account of the reason as per the audit observation but because the Company was waiting for the Project Fund to be sanctioned.

The reply is not tenable as the Company had cash and cash equivalents of ₹204.61 lakh as on 31 March 2017 and ₹87.76 lakh as on 31 March 2018 as per its audited financial statements. Besides, the approval regarding release of advance payment clearly showed that advance payment was released after deducting import duties whereas the same was to be released on contract price including import duties.

Thus, injudicious decision to release the advance amount excluding import duty led to dispute with the contractor resulting in subsequent delay and cost escalation.

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[37] ***No. PROJ/908/2016 dated 31 August 2016.***

[38] ***Calculated from the date of effectiveness of initial contract (29 November 2016) to the date of effectiveness of amended contract (01 March 2019)***

2.2.4 Construction of ash pond of inadequate capacity

The Company initially estimated (October 2016) construction of an ash pond on 18 acres area of land to cater the need of dumping ash generated by its Captive Power Plant over a period of five years. The area of ash pond was revised (September 2017) by the Project Department to nine acres (tentative cost of ₹15 crore) which could accommodate ash generated over a period of two years. However, the Civil Department estimated the cost of ₹6 crore which was not considered reliable by the Project Department.

The Company invited (October 2017) Expression of Interest for construction of ash pond wherein Indo Engineering Project Corporate Pvt. Ltd. proposed to construct an ash pond to store 56,000 metric tonnes of ash generated during one year of operation of Captive Power Plant at a cost of ₹6.30 crore. Considering this, the Company further reduced the area of ash pond to 4.5 acres of land to accommodate ash to be generated (56,000 metric tonnes) in one year of operation of Captive Power Plant.

Subsequently, the Company invited (May 2019) tender for construction of ash pond and awarded (September 2019) the work of construction of ash pond on 4.5 acres of land to Neelkantham Systems Pvt. Ltd. at a cost of ₹6.45 crore. As per the agreement, the work was to be completed within six months from the date of Letter of Intent (30 August 2019). The work was not completed within scheduled time and six time-extensions were granted with the last extension up to 31 December 2021. The work was under progress and a payment of ₹5.52 crore had been made to the contractor until 31 December 2021.

Audit observed that construction of lower capacity ash pond would result in overflow which would not only damage the environment and may invite action from environmental authorities but would also draw penalty charges. This could also lead to stalling of the Company's activities of manufacturing of paper.

Figure 2.2: Ash Pond

The Management stated (March 2022) that ash pond was constructed on 4.5 acres of land to cater the need of storage of ash generated in one year considering the disinvestment process and budget restriction at that time to fulfil the Pollution Control Board norms for 12.27 MW Captive

Power Plant. After start-up of the plant and generation of revenue, remaining ash pond would be constructed in next phase as per the requirement in future.

The Ministry reiterated (December 2022) the facts stated in the reply of the Management.

The replies of the Management and the Ministry indicate an ad-hoc approach towards works as the Company only requested (November 2017) funds of ₹6 crore from the Ministry towards cost of constructing the ash pond on 4.5 acres of land instead of constructing the ash pond on nine acres of land. Besides, cost of construction of higher capacity ash pond is always much lower than additional cost of construction of new ash pond at different place than the existing one.

Thus, construction of ash pond on lesser area of land by the Company was made without applying due diligence.

2.2.5 Undue favour to contractors

In respect of three contracts, the contractors were extended undue favour and benefits in several forms in violation of the terms and conditions of the contract agreements, prevalent statute and rules and regulations as detailed below:

a) NEPA awarded a contract for Sludge Handling System and Effluent Treatment Plant to Arvind Envisol Limited at a value of ₹22.47 crore. As per contract, the work was to be completed by 26 October 2019 i.e., within eight months from date of issue of Letter of Intent (26 February 2019). The contractor was to submit performance security for an amount equal to 10 *per cent* of the total value of ₹22.47 crore of the contract within seven days from the date of Letter of Intent as per clause 19.6 of the terms and conditions of the tender.

Audit noticed that time extensions up to 31 August 2021 were provided to contractor through nine contract amendments. However, the contractor was allowed to work at site beyond August 2021 without further extension of time. Liquidated damages at the prescribed rate as per contract terms were also not imposed on account of delay in completion of work. Besides, the contractor was also allowed to submit bank guarantee on 8 May 2019 with a delay of more than two months.

The Management stated (March 2022) that contractor was allowed to continue the work at site even after scheduled date of completion as per extension of time due to Covid-19 pandemic.

The reply was, however, silent in respect of relaxation in submission of bank guarantee and non-deduction of liquidated damages contrary to the terms and conditions of the contract.

b) In the contract for Pre-Engineered Building work for De-Inking Plant and Raw Material Storage awarded to M/s Everest, the contractor was allowed to submit general arrangement design documents after six months against the requirement of furnishing the same within 1.5 months which consequently delayed other activities under the contract. Further, the contractor was allowed 13 time-extensions and price escalation of ₹23.60 lakh (including taxes) although there was no such provision in the contract.

The Management, while confirming the facts, stated (March 2022) that liquidated damages were not imposed as delay was attributable to the Project Management Consultant and the

Company and escalation was paid as per clause 10 CC of the Central Public Works Department Manual.

The reply is not tenable as contractor submitted general arrangement design documents after six months instead of within 1.5 months, which consequently delayed other activities under the contract, and thus delay was attributable to the contractor. Moreover, escalation should have been regulated as per contract terms.

In respect of points (a) and (b) above, the Ministry stated (December 2022) that the Company had not shown any undue favour and would impose liquidated damages on all contractors who had not adhered to the contractual obligations in their final billing. It is pertinent to mention that 10 *per cent* of amount of the defaulted firms had been withheld to ensure that liquidated damages were levied. It was further stated that the procurement guidelines of the Company had been revisited as per various guidelines and as advised by the Audit.

The reply is not tenable as 10 *per cent* was withheld on account of performance security which would be paid subsequently to the contractors after successful completion of contractual obligations and shall not be subject to adjustment against liquidated damages. The liquidated damages were governed by a separate clause {clause 19.23 of tender in respect of (a) above and clause 2 of tender in respect of (b) above}and therefore the same were required to be levied as per the terms and conditions of the contracts.

c) In the contract for new De-Inking Plant awarded to M/s Andritz, NEPA allowed waiver in respect of quality inspection in violation of shop inspection and test clause[39]. Further, bank guarantee was not renewed timely and venue of arbitration was changed from Bhopal to Singapore in deviation from tender conditions.

The Management stated (March 2022) that waiver was not given to any main equipment except for some small parts the performance of which would be assessed only after installation.

The reply of the Management was silent on the change of venue of arbitration and non- renewal of bank guarantee timely.

The Ministry did not furnish any reply for the above issue.

Thus, undue favour to contractors were allowed in the form of time relaxation in submission of bank guarantee/security deposit, non-imposition of liquidated damages, cost escalation, etc.

Recommendation 2: The Company may develop a mechanism for enforcing procurement guidelines and contractual terms and conditions for effective works management.

[39] ***This clause entailed that the vendor shall provide all services to establish and maintain quality of workmanship in his works and plant and equipment to be supplied under the contract shall be subject to inspection and testing.***

2.3 Other Audit findings

2.3.1 Failure to fulfil export obligations under Export Promotion Capital Goods Scheme

The Techno-Economic Viability Study, based on which revised cost of Revival and Mill Development Plan (₹434 crore) was approved by the Cabinet Committee on Economic Affairs in October 2018, envisaged a waiver of customs duties of ₹33.09 crore under Export Promotion Capital Goods Scheme[40] while arriving at the projected cost of Revival and Mill Development Plan against which export obligations of ₹198.54 crore were to be met by supplying the final product (viz., Newsprint and Writing & Printing Paper) to the neighbouring countries like Sri Lanka, Afghanistan and others. GoI, while according its approval to the revised cost of Revival and Mill Development Plan viz., ₹434 crore, also considered Export Promotion Capital Goods benefits of ₹24 crore.

Export Promotion Capital Goods Scheme allows import of capital goods (except those specified in negative list in Appendix 5F[41]) for pre-production, production and post-production at zero customs duty. Import under Export Promotion Capital Goods Scheme shall be subject to an export obligation equivalent to six times of duties, taxes and cess saved on capital goods to be fulfilled in six years reckoned from date of issue of Export Promotion Capital Goods authorisation. As per clause 5.01 (c) of the Export Promotion Capital Goods Scheme, authorisation shall be valid for import for 18 months from the date of its issue.

As per the prescribed[42] procedure, 50 *per cent* of export obligation was to be fulfilled in block of first four years and the balance during next two years (5th and 6th year). Where the export obligation of the first block is not fulfilled and extension was not provided by the Regional Authority, the Authorisation holder shall, within three months from the expiry of the block, pay duties of customs (along with applicable interest as notified by the Department of Revenue) proportionate to duty saved amount on total unfulfilled export obligation of the first block.

NEPA Limited obtained eight zero duty Export Promotion Capital Goods authorisations from Regional Licensing Authority to avail Export Promotion Capital Goods benefits in form of zero customs duty. Out of these, the Company imported Plant and machineries (De-Inking Plant, parts of Paper Machines, Chemical Handling & Processing Plant and Reel Wrapping Machine) in respect of four Export Promotion Capital Goods authorisations. Export obligation in respect of one authorisation[43] had not arisen at the end of year 2021 although Reel Wrapping Machine had been imported and customs duty was saved as per provisions of Foreign Trade Policy. For balance three authorisations, fulfilment of block-wise export obligation by the Company was to be done as per details given below:

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[40] ***Chapter-5 of Foreign Trade Policy 2015-20.***

[41] ***Appendix-5F of the Foreign Trade Policy contains the list of goods not permitted/permitted for import subject to specific conditions under the Export Promotion Capital Goods Scheme.***

[42] ***Clause 5.14 of Handbook of Procedures.***

[43] ***No. 0530174037 dated 5 March 2019.***

Table 2.2: Block-wise fulfilment of Export Obligation by NEPA Limited

(₹ in crore)

Sl. No.	Export Promotion Capital Goods Authorisation Number	Item Imported	Date of Authorisation	Total Export Obligation	Duty saved	Date of fulfilment of Export Obligation in first Block	Export Obligation to be fulfilled in the block of first four years
1	0330043570	De-Inking Plant	27.01.2016	70.83	11.81	26.01.2020	35.42
2	0530168243	Parts of Paper Machines	03.08.2016	62.33	10.39	02.08.2020	31.17
3	0330046712	Chemical Handling and Processing Plant	21.03.2017	5.73	0.96	20.03.2021	2.87
	Total			**138.89**	**23.16**		**69.46**

Audit observed that the Company failed to fulfil the export obligation of ₹69.46 crore in the block of first four years due to which it was required to pay customs duty of ₹11.57 crore (50 *per cent* of total duty saved) along with interest of ₹3.44 crore (at the applicable rate of 18 *per cent* per annum up to December 2021). NEPA sought extension in the export obligation period in respect of one export obligation[44] belatedly (August 2020) but no extension was sought for other two export obligations.

Keeping in view the inordinate delay in completion of Revival and Mill Development Plan works and consequential delay in commencement of production of Writing and Printing Paper and Newsprint Paper, chances of fulfilling the export obligation was remote even within the total extended period[45] of eight years (including one extension of up to two years, if allowed) and ultimately entire customs duty of ₹23.16 crore would have to be paid along with applicable interest.

The Management, while accepting the facts, stated (March 2022) that it was dedicated towards the export obligation and was working towards the completion of Revival and Mill Development Plan with a positive approach.

The Ministry while accepting the facts stated (December 2022) that a case has been taken up with the Director General of Foreign Trade to extend the period from six years to the maximum as per laid down regulations. The Company was confident of meeting the target in next two years based on the prevailing Paper market scenario. Customers from various countries had already approached the Company with enquiries.

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[44] ***Authorisation No. 0330043570.***

[45] ***As per clause 5.01 (c) read with clause 5.17 (b) of EPCG Scheme.***

The fact remains that 50 *per cent* of the export obligation for the block of first four years had already expired in March 2021 and extension from Director General of Foreign Trade was still awaited.

Thus, due to delay in completion of Revival and Mill Development Plan works, the Company could not complete the export obligation and therefore lost opportunity to save import duty amounting to ₹23.16 crore.

2.3.2 Avoidable payment of delayed payment surcharge on electricity bills

NEPA Limited had a sanctioned load of 1.25 Mega Volt Ampere (MVA) on 132 kV supply voltage for which it was required to make payment of electricity bills on monthly basis on specified due date failing which delayed payment surcharge at the rate of 1.25 *per cent* per month or part thereof on the amount outstanding including arrears was payable.

Audit noticed that the Company defaulted in making payment of electricity bills from February 2018 to October 2019 and again from April 2020 to October 2020 for which it had to pay delayed payment surcharge of ₹58.52 lakh.

The Management stated (March 2022) that electricity dues could not be paid due to non-availability of fund with NEPA and due to non-availability of sanctioned head it was not possible to process the payment of electricity bill from project fund and bills were paid when the funds were available.

Further to the reply of the Management, the Ministry stated (December 2022) that effort was made by the Company with a request for waiving off the accumulated surcharge of ₹43.55 lakh to Madhya Pradesh Paschim Kshetra Vidyut Vitran Company Limited which was not acceded to by them.

The reply is to be viewed in the light of the fact that the Company did not approach the Department of Heavy Industry proactively for timely release of funds for making payment for the committed expenses on electricity.

