BEFORE THE HON'BLE CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

PETITION NO……

IN THE MATTER OF : Petition Under Section 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-III of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 and Chapter-3, Regulation-9 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for approval of tariff of Barauni Thermal Power Station Stage-II (2x250 MW) for the period from 01.04.2024 to 31.03.2029.

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Summary of Issues

Determination of Tariff of Barauni-II (2X250 MW) for 2024-29 Period

I. CONSPECTUS:

- Instant Petition is filed under Section 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-III of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 and Chapter-3, Regulation-9 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for approval of tariff of **Barauni Thermal Power Station Stage-II (2x250 MW) for the period from 01.04.2024 to 31.03.2029.**
- Barauni-II Station comprises of two units of 250 MW each. Unit#1 was declared Commercial on 01.03.2020, and Unit#2 on 01.11.2021. The petitioner vide affidavit dated 07.03.2023 had filed petition (120/GT/2023) for approval of tariff of Barauni-II (2x250 MW) on the actual capital cost on COD of U#9. Pursuant to the directions of Hon'ble Commission, amended petition was filed based on actual capital cost as on COD of U#8 i.e. 01.03.2020 and as on COD of U#9 i.e. 01.11.2021 and the projected estimated additional capital expenditure for the period upto 31.03.2024, the tariff for the same is yet to be determined by the Hon'ble Commission. The petitioner vide affidavit dated 29.11.2024 had filed a separate true up petition for the period from U#9 COD i.e. 01.11.2021 to 31.03.2024 for revision of tariff for Barauni-II after truing up exercise in line with the applicable provisions of Tariff Regulations 2019.

II. ISSUES FOR CONSIDERATION:

Capital Cost: It is submitted that the tariff for Barauni-II for the period 01.03.2020 to 31.3.2024 in aforesaid petition no. 120/GT/2023 and its true up petition is under kind consideration of Hon'ble Commission and is yet to

be determined. In absence of order of main tariff petition for 2019-24, the actual closing capital cost as on 31.03.2024 has been worked out in the aforesaid true-up petition as Rs 303826.15 Lakh based on the actual expenditure after truing up exercise for the period 2019-24. Accordingly, in the instant petition, the opening capital cost (Rs 303826.15 Lakhs) as on 01.04.2024 has been considered same as closing capital cost as on 31.03.2024.

(a) The tariff of instant station for 2024-29 period has been worked out based on opening capital cost as on 01.04.2024 arrived as above and projected additional capital expenditure (Add Cap) for 2024-29 period. The detail of projected add cap year wise is provided in Form-9 of the Tariff forms attached as **Appendix-I.**

(b) **Claim of water charges, Capital Spares Consumption & security expenses:**

i. **Water Charges:** Water charges are claimed based on projected expenditure towards water charges and provided in Form-3A of Appendix-I.

ii. **Capital Spares Consumption:** The details of year-wise actual capital spares consumption is not provided at the instant petition. The same shall be provided at the time of true-up in terms of the proviso to the Regulation 36(1)(6) based on actual consumption of spares during the period 2024-29.

iii. **Security expenses:** Security expenses are claimed based on estimated expenditure to be incurred towards deployment of CISF

personnel/security personnel for safety and security according to security threat perception, survey and as per the guidelines of Ministry of Home Affairs. The estimated security expenses year wise is provided in Form-3A of the Appendix-I.

iv. **Ash Transportation Charges:** Hon'ble Commission vide its order dated 28.10.2022 in petition no 205/MP/2021 allowed the Ash transportation expenses for FY 2019-20, 2020-21, and 2021-22 and further allowed the monthly billing of ash transportation charges for 2022-23 and 23-24 period. Presently, the details of Ash transportation charges is not provided at the instant petition, same shall be provided later or at the time of true-up. To avoid the interest payment liability of the beneficiaries, it is prayed that the petitioner may be allowed to recover/ pass on the ash transportation charges on a monthly basis subject to true-up at the end of the 2024-29 period..

(c) **Filing and Publication Expenses:** Petitioner has claimed the Filing and Publication expenses as per Regulation, 94 of Tariff Regulations, 2024.

(d) Petitioner has also prayed for considering station heat rate based on design heat rate with applicable operating margin as detailed in the petition and to allow the works beyond cut-off date for the instant station under Regulation-102 of CERC Tariff Regulations 2024 i.e. Power to relax.

(e) **Liberty to approach Commission for Pay Revision:** It is submitted that the pay/wage revision for the employees of the Petitioner will be due wef 01.01.2027. Further, the wage/pay revision of CISF and Kendriya Vidyalaya

employees will also be due for revision during the tariff period 2024-29. In view of the above, Petitioner seeks liberty to approach the Hon'ble Commission for allowing the impact of Pay/wage revision of employees of the Petitioner and personnel of CISF and Kendriya Vidyalaya as applicable.

III. ANNUAL FIXED CHARGES CLAIMED:

The detail of Annual Fixed Charges are provided at **Appendix-I**.

IV. Prayer

In the light of the above submissions, the Petitioner, therefore, prays that the Hon'ble Commission may be pleased to:

i) Approve tariff of Barauni Thermal Power Station Stage-II (2x250 MW) for the tariff period 01.04.2024 to 31.03.2029.

ii) Allow the recovery of filing fees as & when paid to the Hon'ble Commission and publication expenses from the beneficiaries.

iii) Allow the work beyond cut-off date for the instant station under Regulation-102 of CERC Tariff Regulations 2024 i.e. Power to relax.

iv) Consider Station Heat Rate based on design heat Rate with applicable operating margin.

v) Allow reimbursement of Ash Transportation Charges directly from the beneficiaries on monthly basis, subject to true up.

vi) Grant liberty to approach the Hon'ble Commission to allow for the recovery of pay/wage revision due in 2024-29 period as additional O&M over and above the normative O&M.

vii) Pass any other order as it may deem fit in the circumstances mentioned above.

BEFORE THE HON'BLE CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

PETITION NO……

IN THE MATTER OF : Petition Under Section 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-III of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 and Chapter-3, Regulation-9 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for approval of tariff of Barauni Thermal Power Station Stage-II (2x250 MW) for the period from 01.04.2024 to 31.03.2029.

AND
IN THE MATTER OF

Petitioner: : NTPC Ltd.
NTPC Bhawan
Core-7, Scope Complex
7, Institutional Area, Lodhi Road
New Delhi-110 003.

Respondents

1	North Bihar Power Distribution Company Ltd (NBPDCL), Vidyut Bhawan, Bailey Road Patna- 800021
2	South Bihar Power Distribution Company Ltd (SBPDCL), Vidyut Bhawan, Bailey Road Patna- 800021

The Petitioner humbly states that:

1) The Petitioner herein NTPC Ltd. (hereinafter referred to as 'Petitioner' or 'NTPC'), is a company incorporated under provisions of the Company Act, 1956 and a Government Company as defined under Section 2(45) of the Companies Act, 2013. Further, NTPC is a 'Generating Company' as defined under Section 2(28) of the Electricity Act, 2003.

2) In terms of Section 79(1)(a) of Electricity Act, 2003, the Hon'ble Commission has been vested with the functions to regulate the tariff of NTPC, being a Generating Company owned and controlled by the Central Government. The regulation of the tariff of NTPC is as provided under Section 79(1)(a) read with Section 61, 62 and 64 of the Electricity Act, 2003 and the Regulations notified by the Hon'ble Commission in exercise of powers under Section 178 read with Section 61 of the Electricity Act, 2003.

3) The Petitioner is having power stations/ projects at different regions and places in the country. Barauni Thermal Power Station, Stage-II (2x250 MW) (hereinafter referred to as Barauni-II) is one such station located in the State of Bihar. The power generated from Barauni-II is being supplied to the respondents herein above

4) The Barauni Thermal Power Station Stage-II was previously owned by Bihar State Power Generating Company Ltd (BSPGCL). The assets of Barauni TPS Stage-II were transferred and vested with NTPC, by the Government of Bihar (GoB) in accordance with the "The Bihar Power Generation Undertakings Transfer Scheme, 2018", (hereinafter called 'Transfer Scheme'), vide notification dated 27.06.2018. However, in partial modification of the above notification, Govt. of Bihar has finally notified vide no.11 dated 14.12.2018 effective date of transfer of Barauni Thermal power station (Stage-I & Stage-II) to NTPC from BSPGCL to be 15.12.2018. Based on above, the assets of Barauni TPS Stage-II have been taken over by NTPC w.e.f. 15.12.2018. Copy of the said Transfer Scheme and Notification dated 27.06.2018 &14.12.2018 respectively is attached as Annexure-A. Further, Ministry of Power, Government of India vide letter dated 21.06.2018 has allocated 100% power from 2x250MW Units of Barauni TPS Stage-II to Bihar (A copy of the allocation letter is attached at Annexure-B).

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5) The Hon'ble Commission has notified the Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2024 (hereinafter 'Tariff Regulations 2024') which came into force from 01.04.2024, specifying the terms & conditions and methodology of tariff determination for the period 01.04.2024 to 31.03.2029.

6) Regulation 9(2) of Tariff Regulations 2024 provides as follows:

> *"(2) In case of an existing generating station or unit thereof, or transmission system or element thereof, the application shall be made by the generating company or the transmission licensee, as the case may be, by 30.11.2024 , based on admitted capital cost including additional capital expenditure already admitted and incurred up to 31.3.2024 (either based on actual or projected additional capital expenditure) and estimated additional capital expenditure for the respective years of the tariff period 2024-29 along with the true up petition for the period 2019-24 in accordance with the CERC (Terms and Conditions of Tariff) Regulations, 2019."*
>
> In terms of above, the Petitioner is filing the present petition for determination of tariff for Barauni-II for the period from 01.04.2024 to 31.03.2029 as per the Tariff Regulations 2024.

7) The Barauni-II project comprising of two units of 250 MW each. Unit#1 was declared Commercial on 01.03.2020 and Unit#2 on 01.11.2021. The petitioner vide affidavit dated 07.03.2023 had filed petition (120/GT/2023) for approval of tariff of Barauni-II (2x250 MW) on the actual capital cost on COD of U#9. Pursuant to the directions of Hon'ble Commission, amended petition was filed based on actual capital cost as on COD of U#8 i.e. 01.03.2020 and as on COD of U#9 i.e. 01.11.2021 and the projected estimated additional capital expenditure for the period upto 31.03.2024, the tariff for the same is yet to be determined by the Hon'ble Commission. The petitioner vide affidavit dated 29.11.2024 had filed a separate true up petition for the period from U#9 COD i.e.

01.11.2021 to 31.03.2024 for revision of tariff for Barauni-II after truing up exercise in line with the applicable provisions of Tariff Regulations 2019.

8) It is submitted that the tariff for Barauni-II for the period 01.03.2020 to 31.3.2024 in aforesaid petition no. 120/GT/2023 and its true up petition is under kind consideration of Hon'ble Commission and is yet to be determined. In absence of order of main tariff petition for 2019-24, the actual closing capital cost as on 31.03.2024 has been worked out in the aforesaid true-up petition as Rs 3,03,826.15 Lakh based on the actual expenditure after truing up exercise for the period 2019-24. Accordingly, in the instant petition, the opening capital cost (Rs 303826.15 Lakhs) as on 01.04.2024 has been considered same as closing capital cost as on 31.03.2024. Hon'ble Commission may be pleased to accordingly adopt this in the admitted capital cost as on 31.3.2024 and determine the tariff in the present petition for the period 2024-29.

9) The capital cost claimed in the instant petition is based on the opening capital cost as on 01.04.2024 considered as above and projected estimated capital expenditures claimed for the period 2024-29 under Regulation 19 and Regulation 24, 25 and 26 of the Tariff Regulations, 2024.

10) The Petitioner further respectfully submits that as per Regulation 36(1)(6) of the Tariff Regulations 2024, the water charges, security expenses, ash transportation expenses and capital spares consumed for thermal generating stations are to be allowed separately. The details in respect of water charges such as type of cooling water system, water consumption, rate of water charges as applicable for 2023-24 have been furnished below. Water charges claimed is based on projection basis and same may be allowed in tariff based on the same for 2024-29.In accordance with provision of the Regulations, the petitioner shall be furnishing the details of actual for the relevant year at the time of truing up and the same shall be subject to retrospective adjustment.

Description	Remarks
Type of Plant	Coal based station
Type of cooling water system	Closed Cycle with IDCT

Rate of Water charges	Water Charges: Rs 18 per Thousand gallon
Total Water Charges	Projected water charges furnished in the Form-3A of Appendix-1A.

11) Similarly, the Petitioner is claiming the security & ash transportation expenses based on the estimated expenses for the period 2024-29, the same shall be subject to retrospective adjustment based on actuals at the time of truing up. In respect of capital spares consumption, it is submitted that the same shall be claimed at the time of true-up in terms of the proviso to the Regulation 36(1)(6) based on actual consumption of spares during the period 2024-29.