2.3.3 Avoidable payment of damages and interest on Employees' Provident Fund

NEPA Limited being an industrial establishment under Employees' Provident Fund & Miscellaneous Provision Act, 1952 (EPF Act) was required to remit/deposit employees and employer's contribution towards provident fund to Employees' Provident Fund Organisation timely as required under the provisions of EPF Act. Any delay in deposit of contribution invited penalty as damages not exceeding the amount of arrears under Section 14B of the Act, provided that the Central Board may reduce or waive the damages levied under this section in relation to an establishment which is a sick industrial company and in respect of which a scheme for rehabilitation has been sanctioned by the Board for Industrial and Financial Reconstruction. Besides, employer shall be liable to pay interest at the rate of 12 *per cent* per annum as prescribed by Section 7Q of the Act.

Audit noticed that Employees Provident Fund Organisation levied damages of ₹3.86 crore under Section 14B and interest of ₹1.89 crore under Section 7Q of the EPF Act, 1952 for default in remittance for the period from December 2014 to October 2017. The Company did not

deposit the penalty imposed within the stipulated time. As a result, bank accounts of the Company with the State Bank of India and the Bank of India were attached by Employees Provident Fund Organisation (November 2021) and a sum of ₹5.75 crore was withdrawn. The Company did not seek relief available under the Act for sick industrial company although the Board for Industrial and Financial Reconstruction had already sanctioned a rehabilitation scheme for the Company. It affected the implementation of Revival and Mill Development Plan and blocking of substantial funds along with consequential loss of interest thereupon.

The Management stated (March 2022) that NEPA was undergoing tough financial condition and was totally dependent on GoI for salary and wages support. Salary and wages dues were pending from GoI since April 2014 due to which NEPA was not able to pay Provident Fund dues on time. GoI was requested to extend financial support citing the pendency of Provident Fund dues. The Central Provident Fund Commissioner was also requested through the Administrative Ministry to consider the waiver of damages and interest charged from the Company.

The Ministry reiterated (December 2022) the facts stated by the Management in its reply.

The replies of the Management and the Ministry are to be viewed in the light of the fact that the Company failed to take up the matter of waiver of damages and interest timely and to seek relief in the capacity of a sick industrial company after sanction of rehabilitation plan by the Board for Industrial and Financial Reconstruction.

Thus, non-seeking of relief available to a sick industrial undertaking led to blocking of funds amounting to ₹5.75 crore.

Recommendation 3: Financial management may be strengthened so that statutory dues are paid on time to avoid punitive action.

2.4 Expected shortfall in producing envisaged quantity of Writing and Printing Paper

Revival and Mill Development Plan was aimed at product diversification by producing 46,800 tonnes per annum of Writing and Printing Paper and 36,200 tonnes per annum of Newsprint Paper with increased brightness of 57-60 degree[46] from existing 38-42 degree. Keeping in view the existing configuration of Paper Machines-1 & 2, production of Writing and Printing Paper was considered in Paper Machine-1 and production of Newsprint Paper was considered in Paper Machine-2, as Paper Machine-1 was capable to produce higher volume of paper as compared to Paper Machine-2. Since both Paper Machines were identified for producing different types of paper, two De-Inking Plants with capacities of 175 tonnes per day and 100 tonnes per day were proposed to be installed under the Revival and Mill Development Plan for Paper Machine-1 and Paper Machine-2 respectively. But in the revised cost, only one De-Inking Plant of 300 tonnes per day capacity was envisaged to be installed.

Audit noticed that a single De-Inking Plant was proposed in view of economy in the Revival and Mill Development Plan cost but the production effectiveness of a single De-Inking Plant

[46] ***The higher the degree, the higher will be the brightness of paper.***

was not considered. Through a single De-Inking Plant, production of only one type of paper (Newsprint Paper or Writing and Printing Paper) at a time would be possible and to manufacture another type of paper, stock preparation i.e., pulp making would have to be changed. Change of the process would not only result in idling of plant but higher input cost. Thus, the Company would not be able to achieve the envisaged objective of producing 46,800 tonnes per annum of Writing and Printing Paper.

Further, Writing and Printing category of paper includes papers of office stationery, textbooks, copier, notebooks etc. It was, however, noticed that the Paper Machines would be able to produce textbook and notebook paper only under Writing and Printing Paper category after renovation/refurbishment of the Paper Machines under Revival and Mill Development Plan which may impact their market presence. Necessary modifications in plant and machineries were also not considered for producing copier paper and office stationery during technical and economic feasibility study.

The Management stated (March 2022) that NEPA would produce Writing and Printing Paper on both the Paper Machines with the use of imported raw material and hence both the Paper Machines were capable to produce Writing and Printing Paper as well as Newsprint Paper. As per Techno-Economic Feasibility Report, only internal sizing was considered in Paper Machine and therefore the Company would be able to produce notebook and textbook paper only under the category of Writing and Printing Paper. For the photocopier paper and office stationery, external sizing is required and Size press would have to be installed in Paper Machine which was not considered due to the huge modification requirements and space constraints.

The Ministry stated (December 2022) that with the present condition of the plant, the Company was confident of achieving the desired target in the present configuration both for Writing and Printing Paper and Newsprint Paper. This was based on the trials and present rate of production.

The replies of the Management and the Ministry need to be viewed in light of the fact that the proposal to install only one De-Inking Plant was made without considering production effectiveness, idling of machines and higher input cost which may result in shortfall from envisaged production. Further, the envisaged objective of producing 46,800 tonnes per annum of Writing and Printing Paper might not be possible to achieve without producing photocopier paper and office stationery as these form a substantial part of the total demand of Writing and Printing Paper.

2.5 Monitoring and Supervision

2.5.1 Monitoring and Supervision by Department of Heavy Industry/NEPA

As per the approval (September 2012) of the Cabinet Committee on Economic Affairs, the progress of Revival and Mill Development Plan was to be monitored on a quarterly basis. As per Cabinet Committee on Economic Affairs approval (October 2018) of revised Revival and Mill Development Plan cost, a Committee under the chairmanship of Financial Advisor, Department of Heavy Industry was required to monitor the monthly progress of Revival and Mill Development Plan, especially with reference to time and cost. Further, NEPA Management was accountable for fulfilling the commitment of timely completion.

Audit observed that:

- The Department of Heavy Industry did not prescribe any formal monitoring and supervision mechanism to ensure timely completion of Revival and Mill Development Plan activities since its inception to September 2018.
- A Monitoring Committee was constituted (October 2018) under Additional Secretary cum Financial Advisor, Department of Heavy Industry to monitor the progress on monthly basis. The Committee held 23 meetings up to 25 November 2021 in which the focus was mainly on speeding up of tendering process and it did not make recommendations on sequencing of various activities to shorten the implementation process time.
- The Department of Heavy Industry directed (16 September 2016) for re-allocation of works of Deputy General Managers, making them in-charge of three major projects (Paper Machine, De-Inking Plant and Power Station) with direct reporting to the Chairman-cum-Managing Director to shorten the reporting channel and direct monitoring of project progress by the Chairman-cum-Managing Director. But in violation of these directions, the Deputy General Managers were reporting to General Managers as per routine reporting channel.

The Management stated (March 2022) that Tata Consulting Engineers was appointed as the Project Management Consultant for monitoring and controlling the day-to-day activities of Revival and Mill Development Plan. No committee was formed at the level of the Company to monitor the progress of Revival and Mill Development Plan financially. However, the existing tender committee was involved, to resolve any ongoing financial impact and cost escalation to have a proper control.

The reply is not tenable as no project monitoring committee was constituted at local management level. Merely, inclusion of monitoring of Revival and Mill Development Plan works in the scope of the Project Management Consultant does not relieve the local management from the responsibility of monitoring construction/erection/supplies activities.

The Ministry stated (December 2022) that monitoring of the work was duly assigned to individual nodal officers at various levels for each package. Deputy General Manager (Project) and General Manager (Works & Project) were specifically empowered to monitor the project activities. The delay was observed due to the various reasons beyond the control of NEPA Management. Further, monthly meetings of the Monitoring Committee were held by Ministry of Heavy Industries under the chairmanship of Special Secretary & Financial Advisor to review and monitor the project status.

The reply needs to be viewed in the light of the fact that Ministry's directions to the effect of re-allocation of works of the Deputy General Managers making them in-charge of three major projects and direct reporting to Chairman-cum-Managing Director was not adhered to by the Management.

Thus, non-monitoring of work on the part of the Company not only shows the lackadaisical approach of the Company but is one of the main reasons for delay in completion of Revival and Mill Development Plan works.

2.5.2 Insufficient skilled work force

As recommended by the Board for Reconstruction of Public Sector Enterprises, GoI accorded (September 2012 and October 2018) approval for introducing voluntary retirement scheme in respect of 800 employees at a cost of ₹150.83 crore to be released in the form of 7 *per cent* non-cumulative preference share contribution against which, a fund of ₹106.54 crore was released for the purpose.

Out of total 1,180 employees (including temporary and *badli* workers) as of September 2012, 671 employees were given voluntary retirement (leaving 509 employees on roll) and payment of ₹95.47 crore was made. The number of employees declined continuously due to superannuation leaving actual number of employees between 544 and 288 during 2018-19 to 2021-22.

Audit observed that NEPA did not ensure retention of sufficient skilled work force for effective and efficient implementation of Revival and Mill Development Plan while approving Voluntary Retirement Scheme. It identified only 25 employees as key personnel irrespective of their balance service up to their respective superannuation. Against the recommendation of the Board for Reconstruction of Public Sector Enterprises for recruiting minimum necessary General Managers and Deputy General Managers including 70 experienced skilled persons on regular basis, 54 persons were recruited out of which 32 persons left the job during their initial service years. Even after completion of Revival and Mill Development Plan works, operation of NEPA on a sustainable profit basis cannot be ensured without having experienced manpower.

Thus, non-availability of sufficient skilled work force with NEPA not only adversely affected the timely and effective implementation of Revival and Mill Development Plan but would also affect the future operations of NEPA.

The Ministry stated (December 2022) that insufficient skilled work force has been an issue but it was considered prudent by the Management of the day with the approval of GoI to accord voluntary retirement to save the exchequer during the period of the project. Thirty-two applications for voluntary retirement were not sanctioned as the personnel were required by the Company for successful completion of Revival and Mill Development Plan. It was further stated that Revival and Mill Development Plan was not affected because of the workforce, but many other reasons were involved in its delay.

The fact, however, remains that implementation of Voluntary Retirement Scheme without retaining minimum required skilled workforce was not prudent and it was a factor which adversely affected the implementation of Revival and Mill Development Plan activities.

Recommendation 4: The Ministry may ensure that proper monitoring mechanism exists for all major projects. Voluntary Retirement Scheme may be implemented after assessing the manpower required for completion of the project(s).

2.6 Conclusion

Revival and Mill Development Plan for NEPA Limited was sanctioned by the Cabinet in the year 2012 at a cost of ₹285 crore. The original cost ballooned to ₹512.41 crore (increase in cost by almost 80 *per cent*) by October 2021. The reasons for time and cost overrun were ineffective project management as there were undue favours to contractors and execution of additional work in violation of tender conditions. Installation of two De-Inking Plants was changed to a single De-Inking Plant without considering idling of machine, higher input cost and production effectiveness.

The Project Management Consultant did not prepare detailed estimates for various works leading to frequent revisions and cost escalation. The Project Management Consultant evaluated bids with inordinate delay, leading to cascading delays in the commencement of projects. The Project Management Consultant frequently changed its project manager which led to ineffective monitoring.

Due to non-fulfilment of export obligation, the Company lost opportunity to get waiver of import duty to the extent of ₹23.16 crore under the Export Promotion Capital Goods Scheme. It also failed to seek relief as a sick industrial undertaking from payment of damages on account of non-deposit of Provident Fund contribution which led to blocking of funds with the Employees Provident Fund Organisation.

The monitoring and supervision of Revival and Mill Development Plan activities by the Company and the Department of Heavy Industry (now Ministry of Heavy Industries) was inadequate. The Company did not retain minimum skilled workforce to ensure timely and successful implementation of the project. The Department of Heavy Industry set up a monitoring committee only in October 2018 after the Cabinet Committee on Economic Affairs gave directions to that effect while approving the revised cost of Revival and Mill Development Plan.

The Company had stopped production activities from July 2016 for implementation of Revival and Mill Development Plan works. The production was again commenced by the Company from September 2022 onwards after completion of Revival and Mill Development Plan works in August 2022, i.e., after 10 years from the date of first approval (September 2012) of the Plan.

Thus, the objectives of Revival and Mill Development Plan i.e., operation of NEPA Limited on a sustainable profit basis was yet to be achieved despite lapse of considerable time and spending of GoI funds of more than ₹500 crore.

Chapter-III
Operational Performance of Bokaro Power Supply Company (Private) Limited

CHAPTER III: MINISTRY OF STEEL

Bokaro Power Supply Company (Private) Limited

Operational Performance of Bokaro Power Supply Company (Private) Limited

3.1 Introduction

Bokaro Power Supply Company (Private) Limited (BPSCL or Company) is a Joint Venture of Steel Authority of India Limited (SAIL) and Damodar Valley Corporation with 50:50 share capital. Bokaro Power Supply Company was formed in September 2001 after SAIL transferred captive power plant at Bokaro Steel Plant consisting of eight boilers[47] with a production capacity of 1880 tonnes per hour of steam and six turbo generators with capacity to generate 302 Megawatt of power. Main objective for formation of the Joint Venture was to acquire, operate and maintain the existing captive power and steam generating station of SAIL and to supply power and steam to Bokaro Steel Plant to maintain captive status of the power plant. Bokaro Power Supply Company commissioned 9th boiler in September 2014 which increased the rated capacity for steam and power generation to 2,180 tonnes per hour and 338 Megawatt respectively. Out of 2180 tonnes per hour of steam, 1220 tonnes per hour would be used for generation of power, 960 tonnes per hour steam and 338 Megawatt power would be sold to the Bokaro Steel Plant.

The Bokaro Power Supply Company power plant is situated in the premises of SAIL/Bokaro Steel Plant. The Company is managed by the Board of Directors comprising of six Directors, three each nominated by SAIL and Damodar Valley Corporation. As per the Power and Steam Purchase Agreement between SAIL and Bokaro Power Supply Company Limited, all expenditure (variable cost or fixed cost) including Return on Equity at the rate of 15.5 *per cent* is to be borne by SAIL/Bokaro Steel Plant.

3.2 Audit objectives, Scope and Criteria

Records relating to operational performance of Bokaro Power Supply Company were examined for the period from 2016-17 to 2020-21 with the Audit objectives to assess whether (i) the power plants were operated effectively to meet the power and steam required by Bokaro Steel Plant, (ii) inputs were procured judiciously and consumption of fuels and auxiliaries were within the norms, (iii) scheduled repair and maintenance of plant and machineries were carried out timely and capital projects were implemented as planned, and (iv) statutory provisions of safety and environmental issues were complied by the Company.

Audit criteria used during the audit comprised of Power and Steam Purchase Agreement, Shared Facilities and Support Services Agreement between SAIL and Bokaro Power Supply Company, Board decisions of Bokaro Power Supply Company, Operational and Performance reports, norms fixed by Management/Central Electricity Regulatory Commission for consumption of

[47] ***Boilers 1 to 5 are named as Thermal Power Plants and Boilers 6 to 8 named as Captive Power Plants by the Company.***

fuels and auxiliaries, operating indices of some other power generating companies, Fuel Supply Agreements, Schedule for repairs and maintenance of plant and machineries, Detailed Project Reports/Feasibility Reports for projects, contracts placed for capital works, Energy Audit Reports and Notifications/guidelines issued by Ministry of Environment, Forest and Climate Change.

3. 3 Audit findings

3.3.1 Non-achievement of planned production

Clause 3.1 of the Power and Steam Purchase Agreement stipulated that SAIL and Bokaro Power Supply Company shall mutually finalise a generation schedule for the year at least thirty days in advance of each year after considering the existing operating conditions of the captive power plant (all boilers and turbines) and production plan of Bokaro Steel Plant. Accordingly, Bokaro Steel Plant annually fixed the quantity of steam and power it expected to receive from Bokaro Power Supply Company's power plants. Bokaro Steel Plant's planned requirement of steam and power from the Company, rated capacity, annual planned and actual production during 2016-17 to 2020-21 are given in Tables 3.1 and 3.2.

Table 3.1: Bokaro Power Supply Company's rated capacity, planned and actual production and Bokaro Steel Plant's planned intake of steam

(Figures in tonnes per hour)

Year	Rated Capacity	Bokaro Steel Plant's planned intake	Production Plan of Bokaro Power Supply Company	Actual production of steam	Shortfall	*Per cent* of generation with respect to Planned intake of Bokaro Steel Plant
2016-17	1960*	1485	1485	1338	147	*90*
2017-18	1960	1410	1410	1189	221	*84*
2018-19	1960	1400	1400	1134	266	*81*
2019-20	1960	1300	1300	1248	52	*96*
2020-21	1960	1052	1052	1011	41	*96*

Capacity of Boiler 1 (220 tonnes per hour) not considered as the same was out of operation since November 2016.

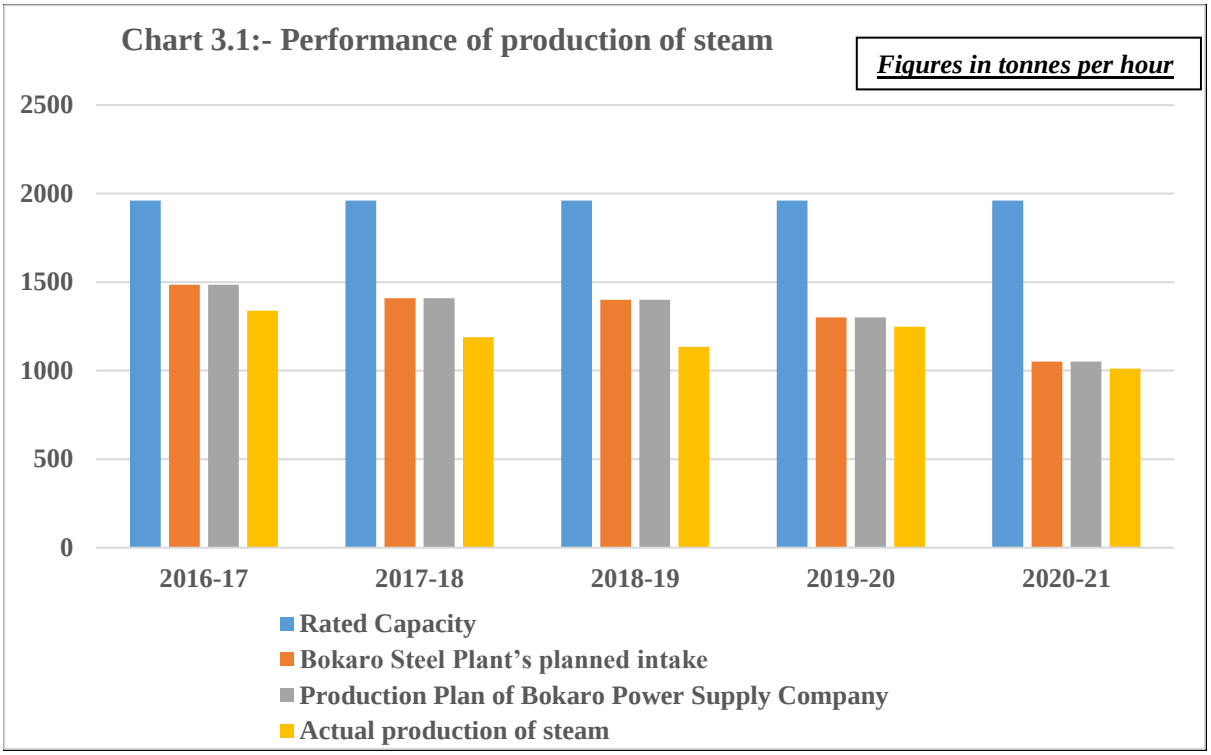
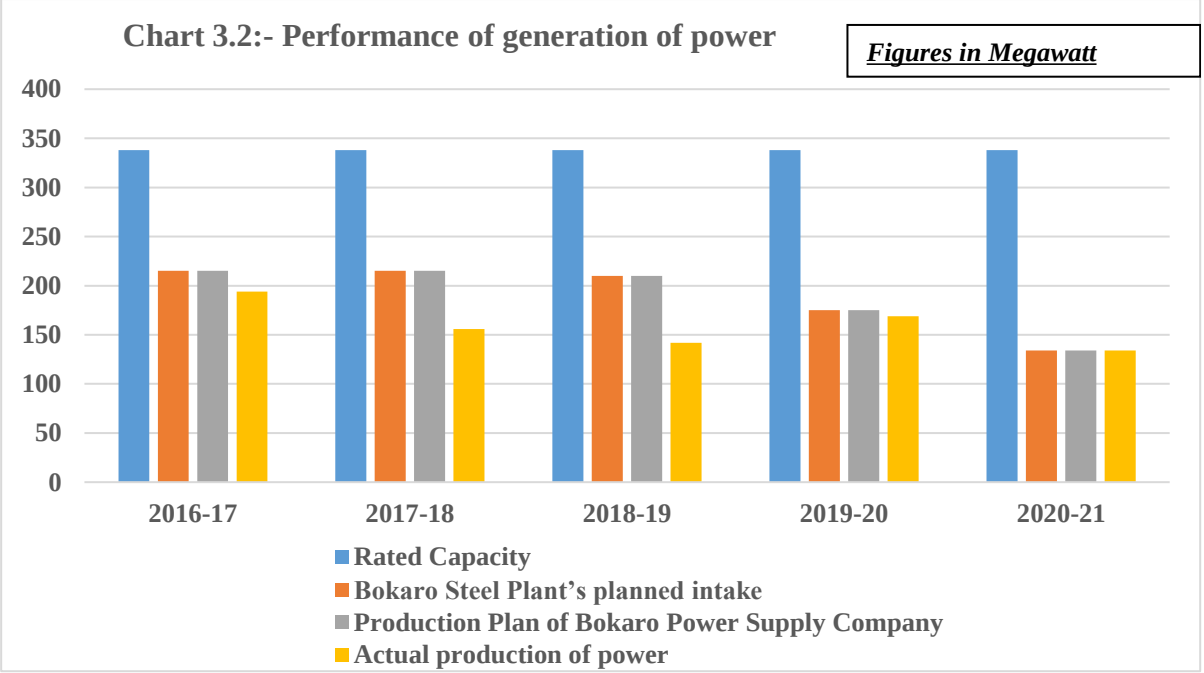


Table 3.2: Bokaro Power Supply Company's rated capacity, planned and actual production and Bokaro Steel Plant's planned intake of power

(Figures in Megawatt)

Year	Rated Capacity	Bokaro Steel Plant's planned intake	Production Plan of Bokaro Power Supply Company	Actual production of power	Shortfall	*Per cent* of generation with respect to Plan of Bokaro Steel Plant
2016-17	338	215	215	194	21	*90*
2017-18	338	215	215	156	59	*73*
2018-19	338	210	210	142	68	*68*
2019-20	338	175	175[48]	169	6	*97*
2020-21	338	134	134	134	00	*100*

[48] ***Bokaro Steel Plant reduced the intake from Bokaro Power Supply Company to purchase more power from Damodar Valley Corporation. The plan for production was revised accordingly by Bokaro Power Supply Company.***



Audit noted that:

- Annual planned production fixed by Bokaro Power Supply Company (both in respect of steam and power) was lower than the rated capacity of the plant and actual production was lower than Bokaro Steel Plant's planned intake (except power in 2020-21) from Bokaro Power Supply Company.
- Steam generation in comparison to requirement of Bokaro Steel Plant was between 81 *per cent* and 96 *per cent* during 2016-17 to 2020-21.
- Generation of power by Bokaro Power Supply Company was between 68 *per cent* and 97 *per cent* of the planned requirement of power by Bokaro Steel Plant during 2016-17 to 2019-20. The generation of power was, however 100 *per cent* of the planned requirement in 2020-21.

The Management replied (March 2022) that:

- The production of steam during 2016-17 to 2018-19 was less due to poor supply of coal and short supply of Blast Furnace and Coke Oven gas. The boilers were forced to run most of the time with coal/furnace oil support because Bokaro Steel Plant was not able to supply the required amount of Blast Furnace and Coke Oven gas**.** Further, changing fuel combustion system was not technically feasible in existing boilers.
- Though, the Fuel Supply Agreement with Central Coalfields Limited had provision for supply of imported coal, the Company did not put in efforts to obtain imported coal, to reduce the cost of power as imported coal had a higher cost.
- Bokaro Steel Plant had reduced their power requirement from Bokaro Power Supply Company from October 2019 to 175 MW and subsequently to 134 MW in 2020-21. This was done to take more power from DVC.

The Ministry added (May 2023) that Boilers 2 to 5 were multi-fueled fired boilers using Blast Furnace gas, Coke Oven gas and coal as main fuel. For achieving full rated capacity of

steaming, Boilers 2 to 5 required main fuel i.e., coal along with Blast Furnace and Coke Oven gases. These boilers could operate only on gas also, but with a reduced steaming rate. It further stated that it had approached Central Coalfields regularly to take Run of Mines coal from alternative sources (Magadh, Amrapali) etc.

Reply of the Management/Ministry may be seen in view of the following:

- Thermal Power Plants (Boilers 2 to 5) are multi fuel type boilers which could be operated entirely on coal or operated entirely on Blast Furnace and Coke Oven gases. Non-utilisation of gas would lead to increased consumption of coal. It was noted that Company did not approach Bokaro Steel Plant for higher supply of gas or make any effort for alternative sources of gas. Further, despite the recommendation by Energy Audit to reduce dependency on Bokaro Steel Plant for Blast Furnace and Coke Oven gases, the Company had not got any technical assessment done by third party for changing the fuel combustion system.

- Central Coalfields Limited did not supply the required quantity of coal. Though there were instances of loss of production due to shortage of coal, Company did not approach Central Coalfields Limited for supply of imported coal.

  Clause 11.3.1.2 of the Power and Steam Purchase Agreement stipulated that responsibility for procurement of coal would be of Bokaro Power Supply Company. Audit noted that though short supply of coal was 1.47 *per cent and* 9.15 *per cent* in 2016-17 and 2017-18 respectively, short production of steam was between 10 and 16 *per cent* respectively during the same period. Reduction in production of steam was not in proportion to shortage of coal. Moreover, as this was an operational issue, Management should have taken steps to ensure availability of coal.

- Besides, lower generation of power by Bokaro Power Supply Company resulted in Bokaro Steel Plant increasing (September 2017) the contract demand from Damodar Valley Corporation from 180 Mega Volt Ampere (MVA)[49] to 220 MVA. This was more than the quantity planned to be purchased from Damodar Valley Corporation as per the Annual Business Plan and was done despite the fact that cost of procurement of power from Bokaro Power Supply Company was cheaper than that of Damodar Valley Corporation. Bokaro Steel Plant also restricted (October 2019) the demand of power from Bokaro Power Supply Company Limited to 134 Megawatt (from 210 Megawatt per hour in 2018-19 and 175 Megawatt in 2019-20) initially for two months which was to be reviewed thereafter. However, Bokaro Power Supply Company did not approach Bokaro Steel Plant for restoration of the quantity of power after the lapse of two months.

- Management had intimated the Board (September 2018) that Boilers 1 to 5 could be operated entirely on Blast Furnace and Coke Oven gases with zero feeding of coal.