12) However, it is submitted that the expenditure towards the ash transportation charges is recurring in nature and the Petitioner has been incurring ash transportation expenditure in its stations in the current tariff period also. In case the same is permitted to be recovered after the issuance of the tariff order for the period 2024-29, there will be additional liability on the beneficiary on account of the interest payment for the period till the time the tariff petitions for the period 2024-29 is decided. It is further submitted that ash transportation charges have not been presently claimed by the petitioner in the instant station for 2024-29 period. However, the petitioner craves for liberty from the Hon'ble Commission that the instant station may be allowed to recover/pass on the ash transportation charges on a monthly basis subject to true-up if any ash transportation and other related charges arises in 2024-29.

13) The petitioner humbly submits that petition no. 227/MP/2024 has been filed by the petitioner concerning Ash Transport Expenditure for its stations which is under active consideration of this Hon'ble Commission and the outcome of the said petition will be applicable to the instant petition also.

14) It is submitted that Hon'ble Commission has prescribed boiler efficiency and turbine heat rate separately for deriving the unit heat rate where the Unit Heat Rate is not guaranteed by the suppliers. It is submitted that the instant station is taken over project w.e.f. 15.12.2018. BSPGCL, who was the owner of the plant before 15.12.2018, had envisaged this project during the period 2004-09 and equipment including SG and TG specifications

for tendering / award may have been specified by the BSPGCL based on norms as specified by Bihar Electricity Regulatory Commission at that time. It was not possible for NTPC/ BSPGCL to specify the efficiency parameters at the time of finalizing the contracts on the instant station as per the efficiency parameters specified in Tariff Regulations 2024-29 which are more stringent.

In a similar case, Hon'ble Commission in its order dated 20.02.2014 in Petition No. 160/GT/2012 has considered the design parameters for computing Gross Heat Rate of the station with appropriate operating margin and has stated as under:

Quote

"161. As per the guaranteed turbine cycle heat rate of 1945 kCal/kWh and boiler efficiency of 88.5% along with the deviation of 6.5 % as per the 2009 Tariff Regulations, the Gross Heat Rate works out to 2340.59 kcal/kWh. Without the margin of Auxiliary consumption of 6.5%, the Gross Heat Rate works out as 2197.74 kcal/kWh. In light of this, achieving a GSHR of 2220 kcal/kWh as per submission of the respondents 1 to 6 is not possible. Also, the EPC contract was finalized in 2006 and there was no possibility for the petitioner to specify the Station Heat Rate as per the 2009 Tariff Regulations. In view of above, we consider a GSHR of 2340.59 kCal/kWh based on guaranteed turbine cycle heat rate 1945 kCal/kWh and boiler efficiency of 88.5% with a deviation of 6.5 % from the guaranteed design value."

UNQUOTE

Further, Hon'ble Commission vide its order dated 21.04.2022 in petition no 362/GT/2020 while determining tariff of Kahalgaon STPS-II of NTPC Limited has relaxed the boiler efficiency for computing Gross Heat Rate of the station with appropriate operating margin. The same is quoted below:

Quote

"157. Accordingly, the Commission considered the SHR of 2425 kCal /kWh as approved for 2009-14 tariff period and in exercise of Power to Relax under Regulation 54 and Power to Remove Difficulty under Regulations 55 of Tariff Regulations, 2014 allowed boiler efficiency of the units of the generating station below 0.85 for the period 2014–19"

UNQUOTE

15) Further, if the BSPGCL had stipulated more stringent unit heat rate this would have increased the capital cost commensurate to the efficiency parameters sought. The benefit

of the lower capital cost due to lower efficiency parameters has already been passed onto the beneficiaries in terms of lower capital cost. If now the boiler efficiency for working out the normative heat rate is considered as 86% instead of the actual design efficiency of 85.6% the unit heat rate would be worked out to be 2377.27 kcal/kwh and the operating margin available over the design heat rate would be ~4.5% only which is less than the operating margin of 5% allowed for 200-300 MW units in the Tariff Regulations 2024. Moreover, it is submitted that boiler efficiency is largely a function of coal quality and the boiler parameters was designed/ order based on the coal quality envisaged from Badam Coal Mine. In view of above submissions, it is prayed that Gross Station Heat rate may be allowed based on guaranteed turbine cycle heat rate of 1947.1 Kcal/Kwh (attached at Annexure-D) and design boiler efficiency of 85.6% with an operating margin of 5 % from the guaranteed design value..The tariff computation attached at Appendix-I is based on considering Station Heat Rate as per design heat rate with applicable operating margin of 5%.

16) It is submitted that in terms of Regulation 60 (5) of the Tariff Regulations 2024, the Petitioner is required to furnish details qua providing the details of Landed Price & Gross Calorific Value ("GCV") of coal in Form 15. It is further submitted that the Petitioner in terms of Regulation 40 of the Tariff Regulations 2019 was required to furnish the details for Landed Price & GCV of coal also as per Form 15 of the Tariff Regulations, 2019.

17) However, in so far as the present Petition is concerned, the Petitioner has prepared & submitted the data of coal as per Form 15 of the Tariff Regulations, 2019. The same is because of the following reasons:-

(a) This Hon'ble Commission had notified the Tariff Regulations, 2019 on 07.03.2019 and the same was in effect till 31.03.2024.

(b) The Petitioner being a diligent utility has been seamlessly providing the said data of coal in terms of the prescribed format (i.e. Form 15 of Annexure-I (Part I)) of the Tariff Regulations, 2019 to this Hon'ble Commission for computation of Interest on Working Capital.

(c) Thereafter, this Hon'ble Commission on 15.03.2024 notified the Tariff Regulations, 2024, wherein the format of Form 15 was changed/ amended by this Hon'ble Commission and a new format was placed in the Tariff Regulations 2024 in the month of June'2024.

(d) By virtue of the said change, the Petitioner has been obligated to furnish the data of coal for its existing plants month wise for the preceding 12 months i.e. for FY 2023-24 for computation of Interest on Working Capital.

18) It is humbly submitted that by virtue of the Tariff Regulations, 2024, this Hon'ble Commission has added a new format/ revised the format of Form-15 which has not prescribed in the past Tariff Regulations i.e. of 2019. Hence, it is only now (in the Tariff Regulations 2024) that the Petitioner has been obligated to furnish the data of coal as per the new format of Form-15.

A True copy of the Form 15 of Tariff Regulations 2019 and Form 15 of Tariff Regulations 2024, is marked and annexed herewith as Annexure C.

19) It is respectfully submitted that since the format for Form 15 has been changed in Tariff Regulations, 2024 and was notified in the month of June'2024, the Petitioner could not have been aware about the said changes earlier, hence the Petitioner did not maintain the data required in new format of Form 15 of Tariff Regulations, 2024.

20) Therefore, this Hon'ble Commission may kindly exempt the Petitioner from furnishing the data of coal in terms of new format of Form 15 of the Tariff Regulations, 2024 & may be allowed to furnish the details of coal for FY 2023-24 in terms of the prescribed format of Form-15 of the Tariff Regulations, 2019.

21) In light of the above submissions, it may kindly be noted that no prejudice shall be caused to any party if the Petitioner is allowed for providing the details of Landed Price & GCV of coal to this Hon'ble Commission in terms of Form 15 of the Tariff Regulations, 2019 as the value of Landed Price & GCV of coal will remains unaffected.

22) The present petition is filed on the basis of norms specified in the Tariff Regulations 2024. It is submitted that the petitioner has installed / envisaged the Emission Control Systems (ECS) in compliance of the Revised Emission Standards as notified by MOEF vide notification dated 07.12.2015 as amended. The Completion of these schemes in compliance of revised emission norms will affect the Station APC, Heat Rate, O&M expenses, water charges etc. In addition, the availability of the unit/ station would be also affected due to shutdown of the units for installation of ECS. The Combustion Modification System (Nox) of Emission Control System (ECS) is part of original scope and same has been installed and commissioned in Unit-1 & Unit-2 of instant station in FY 22-23 and FY 23-24 respectively. Accordingly, the petitioner has claimed Additional O&M expenses in instant petition. Hon'ble commission may pleased to allow the same. Further, the petitioner respectfully craves this Hon'ble Commission to grant liberty to approach Hon'ble commission on the implementation of FGD/ ECS scheme in terms of the Tariff Regulations 2024.

23) The petitioner has accordingly calculated the tariff for 2024-29 period based on the above and the same is enclosed as Appendix-I to this petition.

24) It is submitted that the as per the Terms & Conditions of Tariff Regulation 2019 the cut-off date of Barauni Stage-II is 30.11.2024. Certain balance works under original scope of work for the instant station i.e. Ganga make -up water, Wagon tippler etc. are envisaged to get spilled over beyond cut-off date on account of the various unforeseen circumstances beyond the reasonable control of the petitioner and despite regular monitoring & follow-up by the petitioner. It is submitted that the unavoidable and uncontrollable reason like onset of global pandemic COVID-19, land issues etc. has delayed the completion of balance works beyond the reasonable control of the petitioner. It is respectfully submitted that the prime concern of the petitioner was to commence the commercial operation of the units to serve the beneficiaries at the earliest by supplying affordable and reliable power.

25) It is humbly submitted that the Hon'ble Commission has the exclusive Jurisdiction to allow the work after cut-off date since reasons which have caused delay were beyond the

control of the Petitioner. In view of the above, the Hon'ble Commission may be pleased to condone the expected delay in completion of above works and allow the capitalization of the same for the tariff purpose during the tariff period 2024-29 (As per Form-9A), by relaxing the cut-off date beyond 30.11.2024 exercising its powers under Power to Relax under Regulation-102 of Tariff Regulations, 2024. Hon'ble Commission has previously considered such a request and has extended cut-off date for various projects.

26) The Petitioner humbly submits that the pay/wage revision for the employees of the Petitioner will be due wef 01.01.2027. Further, the wage/pay revision of CISF and Kendriya Vidyalaya employees will also be due for revision during the tariff period 2024-29. Regulation-36(1)(8) of CERC (Terms & Conditions of Tariff) Regulations-2024 provides as below:

> *"In the case of a generating company owned by the Central or State Government, the impact on account of implementation of wage or pay revision shall be allowed at the time of truing up of tariff."*

In accordance with the above said regulation, the Petitioner shall approach the Hon'ble Commission for allowing the impact of Pay/wage revision of employees of the Petitioner i.e. NTPC Limited, CISF and Kendriya Vidyalaya (wherever applicable) as additional O&M at the time of truing-up of tariff for the control period 2024-29. Hon'ble Commission may be pleased to grant liberty to consider the impact of wage/pay revision as an additional impact on O&M from the date same is implemented and allow the same as additional O&M over and above the normative O&M.

27) It is submitted the Petitioner has served the copy of the Petition on to the Respondents mentioned herein above and has posted the Petition on the company website i.e. www.ntpc.co.in.

28) In accordance with the 'Conduct of Business Regulations 2023' of the Hon'ble Commission, the Petitioner shall, within 7 days after filing the tariff petition, publish a notice about such filing in at least two daily leading digital newspapers one in English language and another in any of the Indian languages, having wide circulation in each of the States and Union Territories where the beneficiaries are situated, as per Form 14

appended to these regulations. Subsequently, the Petitioner shall submit the proof of publications as soft copies of the publications under an affidavit through the e-filing portal of the Hon'ble Commission within one week from the date of publication. Further, the Petitioner shall also submit the detail of expenses incurred for publication of the notice alongwith the prayer for recovery of Publication Expenses as per Regulation-94 of CERC Tariff Regulations 2024.

29) It is submitted that the Petitioner has already paid the requisite filing fee vide UTR No. 37c568eba62158b7b321 on 24.04.2024 for the year 2024-25 and the details of the same have been duly furnished to the Hon'ble Commission For the subsequent years, it shall be paid as per the provisions of the CERC (Payment of Fees) Regulations, 2012 as amended. Further Regulation 94 (1) of Tariff Regulations 2024 provides that the application fee and publication expenses may be allowed to be recovered directly from the beneficiaries at the discretion of the Hon'ble Commission. Accordingly, it is prayed that Hon'ble Commission may be pleased to allow recovery of filing fee and publication fee directly from the beneficiaries.

30) It is submitted that the petitioner is filing this tariff petition subject to the outcome of its various appeals/ petitions pending before different courts. Besides, the petitions filed by NTPC for determination of capital base as on 31.3.2024 through true-up exercise are pending before the Hon'ble Commission and would take some time. The Petitioner, therefore, reserves its right to amend the tariff petition as per the outcome in such appeals/ petitions, if required.

Prayers

In the light of the above submissions, the Petitioner, therefore, prays that the Hon'ble Commission may be pleased to:

i) Approve tariff of Barauni Thermal Power Station Stage-II (2x250 MW) for the tariff period 01.04.2024 to 31.03.2029.

ii) Allow the recovery of filing fees as & when paid to the Hon'ble Commission and publication expenses from the beneficiaries.

iii) Allow the work beyond cut-off date for the instant station under Regulation-102 of CERC Tariff Regulations 2024 i.e. Power to relax.

iv) Consider Station Heat Rate based on design heat Rate with applicable operating margin.

v) Allow reimbursement of Ash Transportation Charges directly from the beneficiaries on monthly basis, subject to true up.

vi) Grant liberty to approach the Hon'ble Commission to allow for the recovery of pay/wage revision due in 2024-29 period as additional O&M over and above the normative O&M.

vii) Pass any other order as it may deem fit in the circumstances mentioned above.