[49] ***Megawatt describes the actual power that can be supplied to the load whereas MVA includes both the power supplied to the load and the power that recirculates between the power plant and the load.***

Recommendation 1: The Company may make efforts to ensure achievement of annual requirement of power for Bokaro Steel Plant and to manage the availability of its inputs to overcome shortages constraining production.

3.3.2 Causes contributing to lower production than the plan

3.3.2.1 Low performance of Boilers

Figure 3.1: Boiler

Boilers are required to be operated optimally to conserve energy, generate required power and maintain pressure. Seven out of eight boilers in operation were installed 33 to 49 years ago and had outlived their useful life of 30 years. Hourly rates of steam generated by the boilers in Bokaro Power Supply Company during 2016-17 to 2020-21 are given in table below.

Table 3.3: Hourly rates of steam generated by each boiler

Year	**Hourly rates of steam production** (tonnes per hour)							
Boiler No.	2	3	4	5	6	7	8	9
Year of Commissioning	**1972**	**1972**	**1974**	**1978**	**1980**	**1985**	**1988**	**2014**
Rated capacity	**220**	**220**	**220**	**220**	**260**	**260**	**260**	**300**
2016-17	137.70	122.63	136.52	143.14	224.28	228.25	206.75	229.98
2017-18	125.70	119.84	125.51	125.30	223.08	208.04	220.76	230.42
2018-19	113.23	125.08	145.47	128.65	222.86	222.52	215.69	214.15
2019-20	121.89	139.78	157.94	131.72	211.48	210.95	238.86	231.00
2020-21	125.54	122.86	127.05	133.00	196.53	202.92	195.55	214.32
Average	124.81	126.04	138.50	132.36	215.64	214.54	215.52	223.97
% w.r.t rated capacity	*57%*	*57%*	*63%*	*60%*	*83%*	*83%*	*83%*	*75%*

From the above table, it is seen that four boilers (Boilers 2 to 5) were operating at lower than the rated capacity (around 60 *per cent*). Hourly rate of steam production in Boiler 9 commissioned in 2014 was only 75 *per cent* of the rated capacity which was lower than that of Boilers 6, 7 and 8 commissioned during 1980-1989. This was mainly due to forced shutdown

on account of tripping of rotors, leakages in tube[50], tripping on Rotor Earth Fault etc., which were operational reasons and should have been controlled by the Management. Therefore, the deterioration in steam production was largely due to inadequate repair and maintenance resulting in lower boiler efficiency.

Management replied (March 2022) that Bokaro Power Supply Company was keeping one thermal power plant boiler and one captive power plant boiler in reserve since October 2019 due to less requirement of steam and power by Bokaro Steel Plant.

The reply of the Management may be seen in the light of the fact that the performance of boilers was low throughout the period 2016-17 to 2020-21, whereas one thermal[51] power plant boiler and one captive power plant boiler each were kept in reserve only from November 2019 onwards. Moreover, the equipment were kept in reserve on account of lower demand of steam and power by Bokaro Steel Plant, which in turn was the consequence of the failure of Bokaro Power Supply Company in supplying the power demanded by Bokaro Steel Plant.

The Ministry added (May 2023) that had there been free availability of Blast Furnace and Coke Oven gases in the market or purchase of coal from sources other than Central Coalfields Limited or Bharat Coking Coal Limited, the said operational issues would have been addressed. Further, Boiler 9 was commissioned in September 2014 and took time to stabilise.

The reply may be seen in view of the fact that even though the Company was aware that it was dependent on Bokaro Steel Plant for supply of Blast Furnace and Coke Oven gases, the Company did not explore the possibility of getting gases from alternative sources. The Fuel Supply Agreement with Central Coalfields provided for supply of imported coal but Bokaro Power Supply Company Limited did not approach the coal companies for supply of imported coal. As the Boiler 9 was commissioned in September 2014, there was sufficient time for stabilisation of the boiler. Ministry reply is silent on inadequate repairs and maintenance of boilers as pointed out in the para.

3.3.2.2 Low performance of Turbo Generators

Figure 3.2: Turbo Generator

Bokaro Power Supply Company Limited was capable to generate 338 Megawatt power with seven turbo generators under full load of operations.

Performance of turbo generators are given in the table below-

[50] ***There are water walls made of tubes around the furnace which heat the water. There were leakages in these tubes.***

[51] ***Boilers 1 to 5 have been named as thermal power plant boilers and 6 to 8 as captive power plant boilers by the Company.***

Table 3.4: Performance of Turbo Generators

Power Generation in Megawatt							
Turbo Generator No.	1	2	3	6	7	8	9
Year of commissioning	**1974**	**1972**	**1973**	**1986**	**1988**	**1989**	**2014**
Rated capacity	**12**	**55**	**55**	**60**	**60**	**60**	**36**
2016-17	2.93	3.25[52]	38.40	33.66	51.09	48.34	16.09
2017-18	2.52	30.70	22.53	27.11	30.36	27.18	15.61
2018-19	2.83	27.93	23.43	27.05	21.15	25.79	13.58
2019-20	3.67	30.49	22.84	35.63	39.65	23.80	13.14
2020-21	3.74	31.50	21.98	27.31	11.87	24.46	13.37
Average	**3.14**	**24.77**	**25.84**	**30.15**	**30.82**	**29.91**	**14.36**
Average (%)	***26***	***45***	***47***	***50***	***51***	***50***	***40***

Audit noted that performance of turbo generators was only between 26 *per cent* and 51 *per cent*. The performance of Turbo Generator 9 which was commissioned in 2014, was also low and ranged between 13.14 Megawatt and 16.09 Megawatt. Main reasons for lower performance were tube leakage, power failure etc. These were mainly due to lack of overhauling/capital repairs on time as discussed in *para 3.3.2.3* below.

Management/Ministry replied (March 2022/May 2023) that Bokaro Power Supply Company operated at lower load, as Bokaro Steel Plant was an integrated steel plant and its steam and power requirements were both for production purpose as well as to ensure safety of working personnel and equipment in case of any emergencies.

The reply is not justifiable as all turbo generators were not required to run at half capacity for meeting any probable emergencies. Also, the reply may be seen in the light of the fact that during 2012-13 to 2016-17, the Company was producing power ranging between 166 Megawatt and 195 Megawatt and only subsequently there was a reduction in the generation of power. This indicated that performance of turbo generators could have been increased by taking proper corrective action and timely repairs to address the avoidable reasons for low performance of turbo generators.

3.3.2.3 Lack of proper repair and maintenance

Central Electricity Regulatory Commission stipulated 25 years useful life for thermal based power generating units. Energy Audit Report on Bokaro Power Supply Company for the year 2016 envisaged 30 years useful life for power plant. Capital maintenance and technical renovation of various plants and machineries is of vital importance to achieve good performance thereafter. As boilers at Bokaro Power Supply Company had outlived their useful life of 30 years, Bokaro Power Supply Company fixed norm for overhauling of boilers within two to three years. Audit noted that out of 8 boilers, overhauling was done within the scheduled time in respect of only three boilers (Boilers 4, 6 and 7). Capital repair of Boiler 8 was done

[52] ***There was a fire incident in Turbo Generator 2 in October 2015. It was brought back to operation in February 2017. Therefore, the production was low during 2016-17.***

after gap of six years. Audit examined the planned shutdown, forced outages and total working hours for the period from 2016-17 to 2020-21 as below:

Table 3.5: Total hours, available working hours and forced outages of Boilers

Year	Total hours	Total working hours	Total planned shutdown hours	Percentage of planned shutdown hours against total working hour	Total forced shutdown hours	Percentage of forced shutdown hours against total working hour
1	**2**	**3**	**4**	**5**	**6**	**7**
2016-17	77,078	63,391	13,687	21.59	1,761	2.78
2017-18	77,509	57,347	19,785	34.50	1,299	2.27
2018-19	77,761	55,475	22,210	40.04	1,078	1.94
2019-20	77,492	60,402	18,202	30.13	1,624	2.69
2020-21	76,264	50,565	25,699	50.82	2,551	5.04

From the table above, it may be seen that the percentage of planned shutdown hours against total working hours was in the range of 21.59 *per cent* to 50.82 *per cent* whereas that of forced shut down hours was in the range of 1.94 *per cent* to 5.04 *per cent*. The planned shutdown was mainly due to capital repair, repair and maintenance, non-availability of gases, shortage of coal and less requirement of steam and power from Bokaro Steel Plant since October 2019. Despite being aware of the shortage of gases and coal in advance, no corrective action was taken by the Management. Forced outages were mainly due to tube leakages which could have been reduced with proper repair and maintenance.

In case of turbo generators, Bokaro Power Supply Company fixed norm for capital repair/overhauling after 50,000 running hours. Audit noted that out of six turbo generators, two (Turbo Generators 6 and 7) were not due for capital repairs as they had not surpassed 50,000 hours from the last capital repairs and remaining four were operated for more than 21,000 to 63,000 hours beyond scheduled capital repair i.e., 50,000 hours. Original Equipment Manufacturer of Turbo Generator 2 had recommended for scheduled capital repair after 45,000 hours of running, whereas the last repair was done in March 2009. Management did not overhaul the equipment even after running of 93,736 hours. Delays in overhauling of the turbo generators impacted their functioning. Problems in smooth changing of load, higher steam consumption and higher iron and copper temperature in generator winding were noted by the Management due to which the load on turbine could not be increased beyond 40 Megawatt against its capacity of 55 Megawatt.

Management replied (March 2022) that overhauling plan for boilers in 2-3 years was tentative and varied as per shut down availability and prevailing requirement of steam and power from Bokaro Steel Plant. Boilers 2 and 3 were kept under planned shut down and hence effective gap was lower. Main reason of delay in overhauling of Boiler 5 was unavailability of Air Pre

Heater[53] blocks. Capital repair of Boiler 8 was done in October 2020. It also further stated that it now planned to do overhauling of boilers as per schedule.

In respect of turbo generators, Management stated that capital repair was not carried out in Turbo Generator 1 because full capacity utilisation could not be achieved. Turbo Generator 2 had a major fire incident in October 2015. Contract for capital repair of Turbo Generator 2 could not be awarded due to lack of interest from the bidders and new tender for capital repair of Turbo Generator 2 would be issued shortly. Thereafter, capital repair of other turbo generators would be taken up as per recommended schedule.

Ministry replied (May 2023) that Boilers 2 and 3 were under shut down for a considerable period due to non-availability of Blast Furnace and Coke Oven gases from Bokaro Steel Plant and shortage of coal. In case of Boiler 8, scheduled date of its last overhauling was on November 2019 which got delayed by 11 months. In case of Turbo Generator 1, the rate of wear and tear was less due to operating at a low load condition. After finalisation of Residual Life Assessment work order, the overhauling would be taken up immediately.

Reply of the Management/Ministry may be seen in view of the fact that as per norms fixed by the Management, the overhauling of boilers was to be scheduled in 2-3 years and not on the basis of working hours. Moreover, procurement of critical spares like Air Pre Heater blocks in time was an operational issue and should have been addressed by the Management. Also, to ensure smooth operations, even though turbo generators were not operated at rated capacity, overhauling was required to be done as per the norms of 50,000 running hours fixed for overhauling.

Recommendation 2: The Company may ensure that the boilers and turbo generators are repaired and maintained as per the norms fixed by the Management to reduce the shutdown hours.

3.3.2.4 Non-implementation of Energy Audit recommendations

Energy Audit Services, Faridabad conducted (2016) the Energy Audit of the Company and expressed major concerns in areas such as (i) Ingress Air[54] be identified and rectified, as a part of routine maintenance, (ii) High un-burnt carbon in fly ash, (iii) Reconditioning of certain Air Pre Heater Units**:** temperature of the Exit Flue gas would be much higher causing proportionately higher level of heat loss through the chimney and resultant higher coal consumption and (iv) Reduce chimney loss. To address these issues, 14 recommendations were given after the Energy Audit. Bokaro Power Supply Company complied with nine of these recommendations. Five recommendations that were not yet complied were: (i) to restrict air ingress and reduce loss of boiler efficiency, major repairs and maintenance of thermal power plant boilers be done (ii) Installation of new turbo generator set after major repairs and maintenance, (iii) Burner Management System be introduced to help boilers to operate under a steady load with even low availability of blast furnace and coke oven gases, (iv) Installation of

[53] ***The purpose of the Air Pre Heater unit is to recover the heat from the boiler flue gas, which increases the thermal efficiency of the boiler by reducing the useful heat loss in the flue gas.***

[54] ***Lot of air entering into the ducting system commonly known as Ingress Air.***

water filtration system and (v) Variable frequency drives[55] be planned for forced draft[56] fan of thermal power plant boilers.