Petitioner

Noida

BEFORE THE CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

PETITION NO.....

IN THE MATTER OF : Petition Under Section 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-III of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 and Chapter-3, Regulation-9 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for approval of tariff of **Barauni Thermal Power Station Stage-II (2x250 MW) for the period from 01.04.2024 to 31.03.2029**.

Petitioner: : NTPC Ltd.
NTPC Bhawan
Core-7, Scope Complex
7, Institutional Area, Lodhi Road
New Delhi-110 003

Respondents: North Bihar Power Distribution Company Ltd. (NBPDCL) & Others

AFFIDAVIT

I, Prashant Chaturvedi, S/o Dr. S.C Chaturvedi, aged about 48 years, resident of 103, Bhabha Tower, Griha Pravesh, Sector-77, Noida- 201301, do hereby solemnly affirm and state as follows:

1. That the deponent is the Additional General Manager (Commercial) of the Petitioner NTPC Ltd. and is well conversant with the facts and the circumstances of the case and therefore competent to swear this affidavit.

2. That the accompanying Petition under Section 62 and 79 (1) (a) of the Electricity Act, 2003, has been filed by my authorized representative under my instruction and the contents of the same are true and correct to the best of my knowledge and belief.

3. That the contents of Para No....1..... to...30... as mentioned in the Petition are true and correct based on the my personal knowledge, belief and records maintained in the office.

प्रशान्त चतुर्वेदी/PRASHANT CHATURVEDI
अपर महाप्रबन्धक (वाणिज्यिक)
Addl. General Manager (Commercial)
लिमिटेड/NTPC LIMITED

4. That the annexures annexed to the Petition are correct and true copies of the respective originals.

5. That the Deponent has not filed any other Petition or Appeal before any other forum or court of law with respect to the subject matter of the dispute.

(Deponent)

प्रशान्त चतुर्वेदी/PRASHANT CHATURVEDI
अपर महाप्रबन्धक (वाणिज्यिक)
Addl. General Manager (Commercial)
एन टी पी सी लिमिटेड/NTPC LIMITED

Verification:

Verified at Noida on this 29 day of November 2024, that the contents of my above noted affidavit are true and correct to my knowledge and no part of it is false and nothing material has been concealed therefrom.

(Deponent)

प्रशान्त चतुर्वेदी/PRASHANT CHATURVEDI
Addl. General Manager (Commercial)
एन टी पी सी लिमिटेड/NTPC LIMITED

NOTARY
YOGENDRA SINGH
AREA NOIDA
G.B. NAGAR
REGN. NO. 58T...
GOVT. OF INDIA

ATTESTED
YOGENDRA SINGH
NOTARY NOIDA
G B NAGAR (U.P.) INDIA

29 NOV 2024

TARIFF FILING FORMS (THERMAL)

FOR DETERMINATION OF TARIFF

FOR

Barauni (2x250 MW)

(From 01.04.2024 to 31.03.2029)

PART-I

APPENDIX-I

Checklist of Main Tariff Forms and other information for tariff filing for Thermal Stations

Form No.	Title of Tariff Filing Forms (Thermal)	Tick
FORM- 1	Summary of Tariff	✓
FORM -1 (I)	Statement showing claimed capital cost	✓
FORM -1 (II)	Statement showing Return on Equity	✓
FORM-2	Plant Characteristics	✓
FORM-3	Normative parameters considered for tariff computations	✓
FORM-3A**	Statement showing O&M Expenses	✓
FORM-3B**	Statement of Special Allowance	**NA**
FORM- 4	Details of Foreign loans	**NA**
FORM- 4A	Details of Foreign Equity	**NA**
FORM-5	Abstract of Admitted Capital Cost for the existing Projects	**NA**
FORM-5A**	Abstract of Claimed Capital Cost for the existing Projects	**NA**
FORM- 6	Financial Package upto COD	**NA**
FORM- 7	Details of Project Specific Loans	**NA**
FORM- 8	Details of Allocation of corporate loans to various projects	✓
FORM-9A**	Summary of Statement of Additional Capitalisation claimed during the period	✓
FORM-9 ##	Statement of Additional Capitalisation after COD	✓
FORM- 10	Financing of Additional Capitalisation	✓
FORM- 11	Calculation of Depreciation on original project cost	✓
FORM- 12	Statement of Depreciation	✓
FORM- 13	Calculation of Weighted Average Rate of Interest on Actual Loans	✓
FORM- 14	Draw Down Schedule for Calculation of IDC & Financing Charges	**NA**
FORM- 15	Details of Fuel for Computation of Energy Charges	✓
FORM- 15A	Details of Seconday Fuel for Computation of Energy Charges	✓
FORM- 15B	Computation of Energy Charges	✓
FORM- 16	Details of Limestone for Computation of Energy Charge Rate	**NA**
FORM-17	Details of Capital Spares	***
FORM- 18	Non-Tariff Income	***
FORM-19	Details of Water Charges	***
FORM-20	Details of Statutory Charges	***

Provided yearwise for the period 2024-29
**** Additional Forms** **PART-I**
***** Shall be provided at the time of true up**

List of Supporting Forms / documents for tariff filing for Thermal Stations

Form No.	Title of Tariff Filing Forms (Thermal)	Tick
FORM-A	Abstract of Capital Cost Estimates	**NA**
FORM-B	Break-up of Capital Cost for Coal/Lignite based projects	**NA**
FORM-C	Break-up of Capital Cost for Gas/Liquid fuel based Projects	**NA**
FORM-D	Break-up of Construction/Supply/Service packages	**NA**
FORM-E	Details of variables , parameters , optional package etc. for New Project	**NA**
FORM-F	Details of cost over run	**NA**
FORM-G	Details of time over run	**NA**
FORM –H	Statement of Additional Capitalisation during end of the useful life	**NA**
FORM –I	Details of Assets De-capitalised during the period	***
FORM –J	Reconciliation of Capitalisation claimed vis-à-vis books of accounts	***
FORM –K	Statement showing details of items/assets/works claimed under Exclusions	***
FORM-L	Statement of Capital cost	**NA**
FORM-M	Statement of Capital Woks in Progress	**NA**
FORM-N	Calculation of Interest on Normative Loan	**NA**
FORM-O	Calculation of Interest on Working Capital	**NA**
FORM-P	Incidental Expenditure up to SCOD and up to Actual COD	**NA**
FORM-Q	Expenditure under different packages up to SCOD and up to Actual COD	**NA**
FORM-R	Actual cash expenditure	**NA**
FORM-S	Statement of Liability flow	**NA**
FORM-T	Summary of issues involved in the petition	**NA**

***** Shall be provided at the time of true up**

PART-I
FORM- 1

Summary of Tariff

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Barauni (2x250 MW)**
Place (Region/District/State):	**Eastern Region /Bihar**

Amount in Rs. Lakhs

S. No.	Particulars	Unit	Existing 2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7	8	9
1.1	Depreciation	Rs Lakh	14,887.57	15,935.87	16,907.27	17,450.61	17,629.78	17,629.78
1.2	Interest on Loan	Rs Lakh	13,155.73	13,106.80	12,818.28	11,994.74	10,747.58	9,290.40
1.3	Return on Equity	Rs Lakh	16,638.59	17,791.00	18,842.04	19,396.58	19,571.70	19,571.70
1.4	Interest on Working Capital	Rs Lakh	4,767.34	4,873.32	4,966.00	5,040.78	5,099.15	5,159.75
1.5	O&M Expenses	Rs Lakh	22,109.54	24584.81	25946.41	27385.89	28911.53	30520.95
1.6	Special Allowance (If applicable)	Rs Lakh						
1.7	Compensation Allowance (If applicable – relevant for column 4 only)	Rs. Lakh						
	Total	Rs Lakh	**71558.76**	**76291.81**	**79479.99**	**81268.60**	**81959.74**	**82172.57**
2.1	Landed Fuel Cost (coal/gas/RLNG/ liquid)	Rs/Ton		3,607.47				
	(%) of Fuel Quantity	(%)						
2.2	Landed Fuel Cost (coal from Integrated mine) as per FSA, if any, approved by beneficiaries or as per allocation of coal quantity	Rs/Ton						
	(%) of Fuel Quantity	(%)						
2.3	Landed Fuel Cost Imported Coal		NA					
	(%) of Fuel Quantity							
2.4	Landed Fuel Cost (coal/gas /RLNG/liquid) other than FSA	Rs/Ton	NA					
	(%) of Fuel Quantity	(%)						
2.5	Landed Fuel Cost Imported Coal other than FSA.		NA					
	(%) of Fuel Quantity							
3	Secondary Fuel							
	Secondary fuel oil cost	Rs/Unit	0.042	0.042	0.042	0.042	0.042	0.000
	Energy Charge Rate ex-bus (Paise/kWh)	Rs/Unit	2.808	2.808	2.808	2.808	2.808	0.000

(Petitioner)

PART-I
FORM- 1(I)

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Barauni (2x250 MW)**

Amount in Rs. Lakhs

Statement showing claimed capital cost – (A+B)

S. No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7
1	Opening Capital Cost	3,03,826.15	3,27,897.14	3,42,333.86	3,49,436.22	3,49,436.22
2	Add: Addition during the year/period	24,070.99	14,436.72	7,102.36	-	-
3	Less: De-capitalisation during the year/period	-	-	-	-	-
4	Less: Reversal during the year / period	-	-	-	-	-
5	Add: Discharges during the year/ period	-	-	-	-	-
6	Closing Capital Cost	3,27,897.14	3,42,333.86	3,49,436.22	3,49,436.22	3,49,436.22
7	**Average Capital Cost**	**3,15,861.64**	**3,35,115.50**	**3,45,885.04**	**3,49,436.22**	**3,49,436.22**

Statement showing claimed capital cost eligible for RoE at normal rate (A)

S. No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7
1	Opening Capital Cost	303826.15	326823.34	336775.86	339775.86	339775.86
2	Add: Addition during the year / period	22997.19	9952.52	3000.00	0.00	0.00
3	Less: De-capitalisation during the year / period	0.00	0.00	0.00	0.00	0.00
4	Less: Reversal during the year / period	0.00	0.00	0.00	0.00	0.00
5	Add: Discharges during the year / period	0.00	0.00	0.00	0.00	0.00
6	Closing Capital Cost	326823.34	336775.86	339775.86	339775.86	339775.86
7	**Average Capital Cost**	**315324.74**	**331799.60**	**338275.86**	**339775.86**	**339775.86**

Statement showing claimed capital cost eligible for RoE linked to SBI MCLR (B)

S. No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7
1	Opening Capital Cost	0.00	1073.80	5558.00	9660.36	9660.36
2	Add: Addition during the year / period	1073.80	4484.20	4102.36	0.00	0.00
3	Less: De-capitalisation during the year / period	0.00	0.00	0.00	0.00	0.00
4	Less: Reversal during the year / period	0.00	0.00	0.00	0.00	0.00
5	Add: Discharges during the year / period	0.00	0.00	0.00	0.00	0.00
6	Closing Capital Cost	1073.80	5558.00	9660.36	9660.36	9660.36
7	**Average Capital Cost**	**536.90**	**3315.90**	**7609.18**	**9660.36**	**9660.36**

(Petitioner)

PART-I
FORM- 1(IIA)

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Barauni (2x250 MW)**

Statement showing Return on Equity at Normal Rate

Amount in Rs. Lakhs

S. No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7
	Return on Equity					
1	Gross Opening Equity (Normal)	91,147.84	98,047.00	1,01,032.76	1,01,932.76	1,01,932.76
2	Less: Adjustment in Opening Equity	-	-	-	-	-
3	Adjustment during the year	-	-	-	-	-
4	Net Opening Equity (Normal)	91,147.84	98,047.00	1,01,032.76	1,01,932.76	1,01,932.76
5	Add: Increase in equity due to addition during the year / period	6899.16	2985.76	900.00	0.00	0.00
7	Less: Decrease due to De-capitalisation during the year / period	0.00	0.00	0.00	0.00	0.00
8	Less: Decrease due to reversal during the year / period	0.00	0.00	0.00	0.00	0.00
9	Add: Increase due to discharges during the year / period	0.00	0.00	0.00	0.00	0.00
10	Net closing Equity (Normal)	98,047.00	1,01,032.76	1,01,932.76	1,01,932.76	1,01,932.76
11	Average Equity (Normal)	94,597.42	99,539.88	1,01,482.76	1,01,932.76	1,01,932.76
12	Rate of ROE (%)	18.782	18.782	18.782	18.782	18.782
13	Total ROE	**17,767.29**	**18,695.58**	**19,060.49**	**19,145.01**	**19,145.01**

(Petitioner)

PART-I

FORM- 1(IIB)