Audit noted the following due to non-implementation of above recommendations:

- The loss due to dry flue gas increased in Boilers 2, 6 and 8.
- Bokaro Power Supply Company fixed norms for un-burnt carbon in fly ash and bottom ash as 2 to 3 *per cent* and 6 to 8 *per cent* respectively. Percentage of un-burnt carbon in fly ash and bottom ash in thermal power plant boilers, captive power plant boilers and Boiler 9 during 2016-17 to 2020-21 were as below:

Chart 3.3: Percentage of un-burnt carbon in fly ash

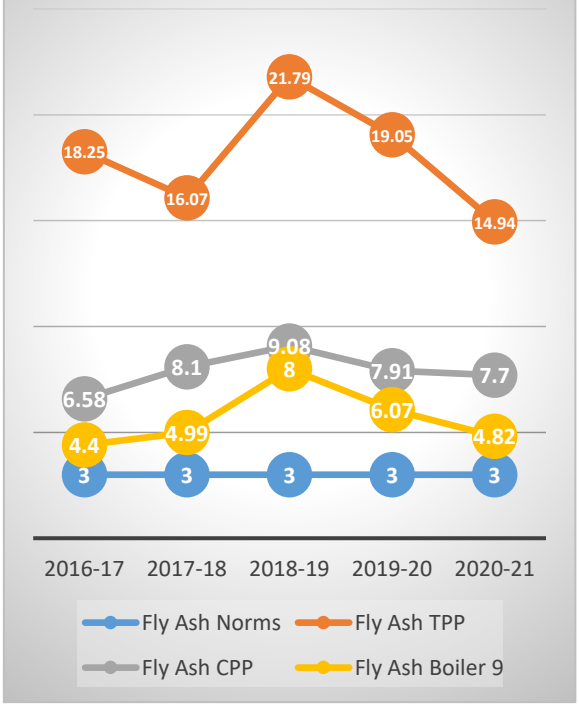
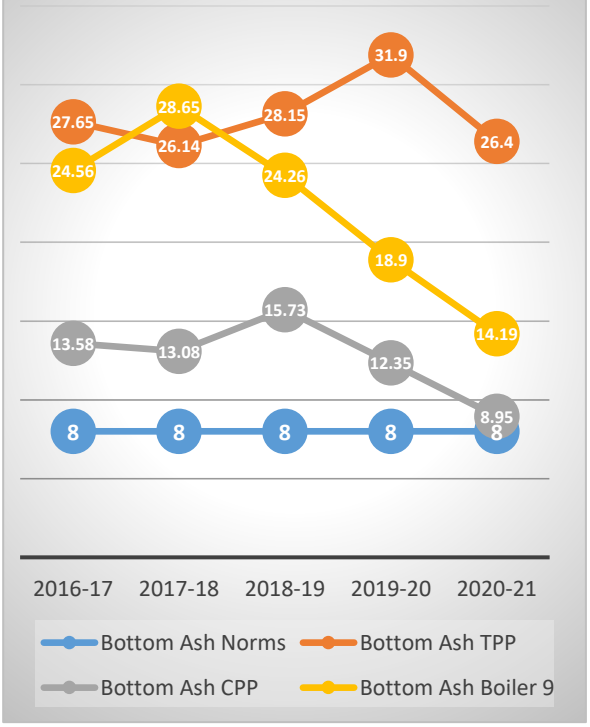


Chart 3.4: Percentage of un-burnt carbon in bottom ash



From the above charts it is seen that in case of fly ash the percentage of un-burnt carbon was between 14.9 to 21.8 *per cent*, 6.6 to 9.1 *per cent* and 4.4 to 8 *per cent* against the norms of 3 *per cent* in thermal power plant boilers, captive power plant boilers and Boiler 9 respectively. In case of bottom ash the percentage of un-burnt carbon was between 26.1 to 31.9, 8.9 to 15.7 and 14.2 to 28.6 *per cent* against norm of 8 *per cent* in thermal power plant boilers, captive power plant boilers and Boiler 9 respectively.

Since boilers were in continuous use over more than 30 years, various sections of these boilers such as structural elements, pressure parts, refractory lining, ducts etc., were badly damaged resulting in air ingress in large amount causing high un-burnt carbon levels, partial loading of coal, low efficiency etc. Thus, due to higher percentage of un-

[55] ***Variable Frequency Drives are used to control the speed of fans, pumps, and mills in power plants.***
[56] ***Forced draft is achieved by forcing air into a furnace with a special fan and ductwork.***

burnt carbon in fly ash and bottom ash against norms, 2.69 lakh tonnes of un-burnt carbon equivalent to ₹ 284.41 crore[57] value of coal was not utilised. Thus, even though the Energy Audit recommended (2016) to control loss of flu gas and un-burnt carbon to increase the boiler efficiency, Management had not taken concrete action in this regard.

- As per the Energy Audit report (2016), boiler thermal efficiency above or equal to 84 *per cent* is very good, equal to or above 80 *per cent* is good and below 80 *per cent* needs corrective action. Boiler thermal efficiency in all the boilers (except 6,7, 8 and 9) was below 80 *per cent* (ranging between 50 *per cent* and 74 *per cent*) during 2016-17 to 2020-21 which indicated that corrective action was required to be taken.

Management replied (March 2022) that:

- Proposal for major repair and maintenance of thermal power plant boilers consisting of transformation of existing 'Bare tube water wall'[58] to 'Membrane type'[59] was initiated but subsequently dropped on the recommendation of the committee consisting of experts from Damodar Valley Corporation, SAIL and Bokaro Power Supply Company that such type of job was very rarely done and success rate was very low. Tender for water filtration system could not materialise due to technical constraints and the installation of Variable frequency drives could not materialise due to constraint of space.

- As the implementation of recommendation regarding changing the design of the thermal power plant boiler was not possible, the possibility of installing a new boiler was being explored. As repair and maintenance of boiler did not happen, installation of new turbo generator was not processed.

- It was continuously monitoring health of ducts, air pre heaters and carried out repair work during shut downs. Minimisation of air ingress into boilers were being done on continuous basis which resulted in reduction of unburnt carbon in Boiler 7, 8 and 9.

- It was very difficult to increase efficiency of boilers to their design value after servicing of more than 30 years by only doing capital repair/maintenance work.

The Ministry added (May 2023) that the recommendations of Energy Audit which were not implemented were either techno-commercially not feasible or retendered for reasons not attributable to Bokaro Power Supply Company Limited.

The reply of the Management/Ministry may be seen in view of the fact that:

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[57] ***Calculation was made on the basis of year wise consumption of total coal used in thermal power plant, captive power plant and Boiler 9 separately and thereafter apportioned them in fly ash (80 per cent) and bottom ash (20 per cent) of ash content. The excess carbon (than the norm of fly ash (3 per cent) and bottom ash (8 per cent)) was multiplied by the coal procurement rate.***

[58] ***These are tubes in the boiler where water is evaporated to steam. These tubes also form the walls of the boiler.***

[59] ***A series of tubes welded together tangentially or with membrane bar between them to form the walls of the boilers combustion chamber.***

- Even after three years from the Committee's recommendation (March 2020) for not pursuing proposals of Energy Audit related to certain specific areas (on the ground that such jobs were very rarely done and success rate was very low), no further action was taken to address those concerns.

- The matter was brought before the Board Committee meeting (April 2022) and it was decided to engage a consultant for preparation of feasibility study for installation of a new multi-fuel boiler of around 300 tonnes per hour capacity. This was still under finalisation.

- There was no significant improvement in loss due to dry flue gas, which rather increased in Boilers 2, 6 and 8. Though, reduction of unburnt carbon in Boilers 7, 8 and 9 was noted between 30 November 2021 to 8 February 2022, other boilers had more percentage of unburnt carbon in fly ash and bottom ash.

- Management accepted that increase in efficiency of boilers was low due to old age however no concrete action was taken for a viable solution.

Recommendation 3: The Company may make efforts to reduce unburnt carbon in boilers to reduce the consumption of coal and take appropriate steps to address the issues raised by the Energy Audit.

3.3.3 Execution of Projects

3.3.3.1 Non replacement/augmentation of Boiler 1

Bokaro Power Supply Company had nine boilers out of which eight were installed more than 32 years ago. The Company decided (October 2012) for extensive repair and maintenance of thermal power plant Boilers 1 to 5 (installed between 1972 and 1985) as the boilers had outlived their useful life. Boiler 1 was not in operation since November 2016 due to its poor operating and safety condition. Bokaro Power Supply Company Board directed (2019) to make firm action plan to revive it to keep in safe condition. A Committee constituted (February 2020) for study for revival of Boiler 1 observed (March 2020) that due to non-repair and continuous service over more than last forty years, various sections of the boiler were badly damaged resulting in air ingress in large amount causing high un-burnt carbon levels, partial loading, low efficiency, etc. The Committee recommended (October 2020) for installation of new boiler with not less than the present capacity which can run both on pulverisation of coal as well as on blast furnace gas, coke oven gas and convertor gas (Linz-Donawitz) generated in Bokaro Steel Plant. The Board approved (October 2020) the recommendation and directed to get budgetary offer from the Consultancy wing of NTPC, which was nominated to be hired as a consultant for installation of the boiler. Bokaro Power Supply Company requested (November 2020) for budgetary offer from Consultancy wing of NTPC.

Management/Ministry replied (March 2022/May 2023) that Consultancy Wing of NTPC had been assigned (February 2022) the work of preparation of feasibility study for installation of a new multi-fuel fired boiler of about 300 tonnes per hour capacity. However, it further stated (November 2022) that Consultancy wing of NTPC had shown its inability and the process for finalisation of another consultant was underway.

Thus, even after a lapse of more than six years since Boiler 1 was out of operation and ageing of the other boilers, Management has not finalised a full time consultant for either installation of a new boiler or revival of Boiler 1 as NTPC had refused (March 2022) consultancy for such low capacity boiler.

3.3.3.2 Non replacement of steam pipeline

BHEL recommended (1996) for replacement of old 100 atmosphere absolute (ata)[60]/540^{0}C steam pipelines of Boilers 4 and 5 to prevent any sudden failure of the pipelines, enhance reliability and safety of the plant and to help in improving the efficiency. Audit noted that during last 24 years, Management had taken several initiatives to finalise the contract for replacement of above pipelines, however, the same was not successful mainly due to delay in appointment of consultant, non-finalisation of commercial terms and conditions of the consultant, delay in tendering etc. Bokaro Power Supply Company submitted (April 2022) drawing and design to Consultancy wing of NTPC who found the drawings insufficient and suggested to develop as on date drawings with essential technical details by using the latest technology available. Thus, due to non-replacement of pipelines even after lapse of 26 years since the recommendation to replace it, Bokaro Power Supply Company continues to operate the pipelines below its capacity[61] affecting its operating efficiency. Also, the safety concerns due to potential threat of any accident or failure of pipelines cannot be ignored.

Management replied (March 2022) that the work order would be issued within one month and the drawings be developed within two months. Thereafter, Consultancy wing of NTPC would be engaged as the consultant and tender for replacement floated.

Ministry added (May 2023) that fresh enquiry was floated, and work order placed on 13 October 2022. The drawings had been sent to NTPC for their views and final acceptance by Bokaro Power Supply Company Limited. After finalisation of the drawings. NTPC would be asked to submit their offer for Project Management Consultancy.

The fact remained that even after a lapse of 26 years since the recommendation to replace the steam pipelines, the Company was not able to change the steam pipelines.

3.3.3.3 Non-completion of Solar power units

The Company decided (September 2016) to install solar power units in and around Bokaro Steel Plant for supply of green power. The work was completed in April 2019 after delay of 16 months from the scheduled date of completion. The solar power units were not handed over for operation due to non-completion of Performance Guarantee test.

Audit observed that the agency scheduled Performance Guarantee test on 6 May 2019 and requested (2 May 2019) Bokaro Power Supply Company for trimming of trees, as due to shadow, modules would be affected. It also stated that the Performance Guarantee test be performed during the months of March to May. Bokaro Power Supply Company however trimmed the trees in June 2020 and asked the agency for Performance Guarantee test. However,

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[60] ***1 ata=1.033kg/square cubic metre.***

[61] ***The designed inlet steam pressure for the turbine was 90 ata and the working pressure is maintained at or below 85 ata resulting in loss of efficiency and heat rate.***

the Performance Guarantee test was not conducted and the project was not handed over for operation. In this regard, it was noted that power was being generated from the solar power units and being supplied to Bokaro Steel Plant. However, bills for the same could not be raised as the Power Purchase Agreement had not been signed. Bokaro Power Supply Company could not raise the bill amounting to ₹ 0.86 crore[62] on Bokaro Steel Plant.

Management replied (March 2022) that they were in the process of taking up left over work and commence the operation and maintenance of the Plant through some external agency.

Ministry replied (May 2023) that a proposal had been put up to Board Committee for Contract and Tender (February 2023) for termination of the contract for negligence on the part of contractor to complete the project and failure to carry out the comprehensive operations and maintenance.

Audit noted that the amount of ₹8.71 crore invested in 2019 could not be utilised fruitfully. Bokaro Power Supply Company failed to raise bills on Bokaro Steel Plant due to absence of Power Purchase Agreement and the left over work and required operation and maintenance of the solar power plant also could not be completed.

Recommendation 4: Company may expedite its efforts to complete the solar power units so as to utilise its investment fruitfully and to supply green power.

3.3.4 Non achievement of operational parameters

The norms stipulated by Central Electricity Regulatory Commission are not applicable to captive power plants. However, the Quality Policy of Bokaro Power Supply Company *inter-alia*, stipulated, achieving the norms as fixed by Central Electricity Regulatory Commission from time to time in respect of various operational parameters like Normative Plant availability factor[63], Auxiliary Power consumption[64], Specific Oil consumption[65] and Heat rate[66] etc. Audit noted that Bokaro Power Supply Company could not achieve the norms of Central Electricity Regulatory Commission in respect of operational parameters as the Company did not have any incentive to improve its operational parameters because as per its Power and Steam Purchase Agreement with SAIL, all expenditure including Return of Equity @15.5 *per cent* was to be borne by SAIL. The details are discussed in the following paragraphs.

3.3.4.1 Extra expenditure due to low Plant Load Factor

Central Electricity Regulatory Commission stipulated 'Plant Load Factor' for thermal generating station which is expressed as a percentage of sent out energy corresponding to installed capacity during a period. Central Electricity Regulatory Commission also stipulated

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62 ***Power generated by solar power equipment for 2019-20 and 2020-21 being 17,43,062 kilo watt at the rate of ₹ 4.98 per kilo watt.***

63 ***Plant Availability Factor in relation to a generating station for any period means the average of the daily declared capacities for all the days during the period expressed as a percentage of the installed capacity in MW less the normative auxiliary energy consumption.***

64 ***Auxiliary energy consumption means the quantum of energy consumed by auxiliary equipment of the generating station, expressed as a percentage of the sum of gross energy generated.***

65 ***Specific oil consumption means oil consumed for generating power.***

66 ***Gross Station Heat Rate means the heat energy input in kilo calories required to generate one kilowatt hour of electrical energy.***

Normative Annual Plant Availability Factor for Damodar Valley Corporation[67] units at Bokaro, Chandrapura and Durgapur as 85 *per cent*, 75 *per cent* and 74 *per cent* respectively. However, Central Electricity Regulatory Commission norms for Plant Load Factor is applicable for commercial power generating stations and not for captive power plants. It was seen that during the period 2016-17 to 2020-21, Plant Load Factor of Bokaro Power Supply Company was less than the Plant Load Factor achieved by NTPC and Damodar Valley Corporation (Chandrapura Thermal Power Station).