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Barauni (2x250 MW)**

Statement showing Return on Equity linked to SBI MCLR

Amount in Rs. Lakhs

S. No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7
	Return on Equity @ Rate Linked to SBI MCLR+350 basis points					
1	Gross Opening Equity (Normal)	0.00	322.14	1667.40	2898.11	2898.11
2	Less: Adjustment in Opening Equity	0.00	0.00	0.00	0.00	0.00
3	Adjustment during the year	0.00	0.00	0.00	0.00	0.00
4	Net Opening Equity (Normal)	-	322.14	1,667.40	2,898.11	2,898.11
5	Add: Increase in equity due to addition during the year / period	322.14	1345.26	1230.71	0.00	0.00
7	Less: Decrease due to De-capitalisation during the year / period	0.00	0.00	0.00	0.00	0.00
8	Less: Decrease due to reversal during the year / period	0.00	0.00	0.00	0.00	0.00
9	Add: Increase due to discharges during the year / period	0.00	0.00	0.00	0.00	0.00
10	Net closing Equity (Normal)	322.14	1667.40	2898.11	2898.11	2898.11
11	Average Equity (Normal)	161.07	994.77	2282.75	2898.11	2898.11
12	Rate of ROE (Pre-Tax) (%)	12.15	12.15	12.15	12.15	12.15
13	Rate of ROE (Post-Tax) (%)	14.72	14.72	14.72	14.72	14.72
14	Total ROE	**23.71**	**146.46**	**336.09**	**426.69**	**426.69**

(Petitioner)

PART-I
FORM-2

Name of the Petitioner	**NTPC Ltd.**	
Name of the Generating Station	**Barauni-II TPS (2 x 250 MW)**	
Plant Characteristics		
Unit(s)/Block(s)/Parameters	**Unit-8**	**Unit-9**
Installed Capacity (MW)	250	250
Schedule COD as per Investment Approval (as per Transfer Scheme)	15.12.2020	15.12.2020
Actual COD /Date of Taken Over (as applicable)	01.03.2020 (Actual)	01.11.2021 (Actual)
Pit Head or Non Pit Head or Integrated Mine	Non Pit Head	
Name of the Boiler Manufacture	BHEL	BHEL
Name of Turbine Generator Manufacture	BHEL	BHEL
Main Steams Pressure at Turbine inlet (kg/Cm^2) abs[1].	150	150
Main Steam Temperature at Turbine inlet (^{o}C) [1]	537	537
Reheat Steam Pressure at Turbine inlet (kg/Cm$^{2)\ 1}$	35.77	35.77
Reheat Steam Temperature at Turbine inlet (^{o}C) [1]	537	537
Main Steam flow at Turbine inlet under MCR condition (tons /hr)[2]	739.661	739.661
Main Steam flow at Turbine inlet under VWO condition (tons /hr)[2]	783.151	783.151
Unit Gross electrical output under MCR /Rated condition (MW)[2]	250	250
Unit Gross electrical output under VWO condition (MW)[2]	264.912	264.912
Guaranteed Design Gross Turbine Cycle Heat Rate (kCal/kWh)3	1947.1	1947.1
Conditions on which design turbine cycle heat rate guaranteed		
% MCR	100	100
% Makeup Water Consumption	0	0
Design Capacity of Make up Water System	3% of MCR	3% of MCR
Design Capacity of Inlet Cooling System	37600	37600
Design Cooling Water Temperature (^{0}C)	33	33
Back Pressure	0.1033	0.1033
Steam flow at super heater outlet under BMCR condition (tons/hr)	810	810
Steam Pressure at super heater outlet under BMCR condition) (**kg/Cm^2**)	155	155
Steam Temperature at super heater outlet under BMCR condition (**^{0}C**)	540	540
Steam Temperature at Reheater outlet at BMCR condition (^{0}C)	540	540
Design / Guaranteed Boiler Efficiency (%)[4]	85.6	85.6
Design Fuel with and without Blending of domestic/imported coal	domestic coal	
(GCV) Domestic Design coal	3300	3300
Blended Coal (Domestic Design 70%+ Imported 30%)		
Type of Cooling Tower	IDCT	IDCT
Type of cooling system	Closed Circuit Cooling	
Type of Boiler Feed Pump	2 Nos. Of MDBFP	2 Nos. Of MDBFP
Type of Coal Mill	Ball & Tube type Coal Mill	Ball & Tube type Coal Mill
Type of Boiler	Tangential fired boiler	
Fuel Details[7]		
-Primary Fuel	COAL	
-Secondary Fuel	LDO	
-Alternate Fuels		
Types of SOX control system		
Types of NOX control system	Seperated Over Fire Air dampers (SOFA)	
Details of SPM control system	ESP	
Special Features/Site Specific Features[8]		
Special Technological Features[9]		
Environmental Regulation related features[10]	ESP, Combustion Modification, Provision for FGD	
Any other special features		

Heat Balance Diagram attached as Annexure-D

1: At Turbine MCR condition.
2: with 0% (Nil) make up and design Cooling water temperature
3: at TMCR output based on gross generation, 0% (Nil) makeup and design Cooling water temperature.
4: With Performance coal based on Higher Heating Value (HHV) of fuel and at BMCR) out put
5: Closed circuit cooling, once through cooling, sea cooling, natural draft cooling, induced draft cooling etc.
6: Motor driven, Steam turbine driven etc.
7: Coal or natural gas or Naptha or lignite etc.
8: Any site specific feature such as Merry-Go-Round, Vicinity to sea, Intake /makeup water systems etc. scrubbers etc.
9: Any Special Technological feature like Advanced class FA technology in Gas Turbines, etc.
10: Environmental Regulation related features like FGD, ESP etc.,

Note 1: In case of deviation from specified conditions in Regulation, correction curve of manufacturer may also be submitted.
Note 2: Heat Balance Diagram has to be submitted along with above information in case of new stations.
Note 3: The Terms – MCR, BMCR, HHV, Performance coal, are as defined in CEA Technical Standards for Construction

Petitioner

						PART-I
						FORM- 3

Normative parameters considered for tariff computations

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Barauni (2x250 MW)**

(Year Ending March)

Particulars	Unit	*Existing 2023-24*	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	*3*	4	5	6	7	8
Base Rate of Return on Equity $$	%	*15.50*	15.50	15.50	15.50	15.50	15.50
Base Rate of Return on Equity on Add. Capitalization	%	-	12.15	12.15	12.15	12.15	12.15
Effective Tax Rate	%	*17.4720*	17.4720	17.4720	17.4720	17.4720	17.4720
Target Availability	%	*85.00*	85.00	85.00	85.00	85.00	85.00
Peak Hours	%	*85.00*	85.00	85.00	85.00	85.00	85.00
Off Peak Hours	%	*85.00*	85.00	85.00	85.00	85.00	85.00
ß- Average Monthly Frequency Response Performance ##	0-1		To be provided at time of Truing up				
Auxiliary Energy Consumption	%	*9.80*	9.80	9.80	9.80	9.80	9.80
Gross Station Heat Rate	kCal/kWh	*2388.38*	2388.38	2388.38	2388.38	2388.38	2388.38
Specific Fuel Oil Consumption	ml/kWh	*0.50*	0.50	0.50	0.50	0.50	0.50
Cost of Coal/Lignite for WC1	in Days	*50*	50	50	50	50	50
Cost of Main Secondary Fuel Oil for WC1	in Months	*2*	2	2	2	2	2
Fuel Cost for WC2	in Months						
Liquid Fuel Stock for WC2	in Months						
O&M Expenses	Rs lakh/MW	*37.84*	40.92	43.07	45.33	47.71	50.21

Particulars	Unit	*Existing 2023-24*	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	*3*	4	5	6	7	8
Maintenance Spares for WC	% of O&M	*20.00*	20.00	20.00	20.00	20.00	20.00
Receivables for WC	in Days	*45*	45	45	45	45	45
Storage capacity of Primary fuel	MT		177600				
SBI 1 Year MCLR plus 325 basis point	%	*12.00*	11.90	11.90	11.90	11.90	11.90
SBI 1 Year MCLR plus 350 basis point	%		12.15	12.15	12.15	12.15	12.15
Blending ratio of domestic coal/imported coal							
Norms for consumption of reagent							
Specific Limestone consumption for Wet Limestone FGD							
Specific Limestone consumption for Lime Spray Dryer or Semi-dry FGD							
Specific consumption of sodium bicarbonate							
Specific Limestone consumption for CFBC based generating station							
specific urea consumption of the SNCR							
Specific ammonia consumption of the SCR							
Transit and Handling Losses of coal or lignite, as applicable							
$$ Additional RoE due to better ramp rate would be claimed at the time of true-up or as per guidelines to be issued							

Petitioner

Part-I
FORM-3A
ADDITIONAL FORM

Calculation of O&M Expenses

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Barauni (2x250 MW)**

Amount in Rs. Lakhs

S.No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	**2**	**3**	**4**	**5**	**6**	**7**
1	**O&M expenses under Reg.36(1)**					
1a	Normative	20460.00	21535.00	22665.00	23855.00	25105.00
1b	O&M Expenses - ECS (CM)	32.51	34.22	36.01	37.90	39.89
2	**O&M expenses under Reg.36(1)(6)**					
2a	Water Charges ##	531.15	531.15	531.15	532.61	531.15
2b	Security expenses	3561.15	3846.04	4153.72	4486.02	4844.90
2c	Capital Spares**	SHALL BE PROVIDED AT THE TIME OF TRUE-UP				
3	O&M expenses-Ash Transportation**	SHALL BE PROVIDED LATER/ AT THE TIME OF TRUE-UP				
	Total O&M Expenses	**24584.81**	**25946.41**	**27385.89**	**28911.53**	**30520.95**

Petitioner

PART 1
FORM- 5A

Abstract of Claimed Capital Cost for the existing Projects

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Barauni (2x250 MW)**

Reference of Final True-up Tariff Petition	**Affidavit dated**	
Capital Cost allowed in the Main 2019-24 Tariff Petition no.120/GT/2023	**Rs. Lakhs**	Order awaited
Following details as considered by the Petitioner as on the last date of the period for which final true-up tariff is claimed:		
Capital cost as on 01.04.2024 (cash basis)	**(Rs. in lakh)**	303826.15
Amount of un-discharged liabilities included in above (& forming part of admitted capital cost) as on 31.03.2024		
Amount of un-discharged liabilities corresponding to above admitted capital cost (but not forming part of admitted capital cost being allowed on cash basis)		
Gross Normative Debt		212678.30
Cumulative Repayment		48,497.55
Net Normative Debt		164180.75
Normative Equity		91147.84
Cumulative Depreciation		48,497.55
Freehold land		0

(Petitioner)

PART-I
FORM- 9A
ADDITIONAL FORM

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Ltd.**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2024-29 (Summary)**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed							Justification	Admitted Cost by the Commission, if any
		2024-25	2025-26	2026-27	2027-28	2028-29	Total			
1	2	3	4	5	6	7			8	9
A.	**Works eligble for RoE at Normal Rate**									
1	Ganga Make up water	13,467	1,533				**15,000**	24 (1) (b) & 25(1) with Reg 102	**Pl. refer Form-9 of respective FYs.**	
2	Rail infrastrure works (Includes Simariya Railway siding works, RITES works etc.)	2,261					**2,261**	24 (1) (b		
3	BHEL EPC works- Wagon tippler	4,000	5,000	3,000.00			**12,000**	24 (1) (b) & 25(1) with Reg 102		
4	Township C & D type quarters	3,269	3,419				**6,688**	25(2) (a)		
	Total additional capitalization claimed with RoE at Normal Rate (A)	**22,997**	**9,953**	**3,000**	**-**	**-**	**35,950**			
B.	**Works eligble for Return on Equity linked to SBI MCLR:**									
1	Infrastruture works/facilities for Ash utilization	1,074	1,074	920.40			**3,068**	19(3)(d) & 26(1)(b)	**Pl. refer Form-9 of respective FYs.**	
2	Railway Loading facility at Ash Silo for Ash utilization		2,650	2,650.00			**5,300**	19(3)(d) & 26(1)(b)		
3	Maintenance/ Inspection Pit for Locomotives		271				**271**	26(1) (h)		
4	Construction of Maintenance shed at CHP		59				**59**	26(1) (i)		
5	Augmentation of Power supply for unintruptted opertaion of the plant.		194	273			**467**	26(1)(i)		
6	Construction of chemical laboratory and Chemical storage shed		59	59.00			**118**	26(1) (b), (d) & (i)		
7	Automatic generation control (AGC)		177				**177**	26(1) (b)		
8	Construction of Electrical laboratory building			200.00			**200**	26(1)(i)		
	Total additional capitalization claimed with RoE at SBI MCLR (B)	**1,074**	**4,484**	**4,102**	**-**	**-**	**9,660**			
	Total Add. Cap. Claimed (A+B)	**24,071**	**14,437**	**7,102**	**-**	**-**	**45,610**			

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2024-25**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	2	3	4	5= (3-4)	6	7	8	9
A.	**Works eligble for RoE at Normal Rate**							
1	Ganga Make up water	13467		**13467**		24 (1) (b) & 25(1) with Reg 102	It is submitted that the Ganga Makeup water scheme is under original scope of works with the objective to facilitate the supply of Raw water required for plant operation. Barauni-II was taken over by NTPC from erstwhile owner BSPGCL on 15.12.2018 vide Bihar Govt.notification and the said works were not completed by BSPGCL. The work was delayed due to Out break of Covid-19 pandemic , land issues etc which had a casading affect in related activites. Further,to make the scheme operational and draw regular supply of raw water, the system is required to be fed through uninteruptted power supply. The issue of power supply due to land issue has been taken up with State and DISCOMs Authorities by the petitioner. Hon'ble Commission may be pleased to allow the same.	
2	Rail infrastrure works (Includes Simariya Railway siding works, RITES works etc.)	2261		**2261**		24 (1) (b)	These are Original scope of works related to railway siding works within Cutoff date. Due to out break of Covid-19 Pandamic the work related activties were affected. Hon'ble Commission may be pleased to allow the same.	
3	BHEL EPC works- Wagon tippler	4000		**4000**		24 (1) (b) & 25(1) with Reg 102	These are Original scope of works. Prior to take over of Barauni Station on 15.12.2018 by NTPC, BSPGCL has awarded EPC contract for BSTPS Stage-II 2x250 MW project to BHEL. BHEL has awarded the civil works post take over to M/s A K Singhania and included construction of new Wagon Tippler as the earlier one was settled during construction phase in pre-take over period. However, due to out break of Covid-19 Pandemic the work was severally affected and delayed. Due to non-availability of WTs in Stage-II prior to takeover, Stage-II coal feeding was done by road transport from Stage-I and through manual unloading in Stage-II thereby affecting reliability**.** The wagon tipplers for stage-I were being used for transportation of the fuel upto the station with necessary arranagements. As, Stage-I is now planned to be dismantled with approval of NTPC board of directors, wagon tipplers alongwith associated facilities being developed for smooth fuel supply for plant operation are required. Hon'ble Commission may be pleased to allow the same.	