For the purpose of comparative analysis, Plant Load Factor of Bokaro Power Supply Company and other captive power generating companies (of Rashtriya Ispat Nigam Limited and NTPC SAIL Power Company Limited) during 2016-17 to 2020-21 is given in the following table.

Table 3.6: Comparison of Plant Load Factor achieved by power generating companies

(units in per cent)

Year	Bokaro Power Supply Company	Rashtriya Ispat Nigam Limited	NTPC SAIL Power Company Limited		
			Bhilai	Durgapur	Rourkela
2016-17	57	14	53	95	94
2017-18	46	64	63	92	96
2018-19	42	87	73	93	96
2019-20	50	85	78	88	93
2020-21	40	58	63	82	99

Plant Load Factor in Bokaro Power Supply Company was lower than that of other captive power plants like those of Rashtriya Ispat Nigam Limited (except in 2016-17) and NTPC SAIL Power Company (except Bhilai in 2016-17). Further, non-achievement of even the lowest Central Electricity Regulatory Commission norms for thermal generating stations (74 *per cent*)[68] and non-achievement of maximum target given by Bokaro Steel Plant to Bokaro Power Supply Company during 2016-17 to 2020-21 (215 Megawatt i.e., about 64 *per cent*) resulted in shortfall in generation of 1,398 million units of power during 2016-17 to 2020-21 and loss of profit margin of ₹49.47 crore.[69]

Management replied (March 2022) that Central Electricity Regulatory Commission norms for Plant Load Factor was for commercial power generating stations of higher capacity and that it could not generate more power than the requirement given by Bokaro Steel Plant.

The reply of the Management may be viewed in the light of the fact that Quality Policy of the Company stipulates to achieve the Central Electricity Regulatory Commission norms. Further, the captive power plants attached to other Steel Sector Companies like Rashtriya Ispat Nigam Limited and NTPC SAIL Power Company were also having higher Plant Load Factor. Also,

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[67] ***Plant Load Factor of Damodar Valley Corporation has been considered as it is one of the old pioneer Government power generating companies and is also 50 per cent partner of the joint venture Bokaro Power Supply Company.***

[68] ***Being the lowest norm fixed by Central Electricity Regulatory Commission for Damodar Valley Corporation Durgapur unit.***

[69] ***As power generation by Bokaro Power Supply Company was mainly dependent on the requirement placed by Bokaro Steel Plant, hence for calculation of Plant Load Factor, maximum demand placed by Bokaro Steel Plant has been considered.***

due to lower production by Bokaro Power Supply Company, Bokaro Steel Plant restricted power requirement from Bokaro Power Supply Company only from October 2019.

The Ministry replied (May 2023) that the Plant Load Factor of Bokaro Power Supply Company Limited was lower as compared to power plants of Rashtriya Ispat Nigam Limited and NTPC SAIL Power Company Limited due to the fact that those plants were not supplying processed steam to steel plants. All units of power plants of Rashtriya Ispat Nigam Limited and NTPC SAIL Power Company Limited, except one 120 Megawatt unit of Rashtriya Ispat Nigam Limited, were coal based and were not dependent on the supply of Blast Furnace and Coke Oven gases from steel plants.

The reply of the Ministry may be seen in view of the fact that the power plants of Bokaro Power Supply Company Limited were designed to supply steam to steel plants and for generation of power simultaneously. Supply of gases and coal should have been ensured by the Management through alternate arrangements.

3.3.4.2 Excess consumption of steam

Bokaro Power Supply Company fixed norm for consumption of steam to generate 1 Megawatt power as 3.92 tonnes for thermal power plant and 3.79 tonnes for captive power plant turbines[70]. The Company however fixed target of 4 tonnes for generation of 1 Megawatt power in its annual plan. Audit noted that consumption of steam was more than the norms as well as target fixed by the Company. The steam consumption was between 4.12 and 4.16 tonnes per Megawatt during 2016-17 to 2020-21. This resulted in excess consumption of steam and loss of generation of power by 236.52 million units with profit margin of ₹ 8.36 crore during 2016-17 to 2020-21.

Management replied (March 2022) that steam consumption was higher since the machineries were more than 35-40 years old and were of old design.

Reply of the Management may be seen in the light of the fact that audit has considered the loss with respect to target fixed by the Management itself in its Annual Plan, which was fixed after considering all factors including age of plants. Further, the Board of Directors also directed (April 2019) to limit consumption of steam by 4 tonnes per Megawatt through regular Condenser Cleaning. In Rashtriya Ispat Nigam Limited, steam consumption rate was between 3.68 tonnes per Megawatt and 3.86 tonne per Megawatt during the same period.

Ministry replied (May 2023) that a six years rolling plan for overhauling of boilers and turbines had been prepared and Bokaro Power Supply Company Limited would try to adhere to the schedule of overhauling of turbines to reduce the steam consumption.

3.3.4.3 Excess Station Heat Rate

Heat rate indicates efficiency of a power plant which is inversely related to efficiency i.e., lower heat rate indicates better efficiency. Central Electricity Regulatory Commission notified Gross Station Heat Rate (SHR) as 2,750 and 2,850 Kilo calorie per Kilo Watt for Badarpur, Talcher and Tanda NTPC units and 2,700 to 3,100 Kilo calorie per Kilo Watt for Bokaro Thermal Power

[70] ***The norm for consumption of steam of 3.92 tonne per Megawatt for Thermal Power Plant and 3.79 tonne per Megawatt for captive power plant turbine were given by manufacturer.***

Station, Chandrapura Thermal Power Station and Durgapur Thermal Power Station of Damodar Valley Corporation.
Station Heat Rate of Bokaro Power Supply Company, Rashtriya Ispat Nigam Limited, Damodar Valley Corporation and National Thermal Power Corporation are tabulated below:

Table 3.7: Comparison of station heat rate of Bokaro Power Supply Company with other power plants

Year	Bokaro Power Supply Company	Rashtriya Ispat Nigam Limited	Damodar Valley Corporation			NTPC
			Bokaro	Chandrapura	Durgapur	(different units)
2016-17	3,196	3,115	2,766	2,567	2,707	2,292-2,685
2017-18	3,049	2,699	2,606	2,345	2,648	2,186-2,846
2018-19	3,209	2,577	2,807	2,323	2,652	2,125-2,859
2019-20	3,167	2,690	2,705	2,331	2,635	2,153-3,167
2020-21	3,224	2,697	2,733	2,366	2,656	2,082-2,936

Audit noted that Station Heat Rate of Bokaro Power Supply Company was between 3,049 Kilo calorie per Kilo Watt and 3,224 Kilo calorie per Kilo Watt during 2016-17 to 2020-21. In Rashtriya Ispat Nigam Limited, Station Heat Rate was between 2,577 and 3,115 Kilo calorie per Kilo Watt, in Damodar Valley Corporation (Bokaro, Durgapur and Chandrapur unit) it ranged between 2,323 and 2,807 Kilo calorie per Kilo Watt whereas in NTPC the same was between 2,082 and 3,167 Kilo calorie per Kilo Watt. Thus, the heat rate in Bokaro Power Supply Company was more than the Central Electricity Regulatory Commission norms as well as Station Heat Rate of other power generating companies like Damodar Valley Corporation, NTPC and power plant of Rashtriya Ispat Nigam Limited. Due to higher station heat rate, Bokaro Power Supply Company generated less power. High Station Heat Rate also indicates inefficiency of boilers and turbines and excess consumption of fuels.

Management replied (March 2022) that Central Electricity Regulatory Commission norms for station heat rate were for commercial power plants. Ministry added (May 2023) that Bokaro Power Supply Company had to operate more numbers of smaller capacity and old units to cater both uninterrupted steam and power requirement of Bokaro Steel Plant.

Audit noted that the Quality Policy of the Company stipulates to achieve the Central Electricity Regulatory Commission norms. Further, Central Electricity Authority notified (March 2019) norm for Station Heat Rate as 2,600 Kilo calorie per Kilo Watt irrespective of the age or technical parameter of power plants.

Recommendation 5: The Company may make efforts to improve its operational parameters like Plant Load Factor, Consumption rate of Steam and Station Heat Rate and bring it at par with other comparable units so that no further loss is incurred on account of higher cost.

3.3.5 Coal Management

Bokaro Power Supply Company procures coal from Central Coal Fields Limited, Bharat Coking Coal Limited and SAIL. It entered into Fuel Supply Agreements on 30 April 2008 and

3 May 2014 with Central Coal Fields Limited with annual contracted quantity of 8,75,532 tonnes and 1,73,300 tonnes (for Boiler 9) respectively. The validity of Fuel Supply Agreements was five years which was extended till 2023 and 2024 respectively. Bokaro Power Supply Company also entered (April 2008) into an agreement with Bharat Coking Coal Limited for Annual Contracted Quantity of 5,52,000 tonnes which is valid till 2023.

Clause 5 of the Fuel Supply Agreements with Central Coal Fields Limited and Bharat Coking Coal Limited stipulated that the seller should take all reasonable steps to remove stone, shale and extraneous matters before loading the coal. Further, the purchaser should inform the seller about all incidence of presence of stones in any specific consignment immediately on its detection at the delivery point.

Figure 3.3: Coal Stock Yard

Audit noted that stones, shale and extraneous matters were mixed with the coal supplied in a regular manner. Bokaro Power Supply Company received 11,140 tonnes of stone/ boulders valuing ₹4.50 crore during 2016-17 to 2020-21. Bokaro Power Supply Company however, did not raise the issue with the coal companies. This resulted in extra expenditure of ₹4.69 crore (including ₹0.19 crore as picking cost).

Management replied (March 2022) that quantity of stone/boulders was negligible i.e., 0.14 *per cent* of total quantity of coal handled and mostly they were coming from Chasnalla[71]/SAIL.

The reply of the Management may be seen in the light of the fact that stone, shale and extraneous material was continuously being received with the coal. Even, if that was the case, records were also not maintained relating to extraneous material/lumpy coal/stones/muddy coal supplied by Central Coal Fields Limited, Bharat Coking Coal Limited and Chasnalla separately. Bokaro Power Supply Company should have taken up the matter regarding supply of stone/boulders with Chasnalla/SAIL as this was increasing expenditure of Bokaro Power Supply Company and the cost of power.

[71] ***Chasnalla is a captive colliery of SAIL. Bokaro Power Supply Company procures coal from Central Coal Fields Limited, Bharat Coking Coal Limited and SAIL. SAIL adjusted the price of Chasnalla coal through power cost.***

3.3.5.1 Unclaimed rebate of ₹ 41.38 crore on account of higher ash content in coal supplied

Clause 8.1 of Fuel Supply Agreements with Central Coalfields Limited stipulated that if the purchaser is desirous of availing joint sampling (third party sampling in case of Fuel Supply Agreement with Bharat Coking Coal Limited), such facility shall be allowed at the Delivery Point only and for the coal produced from Seller's own sources and not for imported coal. Clause 8.2 of the Fuel Supply Agreements stipulated that sample shall be drawn separately for the supplies made, from each colliery, grade wise and the venue for collection of samples by the third party shall be the delivery point. Price notification of Central Coalfields Limited (2 February 2019) and Bharat Coking Coal Limited (29 January 2019) stipulated bonus or penalty at the rate of ₹ 7 per tonne charged for each 0.1 *per cent* increase or decrease in ash content above or below 34 *per cent*.

Audit reviewed the bills of Central Coalfields Limited and Bharat Coking Coal Limited for 2020-21 and noted that in case of supply from Rajrappa/Central Coalfields Limited washeries, ash content was not indicated in the invoices for 2020-21. However, from the sample of coal tested at Bokaro Power Supply Company laboratory, it was noted that ash content in 81 out of 86 rakes was more than 34 *per cent*. Similarly, in case of supply from Central Coalfields Limited/Kathara, Kedla and Swang, invoices (2020-21) indicated 34 *per cent* ash whereas ash content as per laboratory report at Bokaro Power Supply Company were more than 34 *per cent* in 89 out of 97 rakes.

In case of supply from Bhojudih (Bharat Coking Coal Limited) all the invoices (2020-21) indicated less than 34 *per cent* ash content. However, as per laboratory report ash content was between 35.46 *per cent* and 54.87 *per cent* in 14 out of 15 rakes.

Audit observed that though the Management was aware about the wide variance in the ash content and that the terms of agreement provided for third party sampling, no third-party sampling was done during 2016-17 to 2020-21. The third-party sampling was started only from September/October 2021. In the absence of third-party sampling, seller did not accept the test conducted at Bokaro Power Supply Company laboratory. Thus, in the absence of sampling of coal by third party, Bokaro Power Supply Company could not avail rebate of ₹ 41.38 crore[72] on excess ash content on coal supplied by Central Coalfields Limited and Bharat Coking Coal Limited as they did not accept coal analysis report conducted in the Bokaro Power Supply Company laboratory. Moreover, coal bills were continuously being paid by the Company even though ash content was not mentioned there.

Management replied (March 2022) that the analysis report of the in- house laboratory of Bokaro Power Supply Company was not recognised by any other party due to lack of accreditation. Hence, the rebate based on in-house laboratory report was not admissible. Ministry added (May 2023) that third party sampling was being done from September 2021.