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
4	Township C & D type quarters	3269.19	-	3,269		25(2) (a)	The instant station was handed over to NTPC under a special transfer scheme on 18.12.2018.by Govt. of Bihar. The exisiting quarters in township are approximately 40 years old and prone to the accident, with intermittent renovations done by BSPGCL and further by NTPC under transfer schemes.The most of the exisiting quarters etc. are in dilapidated conditions and have completed their useful life. A study was conducted through CSIR-Central Building Research Institute (CBRI), Roorkee for Heath Assessment & Remedial Measures for various buildings of BTPS, Barauni and after assesstment , CBRI has recommended for demolition of many residential quarters etc.**(report attached at Annexure-1)**. Now, with the station declared commercial and plant being operational, in view of the safety and security of the plant and sustained operations of the units the strength of employees, associates i.e CISF etc. are bound to increase and needs to be provided with safe accomodation, facilities etc. Therefore, having assessed the structural safety of existing quarters etc., in view to ensure round the clock operation of the station and security, C & D type quarters/dwelling units in township at Barauni station for NTPC employees/CISF are required. Hon'ble Commission may be pleased to allow the same.	
	Total (A)	**19728**	**0.00**	**19728**	**-**			
B.	**Works eligble for Return on Equity linked to SBI MCLR:**							
1	Infrastruture works/facilities for Ash utilization	1073.8	-	1,074		19(3)(d) & 26(1)(b)	The Ash dyke is very small and is surrounded by dense popoulation, hence infrastruture/facility for ash uitilization needs to be developed to maximise the dry ash utilisation of the station in view to avoid ash disposal to ponds having limited capacity. Therefore, infrastructure/facilities such as road, boundary wall etc. needs to be developed in and around plant area to improve and facilitate handling and transportation of ash disposal and utilization. Accordingly petitioner humbly prays to allow the aforesaid expenditure on this account. Petitioner further submits that Hon'ble Commission in its order dated 28.10.2022 in petition no. 205/MP/2021 has recognizes notification dated 31.12.2021 as Change in Law and has considered the need to implement measures to improve utilization of fly ash. "52. ..we direct the Petitioner to ensure the strict compliance of the notificationsissued by the statutory authority and implement measures to improve the utilization of fly ash in all its thermal generating stations, thereby reducing the cost of fly ash transportation....." Hon'ble Commission may be pleased to allow the same under Regulation 19(3)(d) & 26(1) (b).	
	Total (B)	**1,073.80**	**-**	**1,073.80**	**-**			
	Total Add. Cap. Claimed (A+B)	**20,802**	**-**	**20,802**	**-**			

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2025-26**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	2	3	4	5= (3-4)	6	7	8	9
A.	**Works eligble for RoE at Normal Rate**							
1	Ganga Make up water	1533		1533		25(1) with Reg 102	It is submitted that the Ganga Makeup water scheme is under original scope of works with the objective to facilitate the supply of Raw water required for plant operation. Barauni-II was taken over by NTPC from erstwhile owner BSPGCL on 15.12.2018 vide Bihar Govt.notification and the said works were not completed by BSPGCL. The work was delayed due to Out break of Covid-19 pandemic , land issues etc which had a casading affect in related activites. Further,to make the scheme operational and draw regular supply of raw water, the system is required to be fed through uninteruptted power supply. The issue of power supply due to land issue has been taken up with State and DISCOMs Authorities by the petitioner. Hon'ble Commission may be pleased to allow the same.	
2	BHEL EPC works- Wagon tippler	5000		5000		25(1) with Reg 102	These are Original scope of works. Prior to take over of Barauni Station on 15.12.2018 by NTPC, BSPGCL has awarded EPC contract for BSTPS Stage-II 2x250 MW project to BHEL. BHEL has awarded the civil works post take over to M/s A K Singhania and included construction of new Wagon Tippler as the earlier one was settled during construction phase in pre-take over period. However, due to out break of Covid-19 Pandemic the work was severally affected and delayed. Due to non-availability of WTs in Stage-II prior to takeover, Stage-II coal feeding was done by road transport from Stage-I and through manual unloading in Stage-II thereby affecting reliability**.** The wagon tipplers for stage-I were being used for transportation of the fuel upto the station with necessary arranagements. As, Stage-I is now planned to be dismantled with approval of NTPC board of directors, wagon tipplers alongwith associated facilities being developed for smooth fuel supply for plant operation are required. Hon'ble Commission may be pleased to allow the same.	

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
3	Township C & D type quarters	3419.19	-	3419		25(2) (a)	The instant station was handed over to NTPC under a special transfer scheme on 18.12.2018.by Govt. of Bihar. The exisiting quarters in township are approximately 40 years old and prone to the accident, with intermittent renovations done by BSPGCL and further by NTPC under transfer schemes.The most of the exisiting quarters etc. are in dilapidated conditions and have completed their useful life. A study was conducted through CSIR-Central Building Research Institute (CBRI), Roorkee for Heath Assessment & Remedial Measures for various buildings of BTPS, Barauni and after assesstment , CBRI has recommended for demolition of many residential quarters etc.**(report attached at Annexure-1)**. Now, with the station declared commercial and plant being operational, in view of the safety and security of the plant and sustained operations of the units the strength of employees, associates i.e CISF etc. are bound to increase and needs to be provided with safe accomodation, facilities etc. Therefore, having assessed the structural safety of existing quarters etc., in view to ensure round the clock operation of the station and security, C & D type quarters/dwelling units in township at Barauni station for NTPC employees/CISF are required. Hon'ble Commission may be pleased to allow the same.	
	Total (A)	**6533**	**0**	**6533**	**-**			
B.	**Works eligble for Return on Equity linked to SBI MCLR:**							
1	Infrastruture works/facilities for Ash utilization	1073.8	-	1,074		19(3)(d) & 26(1)(b)	The Ash dyke is very small and is surrounded by dense popoulation, hence infrastruture/facility for ash uitilization needs to be developed to maximise the dry ash utilisation of the station in view to avoid ash disposal to ponds having limited capacity. Therefore, infrastructure/facilities such as road , boundary wall etc. needs to be developed in and around plant area to improve and facilitate handling and transportation of ash disposal and utilization. Accordingly petitioner humbly prays to allow the aforesaid expenditure on this account. Petitioner further submits that Hon'ble Commission in its order dated 28.10.2022 in petition no. 205/MP/2021 has recognizes notification dated 31.12.2021 as Change in Law and has considered the need to implement measures to improve utilization of fly ash. "52. ..we direct the Petitioner to ensure the strict compliance of the notificationsissued by the statutory authority and implement measures to improve the utilization of fly ash in all its thermal generating stations, thereby reducing the cost of fly ash transportation....." Hon'ble Commission may be pleased to allow the same under Regulation 19(3)(d) & 26(1) (b).	

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
2	Railway Loading facility at Ash Silo for Ash utilization	2650	-	2,650		19(3)(d) & 26(1)(b)	Ash dyke is very small and is surrounded by dense popoulation, hence infrastruture/facility for ash uitilization needs to be developed to maximise the dry ash utilisation of the station in view to avoid ash disposal to ponds having limited capacity. Further, Fly Ash demand is more in the region. Hence, this facility shall improve and facilitate handling and transportation of ash disposal and utilization in ecofriendly manner from Barauni Station. Petitioner further submits that Hon'ble Commission in its order dated 28.10.2022 in petition no. 205/MP/2021 has recognizes notification dated 31.12.2021 as Change in Law and has considered the need to implement measures to improve utilization of fly ash. *"52. ..we direct the Petitioner to ensure the strict compliance of the notificationsissued by the statutory authority and implement measures to improve the utilization of fly ash in all its thermal generating stations, thereby reducing the cost of fly ash transportation....."* Hon'ble Commission may be pleased to allow the same under Regulation 19(3)(d) & 26(1) (b).	
3	Maintenance/ Inspection Pit for Locomotives	271.4	-	271		26(1) (h)	It is submitted that for better maintenance/ Inspection, pit for undercarriage maintenence / inspection of Locomotives has to be incorporated within the existing railway siding track of Barauni Stage-II. The Track under pit and shed are essentially required for the regular inspection & maintenance of the Locomotives under carriage.This system will help to reduce the downtime for maintanenace and inspection of the locomotives thus increasing the safety and efficiency in fuel supply for plant and will also result in reduction of operation cost. In view of the same, Hon'ble Commission may please to allow the work under regulation 26(1)(h)	
4	Construction of Maintenance shed at CHP	59	-	59		26(1) (i)	The construction of maintenance shed at CHP area for the maintenance of heavy earth moving equipments & other CHP equipments is required for sustained operation of the station.This is will help to increase the efficiency in fuel supply of plant which will result in reduction of operation cost. Hon'ble Commission may kindly allow the said work.	
5	Augmentation of Power supply for unintrupted opertaion of the plant.	194	-	194		26(1)(i)	It is submitted that after the proposed decommissioning of Stage-I ,the common facilities for the station are to be operated with a dedicated power supply from Stage-II for the sustained operation of the station. The common facilities facilities like Wagon tippler, crusher house, switchyard etc. located in Stage-I need to be kept operational. Reliable and redundant power supply for the above facilities is very much needed for uninterupted operation of the Stage-II. Hence, the proposed capital expenditure for augmentation of reliable power supply for above facilities is very much required in view of the availabiliy of CHP and to improve the reliablity of AWRS system for the sustained operation of plant. Hon'ble Commission may kindly allow the said work.	

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	2	3	4	5= (3-4)	6	7	8	9
6	Construction of chemical laboratory and Chemical storage shed	59	-	59		26(1) (b), (d) & (i)	For storage and testing of hazardous industrial chemical it is essentially required to have separate storage and testing facilities. Chemicals are stored in designated location to reduces the risk of spills, leaks, and unauthorized access. Handling and storing of hazardous industrial chemicals in an environmentally sound manner is necessary, in view of the safety concerns. Hazardous Chemicals cannot be kept in open condition and requires storage. Further, dedicated testing facilities will enhace the reliability of PT /DM plant and ensure smooth plant operation, hense will reduce the down time. These work includes construction of additional chemical laboratory rooms to set up DGA-Oil lab, environment lab and laboratory store room alongwith bulk chemical storage shed for proper keeing of various bulk chemicals used in Boiler water treatment, pretreatment and CW treatment in plant area. Hon'ble Commission may kindly allow the said work.	
7	Automatic generation control (AGC)	177	-	177		26(1) (b)	Hon'ble Commission vide its order dated 28.08.2019 in petition no.319/RC/2018 directed all ISGS station to implement the AGC as per observation given below: "34. In the interest of reliable and safe grid operation, the Commission directs that all the ISGS stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC be implemented as per the following direction: i. All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. NLDC shall notify the said requirements within one month of this order. ....." Copy of order dated 28.08.2019 is attached as **Annexure-2.** Accordingly, in compliance of direction of Hon'ble Commission, implementation of AGC is to be carried out at the instant station. Further, Hon'ble Commission has allowed additional capital expenditure incurred on implementation of AGC in Petition No-396/GT/2020 vide its order dated 27.09.2022. Therefore, it is humbly requested that Hon'ble Commission may be pleased to allow the same at the instant station.	
	Total (B)	**4484**	**0**	**4484**	**-**			
	Total Add. Cap. Claimed (A+B)	**11018**	**-**	**11,018**	**-**			

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2026-27**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	2	3	4	5= (3-4)	6	7	8	9
A.	**Works eligble for RoE at Normal Rate**							
1	BHEL EPC works- Wagon tippler	3000		**3000**		25(1) with Reg 102	These are Original scope of works. Prior to take over of Barauni Station on 15.12.2018 by NTPC, BSPGCL has awarded EPC contract for BSTPS Stage-II 2x250 MW project to BHEL. BHEL has awarded the civil works post take over to M/s A K Singhania and included construction of new Wagon Tippler as the earlier one was settled during construction phase in pre-take over period. However, due to out break of Covid-19 Pandemic the work was severally affected and delayed. Due to non-availability of WTs in Stage-II prior to takeover, Stage-II coal feeding was done by road transport from Stage-I and through manual unloading in Stage-II thereby affecting reliability**.** The wagon tipplers for stage-I were being used for transportation of the fuel upto the station with necessary arranagements. As, Stage-I is now planned to be dismantled with approval of NTPC board of directors, wagon tipplers alongwith associated facilities being developed for smooth fuel supply for plant operation are required. Hon'ble Commission may be pleased to allow the same.	
	Total Add. Cap. Claimed (A)	**3,000.00**	**-**	**3,000.00**	**-**			
B	**Works eligble for Return on Equity linked to SBI MCLR:**							
1	Infrastruture works/facilities for Ash utilization	920		**920**		19(3)(d) & 26(1)(b)	The Ash dyke is very small and is surrounded by dense popoulation, hence infrastruture/facility for ash uitilization needs to be developed to maximise the dry ash utilisation of the station in view to avoid ash disposal to ponds having limited capacity. Therefore, infrastructure/facilities such as road , boundary wall etc. needs to be developed in and around plant area to improve and facilitate handling and transportation of ash disposal and utilization. Accordingly petitioner humbly prays to allow the aforesaid expenditure on this account. Petitioner further submits that Hon'ble Commission in its order dated 28.10.2022 in petition no. 205/MP/2021 has recognizes notification dated 31.12.2021 as Change in Law and has considered the need to implement measures to improve utilization of fly ash. "52. ..we direct the Petitioner to ensure the strict compliance of the notificationsissued by the statutory authority and implement measures to improve the utilization of fly ash in all its thermal generating stations, thereby reducing the cost of fly ash transportation....." Hon'ble Commission may be pleased to allow the same under Regulation 19(3)(d) & 26(1) (b).	
2	Railway Loading facility at Ash Silo for Ash utilization	2650		**2650**		19(3)(d) & 26(1)(b)	Ash dyke is very small and is surrounded by dense popoulation, hence infrastruture/facility for ash uitilization needs to be developed to maximise the dry ash utilisation of the station in view to avoid ash disposal to ponds having limited capacity. Further, Fly Ash demand is more in the region. Hence, this facility shall improve and facilitate handling and transportation of ash disposal and utilization in ecofriendly manner from Barauni Station. Petitioner further submits that Hon'ble Commission in its order dated 28.10.2022 in petition no. 205/MP/2021 has recognizes notification dated 31.12.2021 as Change in Law and has considered the need to implement measures to improve utilization of fly ash. *"52. ..we direct the Petitioner to ensure the strict compliance of the notificationsissued by the statutory authority and implement measures to improve the utilization of fly ash in all its thermal generating stations, thereby reducing the cost of fly ash transportation....."* Hon'ble Commission may be pleased to allow the same under Regulation 19(3)(d) & 26(1) (b).	

Sl. No.	Head of Work /Equipment		ACE Claimed (Actual / Projected)			Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
3	Augmentation of Power supply for uninterupted operation of the plant.	273		**273**		26(1)(i)	It is submitted that after the proposed decommissioning of Stage-I ,the common facilities for the station are to be operated with a dedicated power supply from Stage-II for the sustained operation of the station. The common facilities facilities like Wagon tippler, crusher house, switchyard etc. located in Stage-I need to be kept operational. Reliable and redundant power supply for the above facilities is very much needed for uninterupted operation of the Stage-II. Hence, the proposed capital expenditure for augmentation of reliable power supply for above facilities is very much required in view of the availabiliy of CHP and to improve the reliablity of AWRS system for the sustained operation of plant. Hon'ble Commission may kindly allow the said work.	
4	Construction of Electrical laboratory building	200		**200**		26(1)(i)	It is submitted that to support the regular maintenance, ensure healthiness etc. of the electrical equipment/systems installed in plant area, testing of these equipments/system are done through various electrical testing equipments/kits. These testing equipments are of critical nature that needs to be kept in controlled enviroment and to be secured to ensure their reliability, functionality and safety. However, due to the limited space constraints etc. in the exisiting buildings, which lacks the necessary controlled environment, safety and security, there is requirement to establish electrical lab that addresses these contraints. In view to above, a dedicated electrical lab building needs to be constructed to ensure proper storage of sensitive and expensive testing equipment/ kits alongwith required setup. This will ensure to reduce downtime of equipment/system, secure expensive equipments and thereby improving plant operation. Hon'ble commission may please to allow the same.	
5	Construction of chemical laboratory and Chemical storage shed	59		**59**		26(1) (b), (d) & (i)	For storage and testing of hazardous industrial chemical it is essentially required to have separate storage and testing facilities. Chemicals are stored in designated location to reduce the risk of spills, leaks, and unauthorized access. Handling and storing of hazardous industrial chemicals in an environmentally sound manner is necessary, in view of the safety concerns. Hazardous Chemicals cannot be kept in open condition and requires storage. Further, dedicated testing facilities will enhace the reliability of PT /DM plant and ensure smooth plant operation, hence will reduce the down time. These work includes construction of additional chemical laboratory rooms to set up DGA-Oil lab, environment lab and laboratory room. Also, bulk chemical storage shed for proper keeing of various bulk chemicals used in Boiler water treatment, pretreatment and CW treatment in plant area are required. Hon'ble Commission may kindly allow the said work.	
Total Add. Cap. Claimed (B)		**4,102.36**	**-**	**4,102.36**	**-**	**-**		
Total Add. Cap. Claimed (A+B)		**7102**	**0**	**7102**				

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2027-28**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
A.	**Works eligble for RoE at Normal Rate**							
	Total Add. Cap. Claimed (A)	**-**	**-**	**-**	**-**			
B	**Works eligble for Return on Equity linked to SBI MCLR:**							
	Total Add. Cap. Claimed (B)	**-**	**-**	**-**	**-**	**-**		

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
COD	**01-11-2021**
For Financial Year	**2028-29**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)				Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		Accrual basis as per IGAAP	Un-discharged Liability included in col. 3	Cash basis	IDC included in col. 3			
1	**2**	**3**	**4**	**5= (3-4)**	**6**	**7**	**8**	**9**
A.	**Works eligble for RoE at Normal Rate**							
1								
	Total (A)	**-**	**-**	**-**	**-**			
B.	**Works eligble for Return on Equity linked to SBI MCLR:**							
1			-	-				
	Total (B)	**0**	**-**	**-**	**-**			
	Total Add. Cap. Claimed (A+B)	**0**	**-**	**-**	**-**			

(Petitioner)

PART-I
FORM- 10

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Barauni (2x250 MW)**
Date of Commercial Operation	**01-11-2021**

Amount in Rs Lakh

Financial Year (Starting from COD)1	Actual					Admitted				
	2024-25	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**
1		3	4	5	6	7	8	9	10	11
Amount capitalised in Work/ Equipment										
Financing Details										
Loan-1										
Loan-2										
Loan-3 and so on										
Total Loan2										
Equity Internal Resources										
Others (Pl. specify)										
Total										

Add cap is proposed to be finance in Debt:Equity ratio of 70:30

(Petitioner)

				PART-I
				FORM- 11
Calculation of Depreciation				
Name of the Petitioner: NTPC Limited				
Name of the Generating Station : Barauni (2x250 MW)				
				(Amount in Rs Lakh)
Sl.No.	Name of the Assets	**Gross Block as on 31.03.2024**	**Depreciation Rates as per CERC's Depreciation Rate Schedule**	**Depreciation Amount on Gross Block as on 31.03.2024**
1	**2**	**3**	**4**	**5=Col.3 X Col.4**
1	Freehold Land		0.00	0
2	Leasehold Land	2244.77	3.34	74.98
3	Roads, bridges, culverts & helipads	1703.37	3.34	56.89
4	Main plant	30799.79	3.34	1028.71
5	Other Buildings	9279.51	3.34	309.94
6	Temporary erection	33.70	100.00	33.7
7	Water supply, drainage & sewerage	1750.40	5.28	92.42
8	Railway siding	5600.34	5.28	295.7
9	Plant and machinery	269694.15	5.28	14239.85
10	Furniture and fixtures	638.40	6.33	40.41
11	Vehicles - Owned	95.63	9.50	9.09
12	Other Office Equipments	389.98	6.33	24.69
13	EDP, WP machines & SATCOM equipment	385.73	15.00	57.86
14	Construction equipment	311.74	5.28	16.46
15	Electrical installations	2102.71	5.28	111.02
16	Communication equipment	81.32	6.33	5.15
17	Hospital equipment	68.59	5.28	3.62
18	Laboratory and workshop equipment	81.95	5.28	4.33
19	Software	53.48	15.00	8.02
	TOTAL	**325315.55**		**16412.84**
	Weighted Average Rate of Depreciation (%)			**5.045%**

PART-I
FORM- 12

Statement of Depreciation

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Barauni (2x250 MW)**

(Amount in Rs Lakh)

S. No.	Particulars	*Existing 2023-24*	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7	8
1	Opening Capital Cost	*286760.17*	3,03,826.15	3,27,897.14	3,42,333.86	3,49,436.22	3,49,436.22
2	Closing Capital Cost	*303826.15*	3,27,897.14	3,42,333.86	3,49,436.22	3,49,436.22	3,49,436.22
3	Average Capital Cost	*295293.16*	3,15,861.64	3,35,115.50	3,45,885.04	3,49,436.22	3,49,436.22
1a	Cost of IT Equipments & Software included in (1) above *	*284.08*	333.97	333.97	333.97	333.97	333.97
2a	Cost of IT Equipments & Software included in (2) above *	*49.89*	333.97	333.97	333.97	333.97	333.97
3a	Average Cost of IT Equipments & Software	*166.98*	333.97	333.97	333.97	333.97	333.97
4	Freehold land	*0.00*	-	-	-	-	-
5	Rate of depreciation	*5.04%*	5.05%	5.05%	5.05%	5.05%	5.05%
6	Depreciable value	*2,65,794.74*	2,84,308.87	3,01,637.34	3,11,329.93	3,14,525.99	3,14,525.99
7.	Balance useful life at the beginning of the period	*22.75*	21.75	20.75	19.75	18.75	17.75
8	Remaining depreciable value	*2,32,089.38*	2,35,811.32	2,37,203.92	2,29,989.24	2,15,734.69	1,98,104.91
9	Depreciation (for the period)	*14,887.57*	15,935.87	16,907.27	17,450.61	17,629.78	17,629.78
10	Depreciation (annualised)	*14,887.57*	**15,935.87**	**16,907.27**	**17,450.61**	**17,629.78**	**17,629.78**
11	Cumulative depreciation at the end of the period	*48592.93*	64,433.42	81,340.69	98,791.30	1,16,421.08	1,34,050.86
12	Less: Cumulative depreciation adjustment on account of un-discharged liabilities deducted as on 01.04.2009	*0.00*	-	-	-	-	-
13	Add: Cumulative depreciation adjustment on account of liability Discharge	*0.00*	-	-	-	-	-
14	Less: Cumulative depreciation adjustment on account of de-capitalisation	*95.38*	-	-	-	-	-
15	Net Cumulative depreciation at the end of the period after adjustments	*48,497.55*	64,433.42	81,340.69	98,791.30	1,16,421.08	1,34,050.86

* *Shall be provided at the time of true up*

(Petitioner)

Calculation of Interest on Actual Loans

Form -13

Name of the Company NTPC LTD.