The reply of the Management/Ministry establishes the fact that after deficiencies were noticed in the in-house testing, third party sampling was necessary. Third party sampling was not done

[72] ***Quantity of coal with ash content above 34 per cent multiplied with rebate of ₹7 per tonne for each 0.1 per cent increase in ash content above 34 per cent on average basis.***

and only joint sampling was carried out with Bharat Coking Coal Limited and Central Coal Supply Organisation[73]. As third party sampling was not carried out, Management was unable to claim rebate.

3.3.5.2 Extra expenditure due to supply of poor quality coal by Bharat Coking Coal Limited

Clause 5.3 of Fuel Supply Agreement with Bharat Coking Coal Limited inter-alia stipulated the seller shall make adequate arrangement to assess the quality and monitor the same to endeavour that coal having Gross Calorific Value[74] less than 2,200 kilo calorie per kg is not loaded in purchaser's containers. From review of laboratory test reports of Bokaro Power Supply Company of 2020-21, Audit noted that coal in 12 rakes out of total 63 rakes received from Jamadoba, Munidih and Bhelatand mines of Bharat Coking Coal Limited had calorific value less than 2,200 kilo calorie per kilogram. Average calorific value of coal in these rakes was 2,730 kilo calorie per kg, 3,331 kilo calorie per kg and 2,727 kilo calorie per kg respectively against average calorific value of 4,300 kilo calorie per kg for coal supplied by Central Coalfields Limited.

Audit also noted that coal from Jamadoba and Bhelatand was procured first time during the last five years. As Bokaro Power Supply Company had sufficient quantity of coal at beginning of 2020-21 (1.71 lakh tonnes) and supply from Central Coalfields Limited was 57 *per cent* only, Bokaro Power Supply Company had an option to procure more coal from Central Coalfields Limited rather than from Bharat Coking Coal Limited which had lesser calorific value. This resulted in extra expenditure of ₹10.47 crore during 2020-21 on account of poor quality of coal from these mines. Though the quality of coal was not as per specification of the Fuel Supply Agreement, the Company only intimated Central Coal Supply Organisation/SAIL who was the coal co-ordinator but did not take up the matter with higher authorities of Central Coal Supply Organisation and Bharat Coking Coal Limited. It was further noted that Memorandum of Understanding which was entered into by SAIL and Bharat Coking Coal Limited *inter alia* stipulated to carry out third party sampling which was not done.

Management replied (March 2022) that as per the Fuel Supply Agreement with Bharat Coking Coal Limited, supply of at least 60 *per cent* of the Fuel Supply Agreement quantity was mandatory. Non-fulfilment of the same would attract penalty and Bharat Coking Coal Limited might review their stance for future Fuel Supply Agreement with Bokaro Power Supply Company. Bokaro Power Supply Company had regularly corresponded regarding poor quality of coal with Central Coal Supply Organisation/SAIL which was coordinating the supply from Bharat Coking Coal Limited.

The reply of the Management may be seen in view of the fact that Bokaro Power Supply Company procured 62 *per cent* of Annual Contracted Quantity from Central Coalfields Limited in 2020-21, whereas it procured 76 *per cent* of Annual Contracted Quantity from Bharat Coking Coal Limited. As it was aware that the coal from Bharat Coking Coal Limited was of lower

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[73] ***Central Coal Supply Organisation is a unit of SAIL which coordinates supply of coal to SAIL and its Joint ventures from Central Coalfields Limited and Bharat Coking Coal Limited.***

[74] ***Calorific Value indicated the heat produced in kCal by complete combustion of one kilogram of coal.***

quality in comparison to the Central Coalfields Limited, it could have restricted the procurement of coal from Bharat Coking Coal Limited to the minimum level required (60 *per cent* of Annual Contracted Quantity) to avoid any penalty. The Chairman of the Board Committee for Finance, Accounts and Audit of Bokaro Power Supply Company also directed (July 2021) Bokaro Power Supply Company Management to conduct meeting with SAIL/ Central Coal Supply Organisation so that Bokaro Power Supply Company was not given only residual low grade coal.

Ministry replied (May 2023) that there was acute crisis in coal supply during pandemic and post Covid period. Priority was given by the Ministry to supply coal to commercial Power Sector Companies.

Reply of Management may be seen in the light of the fact that despite there being provision in the Fuel Supply Agreement with Central Coalfields Limited for import of coal, the Company did not opt for the same and rather procured lower/inferior quality of coal. Overall Coal Management was very poorly handled by the Company and consequently it ended up with coal with low calorific value, higher ash content and coal that was mixed up with stones/boulders and other extraneous material.

Recommendation 6: The Company may make effort to reduce procurement of coal having poor calorific value and high ash content and regularly monitor the quality of coal through third party sampling.

3.3.6 Safety and Environmental Issues

3.3.6.1 Safety issues

Section 88 of the Factories Act, 1948 stipulated that in case any accident occurs which causes death or any bodily injury by reason of which the person injured is prevented from working for a period of forty-eight hours or more, it should be treated as Non-Fatal –reportable accident and should be intimated to the concerned statutory authority. Bokaro Power Supply Company declared one case as reportable and 31 non-reportable during 2016-17 to 2020-21. Audit however noted that in 17 cases wherein the workers were absent from duty from 3 days to 46 days were not treated as reportable and declared as non-reportable cases. This was against the provisions of the Factories Act.

Management replied (March 2022) that 20 incidents were road accidents that occurred outside the premises of Power Plant and seven incidents were cases where injury leave was extended by Hospital and was not reported.

Reply of the Management may be viewed in the light of the fact that 17 accidents noted by Audit occurred in the plant premises of Bokaro Power Supply Company and leave of employees were more than 48 hours and were required to be reported under the provisions of Factories Act.

The Ministry added (May 2023) that Safety department had started gathering data/information from Bokaro General Hospital for such cases and such information was being provided to the Statutory bodies and Factories Act and Rules were being complied.

3.3.6.2 Non installation of fire protection system in transformer

Central Electricity Authority (Measures Relating to Safety and Electric supply) Regulation, 2010 stipulated that all the transformers of Mega Volte Ampere and above or in case of oil filled transformer with oil capacity of more than 2000 litres shall be provided with IS-3034:1993 firefighting systems or with nitrogen injection fire protection system. Bokaro Power Supply Company had 17 transformers out of which only 10 had fire protection systems till March 2022. The nitrogen injection fire protection system for remaining seven transformers were yet to be installed.

Audit noted that Central Electricity Authority raised the issue of non-installation of nitrogen injection fire protection system in February 2014, however the same was not fully complied with even after lapse of seven years. Two incidences[75] occurred in Turbo Generator 2 (October 2015) and in Generator Transformer in Turbo Generator 7 (August 2020). Turbo Generator 2 was repaired in February 2017 and taken back in operation after shutdown of 17 months. Turbo Generator 7 was out of operation till September 2021. Audit observed that due to delay in installation of fire protection system, there was non-compliance of Central Electricity Authority orders on the part of the Company. Generation of power was also affected due to the fire incidences mentioned above.

Management replied (March 2022) that commissioning of nitrogen injection fire protection system in remaining seven transformers would be done by end of 2022.

Ministry replied (May 2023) that nitrogen injection fire protection system had been installed and commissioned in all seventeen transformers as on 14 November 2022.

3.3.7 Environmental issues

3.3.7.1 Non-adherence of Ministry of Environment, Forest. and Climate Change guidelines for emission of dust and gases

Ministry of Environment, Forest and Climate Change had amended the Environment (Protection) Amendment Rules, 1986 and notified it as 'The Environment (Protection) Amendment Rules, 2015' in December 2015. The Rules specified norms of emissions of gases and dust from Power Plants i.e., (sulphur di-oxide and nitrogen oxide) and particulate matter for the Thermal Power Plants installed before December 2003 and those installed between January 2003 and December 2016. Bokaro Power Supply Company entrusted (October 2018) MECON[76] to carry out Study and prepare Feasibility Report to adhere to the norms of Ministry of Environment, Forest and Climate Change for flue gas emission limits in its power plant. MECON submitted the Feasibility Report in November 2019.

MECON carried out field test to check the various pollutants present in the flue gas and noted that parameters were beyond the limit specified by the Ministry of Environment, Forest and Climate Change. Though the sulphur di-oxide level in Boilers 2 to 5 was within the norm of 600 milligrams per cubic metre (mg/Nm^3), sulphur di-oxide level in Boilers 6 to 9 was between

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[75] ***In both cases fire occurred.***

[76] ***MECON Limited, known as Metallurgical & Engineering Consultants (India) Limited is a government owned engineering consultancy service provider under the Ministry of Steel, Government of India.***

1,227 and 1,796 milligrams per cubic metre. Nitrogen oxide level in all the boilers in operation was between 606 and 3,517 milligrams per cubic metre against the norm of 600 mg/Nm^3. Suspended Particulate Matter level in the Boilers 2 to 8 was between 161 and 207 milligrams per cubic metre against the norm of 100 milligrams per cubic metre (Suspended Particulate Matter in Boiler 6 was within the norm) whereas in Boiler 9, the level was 126 milligrams per cubic metre which was higher than its norm of 50 milligrams per cubic metre.

MECON recommended[77] (November 2019) nitrogen oxide level, Selective Non Catalyst Reduction system for Boilers 3 to 5. Regarding Boilers 6 to 9, it recommended to set up Semi Dry Flue Gas Desulphurisation system. Combination of combustion modification technology and Selective Non Catalyst Reduction System was recommended for Boiler 9.

Audit observed that though the notification issued in December 2015 was to be complied within two years, Bokaro Power Supply Company initiated the proposal in October 2018 after lapse of more than two years. The recommendation of MECON was yet to be implemented (March 2022).

Management replied (March 2022) that Ministry of Environment, Forest and Climate Change had given a time extension to the industries for implementation of Flue Gas Desulphurisation system till December 2024. Bokaro Power Supply Company had taken steps for preparation of Technical Specifications for installation of Flue Gas Desulphurisation system in Boilers 6 to 9.

Ministry stated (May 2023) that NTPC consultancy wing was engaged as Project Management Consultant for the project in March 2021. NTPC had submitted detailed project report wherein setting up of Wet type Flue gas Desulphurisation system for Boilers 6 to 9 was recommended instead of Semi Dry type Flue gas Desulphurisation systems recommended by MECON earlier. The tender specifications were being prepared by NTPC.

The reply of the Management/Ministry may be seen in the light of the fact that even after a lapse of seven years from date of notification issued in December 2015 and a lapse of three years since recommendation of MECON, direction given by Ministry of Environment, Forest and Climate Change was not complied with. The Management was yet to float tender enquiry to setup Wet type Flue gas Desulphurisation system as recommended by NTPC in November 2022. As such, while Ministry of Environment, Forest and Climate Change has given extension, the fact remained that hazardous gases were emitted above the environmental norms thereby posing threat to human life nearby.

Recommendation 7: Bokaro Power Supply Company may make all efforts to set up the Wet type Flue Gas Desulphurisation system as recommended by the consultant relating to emission of various gases to avoid any penalty from Ministry of Environment, Forest & Climate Change.

[77] ***Boiler 1 was not in use since November 2016. MECON stated that Boiler 2 met the new norm and accordingly they did not recommend for Boiler 2.***

3.3.7.2: Non-compliance of directions issued by Ministry of Environment and Forest relating to disposal of fly ash

Ministry of Environment and Forest issued notification (September 1999) for disposal of ash generated from all coal based thermal power stations to achieve target of 100 *per cent* fly ash utilisation within five years. The notification was amended in 2003, 2009, 2016 and latest in April 2021 and December 2021. As per the notification, all coal based thermal power plants shall, within a radius of 300 kilometres, bear the cost of transportation of ash to the site of road construction. As per amendment made in December 2021, every coal based thermal power plant shall be responsible to utilise 100 *per cent* ash (fly ash and bottom ash) generated during that year.

Further, in case of unutilised accumulated ash i.e., legacy ash, shall be utilised progressively by the Thermal Power Plants in such a manner that the utilisation of legacy ash shall be completed fully within 10 years (1st year – at least 20 *per cent*, 2nd year at least 35 *per cent* and 3rd to 10th year at least 50 *per cent*) from 1 April 2022 otherwise a fine of ₹1000 per tonne of unutilised legacy ash during that financial year will be imposed.

Figure 3.4: Ash Pond

Audit noted that total 28.95 lakh cubic metres of ash was generated by Bokaro Power Supply Company during 2016-17 to 2020-21. However, 33.55 lakh cubic metre of ash was utilised by the Company during the above period. Audit observed that the Company utilised mostly the current generated ash and disposal of legacy ash accumulated over the years was very slow. This was evident from the fact that there was accumulation of 31.80 lakh cubic metre of legacy ash as on 31 March 2021.

Further, National Highway Authority of India requested (October 2019) for supply of 19.96 lakh cubic metre of pond ash for road construction, however, Bokaro Power Supply Company could supply only 1.71 lakh cubic metre of ash (8.56 *per cent*) to National Highway Authority of India till October 2020.

Management replied (March 2022) that ash utilisation was more than the ash generated during last five years. Bokaro Power Supply Company was constantly exploring new avenues to increase the ash utilisation. Major concern in ash utilisation was continuous agitation by local villagers against execution of the work which affected the disposal of ash. Management also stated that NHAI did not lift the ash.

Ministry replied (May 2023) that Bokaro Power Supply Company Limited was in the course of utilisation of legacy ash as per the guidelines of Ministry of Environment, Forest and Climate Change.