Name of the Power Station Barauni TPS Stage-II

(Rs Lakhs)

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	2					
1	**State Bank of India-XI - Repayment from 01.10.2022**					
	Gross loan - Opening	1,89,200	1,89,200	1,89,200	1,89,200	1,89,200
	Cumulative repayments of Loans upto previous period	42,044	63,067	84,089	1,05,111	1,26,133
	Net loan - Opening	1,47,156	1,26,133	1,05,111	84,089	63,067
	Increase/ Decrease due to FERV	-	-	-	-	-
	Increase/ Decrease due to ACE/Drawl during the period	-	-	-	-	-
	Total	1,47,156	1,26,133	1,05,111	84,089	63,067
	Repayments of Loans during the period	21,022	21,022	21,022	21,022	21,022
	Net loan - Closing	1,26,133	1,05,111	84,089	63,067	42,044
	Average Net Loan	1,36,644	1,15,622	94,600	73,578	52,556
	Rate of Interest on Loan	8.2000%	8.2000%	8.2000%	8.2000%	8.2000%
	Interest on Loan Annualised	11,205	9,481	7,757	6,033	4,310
2	**PNB-V-D-4- Repayment from 27-03-2024**					
	Gross loan - Opening	4000.00	4000.00	4000.00	4000.00	4000.00
	Cumulative repayments of Loans upto previous period	333.33	666.67	1000.00	1333.33	1666.67
	Net loan - Opening	3666.67	3333.33	3000.00	2666.67	2333.33
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	3666.67	3333.33	3000.00	2666.67	2333.33
	Repayments of Loans during the period	333.33	333.33	333.33	333.33	333.33
	Net loan - Closing	3333.33	3000.00	2666.67	2333.33	2000.00
	Average Net Loan	3500.00	3166.67	2833.33	2500.00	2166.67
	Rate of Interest on Loan	7.9000%	7.9000%	7.9000%	7.9000%	7.9000%
	Interest on Loan Annualised	276.50	250.17	223.83	197.50	171.17
3	**HDFC IV - Repayment wef 17.4.2021 - Nine instalments**					
	Gross loan - Opening	500.00	500.00	500.00	500.00	500.00
	Cumulative repayments of Loans upto previous period	71.43	142.86	214.29	285.71	357.14
	Net loan - Opening	428.57	357.14	285.71	214.29	142.86
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	428.57	357.14	285.71	214.29	142.86
	Repayments of Loans during the period	71.43	71.43	71.43	71.43	71.43
	Net loan - Closing	357.14	285.71	214.29	142.86	71.43
	Average Net Loan	392.86	321.43	250.00	178.57	107.14
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on Loan Annualised	31.23	25.55	19.88	14.20	8.52
4	**HDFC-X-D-02 - Repayment wef 24.11.2025**					
	Gross loan - Opening	2000.00	2000.00	2000.00	2000.00	2000.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	166.67	333.33	500.00
	Net loan - Opening	2000.00	2000.00	1833.33	1666.67	1500.00

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	2000.00	2000.00	1833.33	1666.67	1500.00
	Repayments of Loans during the period	0.00	166.67	166.67	166.67	166.67
	Net loan - Closing	2000.00	1833.33	1666.67	1500.00	1333.33
	Average Net Loan	2000.00	1916.67	1750.00	1583.33	1416.67
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on Loan Annualised	159.00	152.38	139.13	125.88	112.63
5	**HDFC-X-D-03 - Repayment wef 24.11.2025**					
	Gross loan - Opening	1500.00	1500.00	1500.00	1500.00	1500.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	125.00	250.00	375.00
	Net loan - Opening	1500.00	1500.00	1375.00	1250.00	1125.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1500.00	1500.00	1375.00	1250.00	1125.00
	Repayments of Loans during the period	0.00	125.00	125.00	125.00	125.00
	Net loan - Closing	1500.00	1375.00	1250.00	1125.00	1000.00
	Average Net Loan	1500.00	1437.50	1312.50	1187.50	1062.50
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on Loan Annualised	119.25	114.28	104.34	94.41	84.47
6	**IndusInd Bank - Drawl 01 - Repayment wef 15.07.2026**					
	Gross loan - Opening	800.00	800.00	800.00	800.00	800.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	66.67	133.33
	Net loan - Opening	800.00	800.00	800.00	733.33	666.67
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	800.00	800.00	800.00	733.33	666.67
	Repayments of Loans during the period	0.00	0.00	66.67	66.67	66.67
	Net loan - Closing	800.00	800.00	733.33	666.67	600.00
	Average Net Loan	800.00	800.00	766.67	700.00	633.33
	Rate of Interest on Loan	8.0500%	8.0500%	8.0500%	8.0500%	8.0500%
	Interest on Loan Annualised	64.40	64.40	61.72	56.35	50.98
7	**ICICI Bank Ltd-VII - Drawl 04 - Repayment wef 30.12.2024**					
	Gross loan - Opening	1200.00	1200.00	1200.00	1200.00	1200.00
	Cumulative repayments of Loans upto previous period	0.00	100.00	200.00	300.00	400.00
	Net loan - Opening	1200.00	1100.00	1000.00	900.00	800.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1200.00	1100.00	1000.00	900.00	800.00
	Repayments of Loans during the period	100.00	100.00	100.00	100.00	100.00
	Net loan - Closing	1100.00	1000.00	900.00	800.00	700.00
	Average Net Loan	1150.00	1050.00	950.00	850.00	750.00
	Rate of Interest on Loan	8.0000%	8.0000%	8.0000%	8.0000%	8.0000%
	Interest on Loan Annualised	92.00	84.00	76.00	68.00	60.00

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
8	**HDFC XII-Drawl 01 - Repayment wef 13.10.2027**					
	Gross loan - Opening	1000.00	1000.00	1000.00	1000.00	1000.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	83.33
	Net loan - Opening	1000.00	1000.00	1000.00	1000.00	916.67
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1000.00	1000.00	1000.00	1000.00	916.67
	Repayments of Loans during the period	0.00	0.00	0.00	83.33	83.33
	Net loan - Closing	1000.00	1000.00	1000.00	916.67	833.33
	Average Net Loan	1000.00	1000.00	1000.00	958.33	875.00
	Rate of Interest on Loan	7.6000%	7.6000%	7.6000%	7.6000%	7.6000%
	Interest on Loan Annualised	76.00	76.00	76.00	72.83	66.50
9	**HDFC XII-Drawl 03- Repayment wef 13.10.2027**					
	Gross loan - Opening	2000.00	2000.00	2000.00	2000.00	2000.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	166.67
	Net loan - Opening	2000.00	2000.00	2000.00	2000.00	1833.33
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	2000.00	2000.00	2000.00	2000.00	1833.33
	Repayments of Loans during the period	0.00	0.00	0.00	166.67	166.67
	Net loan - Closing	2000.00	2000.00	2000.00	1833.33	1666.67
	Average Net Loan	2000.00	2000.00	2000.00	1916.67	1750.00
	Rate of Interest on Loan	7.6000%	7.6000%	7.6000%	7.6000%	7.6000%
	Interest on Loan Annualised	152.00	152.00	152.00	145.67	133.00
10	**HDFC XII-Drawl 04- Repayment wef 13.10.2027**					
	Gross loan - Opening	900.00	900.00	900.00	900.00	900.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	75.00
	Net loan - Opening	900.00	900.00	900.00	900.00	825.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	900.00	900.00	900.00	900.00	825.00
	Repayments of Loans during the period	0.00	0.00	0.00	75.00	75.00
	Net loan - Closing	900.00	900.00	900.00	825.00	750.00
	Average Net Loan	900.00	900.00	900.00	862.50	787.50
	Rate of Interest on Loan	7.6000%	7.6000%	7.6000%	7.6000%	7.6000%
	Interest on Loan Annualised	68.40	68.40	68.40	65.55	59.85
11	**HDFC XII -Drawl 06 - Repayment wef 13.10.2027**					
	Gross loan - Opening	400.00	400.00	400.00	400.00	400.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	33.33
	Net loan - Opening	400.00	400.00	400.00	400.00	366.67
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	400.00	400.00	400.00	400.00	366.67
	Repayments of Loans during the period	0.00	0.00	0.00	33.33	33.33
	Net loan - Closing	400.00	400.00	400.00	366.67	333.33
	Average Net Loan	400.00	400.00	400.00	383.33	350.00

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Rate of Interest on Loan	7.6000%	7.6000%	7.6000%	7.6000%	7.6000%
	Interest on Loan Annualised	30.40	30.40	30.40	29.13	26.60
12	**Bond Series-74 - Repayment 21.4.2036**					
	Gross loan - Opening	1500.00	1500.00	1500.00	1500.00	1500.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	0.00
	Net loan - Opening	1500.00	1500.00	1500.00	1500.00	1500.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1500.00	1500.00	1500.00	1500.00	1500.00
	Repayments of Loans during the period	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	1500.00	1500.00	1500.00	1500.00	1500.00
	Average Net Loan	1500.00	1500.00	1500.00	1500.00	1500.00
	Rate of Interest on Loan	6.9000%	6.9000%	6.9000%	6.9000%	6.9000%
	Interest on Loan Annualised	103.50	103.50	103.50	103.50	103.50
13	**Bond Series-75 (Repayment Sep-2031)**					
	Gross loan - Opening	8400.00	8400.00	8400.00	8400.00	8400.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	0.00
	Net loan - Opening	8400.00	8400.00	8400.00	8400.00	8400.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	8400.00	8400.00	8400.00	8400.00	8400.00
	Repayments of Loans during the period	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	8400.00	8400.00	8400.00	8400.00	8400.00
	Average Net Loan	8400.00	8400.00	8400.00	8400.00	8400.00
	Rate of Interest on Loan	6.7200%	6.7200%	6.7200%	6.7200%	6.7200%
	Interest on Loan Annualised	564.48	564.48	564.48	564.48	564.48
14	**Bond Series-78 (Repayment Aug-2032)**					
	Gross loan - Opening	500.00	500.00	500.00	500.00	500.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	0.00
	Net loan - Opening	500.00	500.00	500.00	500.00	500.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	500.00	500.00	500.00	500.00	500.00
	Repayments of Loans during the period	0.00	0.00	0.00	0.00	0.00
	Net loan - Closing	500.00	500.00	500.00	500.00	500.00
	Average Net Loan	500.00	500.00	500.00	500.00	500.00
	Rate of Interest on Loan	7.4700%	7.4700%	7.4700%	7.4700%	7.4700%
	Interest on Loan Annualised	37.35	37.35	37.35	37.35	37.35
15	**USD 750 Million I Drawl 1 - Repayment wef October 2026**					
	Gross loan - Opening	1050.00	1050.00	1050.00	1050.00	1050.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	150.00	300.00
	Net loan - Opening	1050.00	1050.00	1050.00	900.00	750.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1050.00	1050.00	1050.00	900.00	750.00
	Repayments of Loans during the period	0.00	0.00	150.00	150.00	150.00

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Net loan - Closing	1050.00	1050.00	900.00	750.00	600.00
	Average Net Loan	1050.00	1050.00	975.00	825.00	675.00
	Rate of Interest on Loan	6.7698%	6.7698%	6.7698%	6.7698%	6.7698%
	Interest on Loan Annualised	71.08	71.08	66.01	55.85	45.70
16	**USD 750 Million I Drawl II - Repayment wef October 2026**					
	Gross loan - Opening	4625.00	4625.00	4625.00	4625.00	4625.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	660.71	1321.43
	Net loan - Opening	4625.00	4625.00	4625.00	3964.29	3303.57
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	4625.00	4625.00	4625.00	3964.29	3303.57
	Repayments of Loans during the period	0.00	0.00	660.71	660.71	660.71
	Net loan - Closing	4625.00	4625.00	3964.29	3303.57	2642.86
	Average Net Loan	4625.00	4625.00	4294.64	3633.93	2973.21
	Rate of Interest on Loan	6.7698%	6.7698%	6.7698%	6.7698%	6.7698%
	Interest on Loan Annualised	313.10	313.10	290.74	246.01	201.28
17	**USD 750 Million I Drawl III - Repayment wef October 2026**					
	Gross loan - Opening	500.00	500.00	500.00	500.00	500.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	71.43	142.86
	Net loan - Opening	500.00	500.00	500.00	428.57	357.14
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	500.00	500.00	500.00	428.57	357.14
	Repayments of Loans during the period	0.00	0.00	71.43	71.43	71.43
	Net loan - Closing	500.00	500.00	428.57	357.14	285.71
	Average Net Loan	500.00	500.00	464.29	392.86	321.43
	Rate of Interest on Loan	6.7698%	6.7698%	6.7698%	6.7698%	6.7698%
	Interest on Loan Annualised	33.85	33.85	31.43	26.60	21.76
18	**USD 750 Million I Drawl IV - Repayment wef October 2026**					
	Gross loan - Opening	1300.00	1300.00	1300.00	1300.00	1300.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	185.71	371.43
	Net loan - Opening	1300.00	1300.00	1300.00	1114.29	928.57
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	1300.00	1300.00	1300.00	1114.29	928.57
	Repayments of Loans during the period	0.00	0.00	185.71	185.71	185.71
	Net loan - Closing	1300.00	1300.00	1114.29	928.57	742.86
	Average Net Loan	1300.00	1300.00	1207.14	1021.43	835.71
	Rate of Interest on Loan	6.7698%	6.7698%	6.7698%	6.7698%	6.7698%
	Interest on Loan Annualised	88.01	88.01	81.72	69.15	56.58
19	**USD 750 Million I Drawl VI - Repayment wef October 2026**					