The reply of the Management may be seen in the light of the fact that only freshly generated ash was being disposed off and legacy ash were not utilised adequately. Agitation of local villagers is an administrative issue which should be taken care of by the Management. The reply of Ministry may be seen in the light of the fact that there was an accumulation of 29.77 lakh cubic metres of legacy ash as on 31 March 2023, which was yet to be disposed off.

Recommendation 8: Bokaro Power Supply Company may make all efforts to utilise/dispose the legacy ash in order to comply with the notification of Ministry of Environment, Forest & Climate Change. The matter of utilisation of pond ash for road construction may also be actively followed up with NHAI.

3.3.8 Conclusion

Bokaro Power Supply Company Limited was formed as a Joint venture of SAIL and Damodar Valley Corporation to operate as a captive power plant to supply steam and power to Bokaro Steel Plant. However, it could achieve production ranging between 68 *per cent* and 90 *per cent* of the annual requirement of Bokaro Steel Plant during 2016-17 to 2018-19. Consequently, Bokaro Steel Plant reduced the demand of power from Bokaro Power Supply Company Limited from 210 Megawatt in 2018-19 to 175 Megawatt in 2019-20 and further reduced it to 134 Megawatt in 2020-21. Bokaro Steel Plant instead procured more power from Damodar Valley Corporation.

Audit noted that the major reasons for the inability of Bokaro Power Supply Company Limited to achieve its planned production/requirement of Bokaro Steel Plant was low performance of its boilers and turbo generators, lack of repair and maintenance and the failure of the Company to implement all the recommendations of the Energy Audit. Due to high percentage of un-burnt carbon in the fly and bottom ash against norms, the Company was also not able to utilise 2.69 lakh tonnes of unburnt carbon equivalent to coal valuing ₹284.41 crore. Management also failed to implement various projects like replacement/augmentation of boilers, replacement of steam pipelines, solar power units that were envisaged to improve its performance.

Bokaro Power Supply Company Limited could not achieve the norms of Central Electricity Regulatory Commission in respect of operational parameters like plant load factor, consumption of steam, station heat rate etc. Company was not able to operate at minimum Plant Load Factor based on the total requirement of Bokaro Steel Plant which resulted in shortfall in generation of 1,398 million units of power during 2016-17 to 2020-21and loss of profit margin of ₹49.47 crore. Excess consumption of steam beyond the norms resulted in loss of generation of power by 236.52 million units with profit margin of ₹ 8.36 crore.

Several issues were also noted with respect to Coal Management. It procured lower quality of coal from Bharat Coking Coal Limited even though there was scope of procurement of superior quality of coal from Central Coalfields Limited which resulted in extra expenditure of ₹10.47 crore during 2020-21. Bokaro Power Supply Company could not avail rebate of ₹41.38 crore

on excess ash content from Central Coalfields Limited and Bharat Coking Coal Limited in absence of third party sampling.

Lapses were also noted in respect of safety and environment related issues. The Company did not implement the instructions of Ministry of Environment, Forest and Climate Change regarding emissions of dust and gases from power plants.

Bokaro Power Supply Company Limited being a captive power plant of SAIL, needs to operate efficiently, economically and effectively and minimise the dependency of SAIL on power from other sources.

New Delhi
Dated: 11 July 2023

(R.G. Viswanathan)
Deputy Comptroller and Auditor General and Chairman, Audit Board

Countersigned

New Delhi
Dated: 13 July 2023

(Girish Chandra Murmu)
Comptroller and Auditor General of India

Annexures

Annexure I

Statement showing calculation for the amount of due to be recovered from M/s Punj Lloyd
(*Referred to in paragraph 1.2.1.3)*

Particulars	**Formula**	**Amount**
Final bill (80th RA) for work done value	A	₹ 16,196,702
12th Escalation bill	B	₹ 52,982,838
Other Payable	C	₹ 6,518,305
Total Payable	**D=(A+B+C)**	**₹ 75,697,845**
Recovery towards non deployment of Machinery	E	₹ 21,894,500
Inadequacy of Test results of Geo-grid	F	₹ 36,051,126
Security Deposit for Defect Liability Period	G	₹ 100,000,000
Liquidity Damage imposed by AAI	H	₹ 264,290,000
Interest for non-submission of BG	I	₹ 11,597,222
Other Recoveries	J	₹ 1,064,209
Total Recoveries	**K=(E+F+G+H+I+J)**	**₹ 434,897,057**
Recoveries to be made	**L=(K-D)**	**₹ 359,199,212**
Less - Security deposit	**M**	**₹ 100,000,000**
Net Recoveries		**₹ 259,199,212**

Annexure-II

Statement showing calculation of Runway length correction of Q-400 aircraft at Pakyong Airport

(Referred to in paragraph 1.2.2.2)

Runway take-off length for Q-400	**1300 m**
Runway take-off length corrected for elevation	(1300 X 0.07 X (1416 /300) + 1300) 1729.520 m
Runway take-off length corrected for elevation and temperature	(1729.520 X (30.02 -5.796) X 0.01) + 1729.520 2148.479 m
Runway take-off length corrected for elevation, temperature and slope	(2148.479 X 0.5 X 0.10) +2148.479 = 2255.903 m = 2260 m (say)
Elevation of Pakyong airport	1416 m
Reference Temperature at Pakyong airport	30.02 degree C
Longitudinal slope-runway (avg.)	0.5%
Temperature in the standard atmosphere at sea level	15 degree C
Temperature in the standard atmosphere for 1416 m	(15 – (6.5 X 1416 / 1000)) 5.796 degree C

Annexure-III

Statement showing details of contracts selected in sampling
(Referred in para 2.1.8)

S. No	Contract/work order no/date	Particulars of contracts/ work order	Name of contractor/ vendor	Awarded value of contract/ work order (₹ *in* lakh)
1	Nepa/Proj/1309/15-16 dated 18.09.2015	Civil & Structural Work of Revival and Mill Development Plan	M/s Capital Construction Pvt. Ltd., Indore	1,883.08
2	PROJ/1304/2015 dated 18.03.2016	PEB work for De-Inking Plant & Raw Material Storage	M/s Everest Industry Limited	499.18
3	Proj/5523/651 dated 18.01.2019	Procurement of PPC Cement	M/s Jai Corporation	62.00
4	Nepa/Proj/1308-1 dated 30.10.2015	Procurement of Reinforcement Steel	M/s Jindal Steel Pvt. Ltd.	659.25
5	Proj/1318/5525/18-19 dated 05.03.2019	Procurement of Structural Steel	M/s Sitaram Ganeshmall	183.43
6	Nepa/Proj/5546/20-21 dated 22.08.2020	Procurement of Structural Steel	M/s Sitaram Ganeshmall	57.95
7	NEPA/1313/2017-18 dated 02.05.2017	Structural Audit & NDT Testing	M/s Global Engineers Services	9.84
8	NEPA/Proj/1317 dated 10.05.2019	Construction of New Ash Pond	M/s Neelkantham System Pvt. Ltd.	645.46
9	Proj/2013-1/369 dated 30.05.2019	Construction of 80 m height RCC chimney	M/s Slipco	233.65
10	Project/1321/19-20 dated 13.08.2019	RCC dismantling in Paper Machine area	M/s B.S. Rajput	33.69
11	Proj/903/2015 dated 29.07.2015	Refurbishment/ modification of stock preparation, approach flow, broke handling system, fiber recovery, Paper Machines with auxiliaries, its erection, commissioning and Performance Guarantee run	M/s PAPCEL, Czech Republic	11,563.08

S. No	Contract/work order no/date	Particulars of contracts/ work order	Name of contractor/ vendor	Awarded value of contract/ work order (₹ *in* lakh)
12	Proj/908/2016 dated 31.08.2016	Refurbishment of Existing Rewinders For Paper Machine-1 & New Rewinder for Paper Machine-2	M/s PAPCEL a.s., Czech Republic	2,894.57
13	Proj/815/5528/2019-20 dated 11.01.2019	Additional Erection Items for Mech	M/s Siddhivinayak Steel Mumbai	247.05
14	TCE-7295A-C-690-001/NEPA/RMDP/ETP/Proj.1404	Effluent Treatment Plant (ETP)	Arvind Envisol	2,247.00
15		Repairing of ETP Transformer	M/s Power Batteries	5.94
16	TCE7295A-C300-001/NEPA/RMDP/DIP/05	De-Inking Plant	M/s Andritz	4,171.76
17		CHA & Logistics	M/s Boxco Logistics	283.95
18		Third Party Inspection	M/s SGS	1.12
19	PROJ/819 dated 24.06.2019	Fire Fighting	M/s Extinct, Mumbai	310.00
20	Proj/2004/2016 dated 10.09.2016	12.27 MW Captive Power Plant (CPP)	M/s Sitson	5,191.00
21	Proj/CPP/ADD. MECH./2013/2019 Dated 12.07.2019	CPP Additional Boiler Mechanical	M/s Sitson	138.00
22	Proj/925/2019-20 dated 06.06.2020	Vaccum Pumps for Paper Machine-2	M/s PPI Pumps Pvt Ltd. Ahmedabad	182.23
23	Proj/1204/132 KV Substation/03 dated 28.11.2015	Supply of 132/6.9 KV Substation	M/s Asiatic Traders	307.97
24	Proj/1204/132 KV Substation dated 15.11.2019	Additional Budget for 12.5 MVA Transformer	M/s Royal Electrical Works, Kalyan	157.53
25	AE/2016-17/50 dated 13.05.2016	Shifting of 33 KV line -1 (P/H)	M/s MPPKVVCL, Indore	60.00
26	Proj/3007/2013 dated 27.11.2013	Geotechnical investigation - Work of Factory Premises	M/s DBM Geotechics & Construction Pvt. Ltd-Mumbai	9.55

S. No	Contract/work order no/date	Particulars of contracts/ work order	Name of contractor/ vendor	Awarded value of contract/ work order (₹ *in* lakh)
27	LOI No. Proj/1301 dated 06.12.2013	Project Management consultancy services for RMDP	M/s TCE, Mumbai	917.49
28	P.O. 6006	Search Report of M/s Cathar Ltd	Jasbil & Company, New Delhi	0.07
29	Proj/5505_1/15-16 dated 23.02.2016	Rotary with Carbon Rings	M/s Marko Steamjet Pvt. Ltd.	6.92
Total				**32,962.76**

Annexure-IV
Statement showing changes in scope of work under tenders of Revival and Mill Development Plan
(*Referred in para 2.2.1.2*)

Sr. No	Name of major activity	Awarded cost (₹ in crore)	Revised cost (₹ in crore)	Difference (₹ in crore)
1	300 Bone Dry Tonne Per Day De-Inking Plant (Civil works)	12.06	23.83	11.77
2	Renovation of Paper Machines	103.82	107.80	3.98
3	Renovation of 12.27 MW Captive Power Plant	49.34	51.91	2.57
4	300 Bone Dry Tonne Per Day De-Inking Plant (Erection works)	Fresh tender	2.47	2.47
			Total	**20.79**

Annexure-V

Statement showing estimated cost and actual awarded cost of various works under Revival and Mill Development Plan

***(Referred in para 2.2*.1.2)**

(₹ in crore)

S. No.	Particulars of work	Estimated Cost	Revised Estimated cost	Awarded Cost	Revised awarded cost
1.	Refurbishment/ modification of stock preparation, approach flow, broke handling system, fiber recovery, Paper Machines with auxiliaries, its erection, commissioning and Performance Guarantee run	41.30	78.07	103.82	107.80
2.	Refurbishment and R&M of 12.27 MW cogen power plant & Auxiliaries on lump sum basis excluding civil works	20.00	38.00	49.34	51.91
3.	Design, Engineering, Construction, Manufacture, Assembly, Test at Manufacturers Works, Supply, Refurbishment of existing Equipment, Erection, Commissioning and Performance Acceptance Test and onsite training of Sludge Handling System (Package-1) and Effluent Treatment Plant (Package-2)	27.00	--	22.47	--
4.	Pre-Engineered building works for construction of proposed 300 Bone Dry Tonnes Per Day De-Inking Plant Building, Raw Material Storage (RMS) warehouse under Revival and Mill Development Plan	6.00	--	4.59	4.99
5.	Refurbishment of existing Rewinder for Paper Machine-1 and new Rewinder for Paper Machine-2	23.00	--	27.10	28.95
6.	Reel Wrapping System	10.40	--	6.14	--
	Total	**127.70**		**213.46**	

Annexure-VI

Statement showing time taken by the Project Management Consultant (PMC) in evaluation of bids and issue of Letters of Intent

(Referred to in paragraph 2.2.1.2)

S.No.	Tender No.	Actual date of opening of Part-I of the tender	Date of recommendation by PMC	Time taken by PMC for technical evaluation of bid (in days)	Date of Opening of Part-II (Price Bid) of the tender	Time Taken for opening of Price bid (in days)	Date of issue of LoI	Time taken in issue of LoI (in days)	Date of execution of contract
1	TCE-7295A-C-510-002/Nepa/RMDP/CPP/08	28.04.2014	17.03.2016	689	24.05.2016	757	30.06.2016	794	10.09.2016
2	TCE 7295A-C 310-001/Nepa/RMDP/PM/09	28.11.2014	05.03.2015	97	11.03.2015	103	25.06.2015	209	29.07.2015
3	TCE 7295A-C 300-001/Nepa/RMDP/DIP/05	07.02.2014	20.05.2014	102	30.05.2014	112	02.07.2014	145	14.11.2014
4	NEPA/RMDP/Rewinder/20	13.01.2016	01.04.2016	79	12.04.2016	90	21.07.2016	190	31.08.2016
5	NEPA/RMDP/812	30.11.2016	21.03.2017	111	24.04.2017	145	16.01.2019	777	31.01.2019
6	TCE-7295A-C-690-001/NEPA/RMDP/ETP/PROJ1404	30.11.2016	01.03.2017	91	24.04.2017	145	26.02.2019	818	NA