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Gross loan - Opening	2000.00	2000.00	2000.00	2000.00	2000.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	285.71	571.43
	Net loan - Opening	2000.00	2000.00	2000.00	1714.29	1428.57
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	2000.00	2000.00	2000.00	1714.29	1428.57
	Repayments of Loans during the period	0.00	0.00	285.71	285.71	285.71
	Net loan - Closing	2000.00	2000.00	1714.29	1428.57	1142.86
	Average Net Loan	2000.00	2000.00	1857.14	1571.43	1285.71
	Rate of Interest on Loan	6.7698%	6.7698%	6.7698%	6.7698%	6.7698%
	Interest on Loan Annualised	135.40	135.40	125.72	106.38	87.04
20	**JPY Equ. $400 Million Drawl I - Repayment wef August 2027**					
	Gross loan - Opening	700.00	700.00	700.00	700.00	700.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	100.00
	Net loan - Opening	700.00	700.00	700.00	700.00	600.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	700.00	700.00	700.00	700.00	600.00
	Repayments of Loans during the period	0.00	0.00	0.00	100.00	100.00
	Net loan - Closing	700.00	700.00	700.00	600.00	500.00
	Average Net Loan	700.00	700.00	700.00	650.00	550.00
	Rate of Interest on Loan	1.2155%	1.2155%	1.2155%	1.2155%	1.2155%
	Interest on Loan Annualised	8.51	8.51	8.51	7.90	6.69
21	**JPY Equ. $400 Million Drawl IV - Repayment wef Aug 2027**					
	Gross loan - Opening	400.00	400.00	400.00	400.00	400.00
	Cumulative repayments of Loans upto previous period	0.00	0.00	0.00	0.00	57.14
	Net loan - Opening	400.00	400.00	400.00	400.00	342.86
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	400.00	400.00	400.00	400.00	342.86
	Repayments of Loans during the period	0.00	0.00	0.00	57.14	57.14
	Net loan - Closing	400.00	400.00	400.00	342.86	285.71
	Average Net Loan	400.00	400.00	400.00	371.43	314.29
	Rate of Interest on Loan	1.2222%	1.2222%	1.2222%	1.2222%	1.2222%
	Interest on Loan Annualised	4.89	4.89	4.89	4.54	3.84
	TOTAL LOAN					
	Gross loan - Opening	2,24,475	2,24,475	2,24,475	2,24,475	2,24,475
	Cumulative repayments of Loans upto previous period	42,449	63,976	85,795	1,09,034	1,32,788
	Net loan - Opening	1,82,026	1,60,499	1,38,680	1,15,441	91,687
	Increase/ Decrease due to FERV	-	-	-	-	-
	Increase/ Decrease due to ACE/Drawl during the period	-	-	-	-	-
	Total	1,82,026	1,60,499	1,38,680	1,15,441	91,687
	Repayments of Loans during the period	21,527	21,819	23,239	23,754	23,754
	Net loan - Closing	1,60,499	1,38,680	1,15,441	91,687	67,933

Sl. no.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Average Net Loan	1,71,262	1,49,589	1,27,061	1,03,564	79,810
	Rate of Interest on Loan	7.9610%	7.9275%	7.8885%	7.8450%	7.7829%
	Interest on Loan Annualised	13,634	11,859	10,023	8,125	6,211
1	**State Bank of India-XI - D00006-Repayment from 01.10.2022**					
	Gross loan - Opening	185000	185000	185000	185000	185000
	Cumulative repayments of Loans upto previous period	41111	61667	82222	102778	123333
	Net loan - Opening	143889	123333	102778	82222	61667
	Increase/ Decrease due to FERV	0	0	0	0	0
	Increase/ Decrease due to ACE/Drawl during the period	0	0	0	0	0
	Total	143889	123333	102778	82222	61667
	Repayments of Loans during the period	20556	20556	20556	20556	20556
	Net loan - Closing	123333	102778	82222	61667	41111
	Average Net Loan	133611.11	113055.56	92500.00	71944.44	51388.89
	Rate of Interest on Loan	8.2000%	8.2000%	8.2000%	8.2000%	8.2000%
	Interest on Loan Annualised	10956.11	9270.56	7585.00	5899.44	4213.89
2	**State Bank of India-XI -D00008- Repayment from 01.10.2022**					
	Gross loan - Opening	4200.00	4200.00	4200.00	4200.00	4200.00
	Cumulative repayments of Loans upto previous period	933.33	1400.00	1866.67	2333.33	2800.00
	Net loan - Opening	3266.67	2800.00	2333.33	1866.67	1400.00
	Increase/ Decrease due to FERV	0.00	0.00	0.00	0.00	0.00
	Increase/ Decrease due to ACE/Drawl during the period	0.00	0.00	0.00	0.00	0.00
	Total	3266.67	2800.00	2333.33	1866.67	1400.00
	Repayments of Loans during the period	466.67	466.67	466.67	466.67	466.67
	Net loan - Closing	2800.00	2333.33	1866.67	1400.00	933.33
	Average Net Loan	3033.33	2566.67	2100.00	1633.33	1166.67
	Rate of Interest on Loan	8.2000%	8.2000%	8.2000%	8.2000%	8.2000%
	Interest on Loan Annualised	248.73	210.47	172.20	133.93	95.67
3	**State Bank of India-XI -TOTAL- Repayment from 01.10.2022**					
	Gross loan - Opening	1,89,200	1,89,200	1,89,200	1,89,200	1,89,200
	Cumulative repayments of Loans upto previous period	21,022	21,022	21,022	21,022	21,022
	Net loan - Opening	1,68,178	1,68,178	1,68,178	1,68,178	1,68,178
	Increase/ Decrease due to FERV	-	-	-	-	-
	Increase/ Decrease due to ACE/Drawl during the period	-	-	-	-	-
	Total	1,68,178	1,68,178	1,68,178	1,68,178	1,68,178
	Repayments of Loans during the period	21,022	21,022	21,022	21,022	21,022
	Net loan - Closing	1,47,156	1,47,156	1,47,156	1,47,156	1,47,156
	Average Net Loan	1,36,644	1,15,622	94,600	73,578	52,556
	Rate of Interest on Loan	8.2000%	8.2000%	8.2000%	8.2000%	8.2000%
	Interest on Loan Annualised	11,205	9,481	7,757	6,033	4,310

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Apr-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	25406.34	12907.75	-
2	Value of Stock	Rs.	88031465.99	53345671.86	-
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	245776.18	3724	-
	- Qty Received (Pit Head)	(MT)			
	- Qty Received (Non Pit Head)	(MT)			
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0	0	-
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	245776.18	3724.00	-
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1966.21	29.79	-
	- Normative Loss (Pit Head)	(MT)			
	- Normative Loss (Non Pit Head)	(MT)			
7	Net Coal / Lignite supplied (5-6)	(MT)	243809.97	3,694.21	-
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	597607733.3	10319144	-
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0	0	-
10	Handling Sampling and such other similar Charges	(Rs.)	9957071.47	150869.52	-
11	Total amount charged (8+9+10)	(Rs.)	607564805	1,04,70,013.52	-
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	228137321	3152748	-
	By Road	(Rs.)	7242392.04	109736.7	-
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)			
14	Demurrage charges, if any	(Rs.)			
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	136783.25	2072.54	-
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	235516496	32,64,557.24	-
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	843081301.04	13734570.76	-
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3458.60**	**4040.50**	
19	Blending Ratio (Domestic/Imported)	%	100%	0%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3,458.60**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5239	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	4901	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3641	2573	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3523	2923	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			**0**
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			**0**
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3534**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			May-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	49331.31	762.95	0
2	Value of Stock	Rs.	170617499.7	3082719.82	0
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	222174.47	7878.29	0
	- Qty Received (Pit Head)	(MT)	0	0	0
	- Qty Received (Non Pit Head)	(MT)	0	0	0
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	222174.47	7878.29	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1777.40	63.03	0.00
	- Normative Loss (Pit Head)	(MT)	0	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	220397.07	7,815.26	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	551215013	26414100	0
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0	0	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	10677359.01	378618.35	0.00
11	Total amount charged (8+9+10)	(Rs.)	561892372.01	26792718.35	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	196604252	6593581	-
	By Road	(Rs.)	7090002.16	251410.94	-
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)			
14	Demurrage charges, if any	(Rs.)			
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	333725.71	11833.89	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	204027979.87	6856825.83	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	765920351.88	33649544.18	0.00
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3472.15**	**4282.04**	
19	Blending Ratio (Domestic/Imported)	%	100%	0%	0%
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3472.15**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5163	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	5101	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3534	2651	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3496	3197	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3503**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Jun-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	46654.39	544.22	0.00
2	Value of Stock	Rs.	161991101.06	2330363.50	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	173488.71	51320.14	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	173488.71	51320.14	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1387.91	410.56	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	172100.80	50,909.58	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	439326909.68	238101950.75	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	10287299.46	3043112.42	0.00
11	Total amount charged (8+9+10)	(Rs.)	449614209	24,11,45,063.17	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	157049764.52	52698908.00	0.00
	By Road	(Rs.)	4756116.51	1406919.02	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)			
14	Demurrage charges, if any	(Rs.)			
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	383117.11	113330.86	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	162188998.14	54219157.88	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	611803207.28	295364221.05	-
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3537.26**	**5785.67**	
19	Blending Ratio (Domestic/Imported)	%	100%	0%	0%
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3537.26**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5106	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	5179	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3503	3148	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3568	3516	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3553**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Jul-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	24448.19	35263.80	0.00
2	Value of Stock	Rs.	86479628.51	204024620.47	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	228033.57	3896.98	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	228033.57	3896.98	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1824.27	31.18	0.00
	- Normative Loss (Pit Head)	(MT)			
	- Normative Loss (Non Pit Head)	(MT)			
7	Net Coal / Lignite supplied (5-6)	(MT)	226209.30	3,865.80	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	574054602.61	5130483.25	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	250759.38	4285.35	0.00
11	Total amount charged (8+9+10)	(Rs.)	574305361.99	5134768.60	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	204691427.00	3603829.00	0.00
	By Road	(Rs.)	4142184.14	70787.86	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)			
14	Demurrage charges, if any	(Rs.)			
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	279652.26	4779.12	-
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	209113263.40	3679395.98	-
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	783418625.39	8814164.58	-
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3470.47**	**5439.33**	
19	Blending Ratio (Domestic/Imported)	%	100.00%	0.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3470.47**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5178.00	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	5201.00	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3553	3512.00	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3271	3758.00	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0.000
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3299**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Aug-23		
SL.NO.	PARTICULARS	Unit	Domestic Coal		Imported Coal
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported Coal
A	OPENING QUANTITY				
1	Opening Quantity of Coal	(MT)	46,484.49	24,495.60	0.00
2	Value of Stock	Rs.	16,13,22,827.08	13,32,39,640.63	0.00
B	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	149656.62	3925.45	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	149656.62	3925.45	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1197.25	31.40	0.00
	- Normative Loss (Pit Head)	(MT)			
	- Normative Loss (Non Pit Head)	(MT)			
7	Net Coal / Lignite supplied (5-6)	(MT)	148459.37	3,894.05	0.00
C	PRICE				
8	Amount charged by the Coal / Lignite Company	(Rs.)	376176917.63	15710967.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	5064375.44	132837.11	0.00
11	Total amount charged (8+9+10)	(Rs.)	381241293.07	15843804.11	0.00
D	TRANSPORTATION				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	139169880.00	3491187.00	0.00
	By Road	(Rs.)	3341324.03	87641.97	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)			
14	Demurrage charges, if any	(Rs.)			
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	387469.93	10163.22	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	142898673.96	3588992.19	-
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	524139967.03	19432796.30	-
E	TOTAL COST				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3516.21**	**5377.75**	
19	Blending Ratio (Domestic/Imported)	%	100.00%	0.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3516.21**
F	QUALITY				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5180	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	5201	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3299	3536	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3390	4066	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3369**

FORM- 15 COAL

Name of the Petitioner: NTPC Limited

Name of the Generating Station : Barauni Stage-II (2X250MW)

Sep-23

SL.NO.	PARTICULARS	Unit	Domestic Coal		Imported Coal
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported Coal
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	73094.85	28389.65	0.00
2	Value of Stock	Rs.	257016582.28	152672436.93	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	57135.63	132.00	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	57135.63	132.00	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	457.09	1.06	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	56678.54	130.94	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	149314069.00	415535.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	12356824.03	28547.87	0.00
11	Total amount charged (8+9+10)	(Rs.)	16,16,70,893.03	4,44,082.87	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	53682648.00	95981.00	0.00
	By Road	(Rs.)	1986517.56	4589.44	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	321141.55	741.93	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	55990307.11	101312.37	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	217661200.14	545395.24	0.00
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3657.74**	**5372.18**	
19	Blending Ratio (Domestic/Imported)	%	85.00%	15.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3914.91**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5183	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	5201	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4689
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3369	3609	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3709	4510	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3542**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Oct-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	63029.40	16742.59	0.00
2	Value of Stock	Rs.	230545363.67	89944263.02	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	138669.63	7863.89	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	138669.63	7863.89	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1109.36	62.91	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	137560.27	7,800.98	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	348919104.58	17084084.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	1634015.01	92664.23	0.00
11	Total amount charged (8+9+10)	(Rs.)	350553119.59	17176748.23	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	127042225.52	9940352.00	0.00
	By Road	(Rs.)	0.00	0.00	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	196382.68	11136.77	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	127238608.20	9951488.77	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	477791727.79	27128237.00	0.00
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3531.27**	**4769.99**	
19	Blending Ratio (Domestic/Imported)	%	90.00%	10.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3655.15**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	5185	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	4312	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4632
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3510	3720	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3540	2950	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3525**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Nov-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	20322.67	4513.57	0.00
2	Value of Stock	Rs.	71764924.52	21529670.44	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	201846.53	0.00	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	201846.53	0.00	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1614.77	0.00	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	200231.76	0.00	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	508890209.90	0.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	10315600.26	0.00	0.00
11	Total amount charged (8+9+10)	(Rs.)	519205810.16	0.00	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	184726344.54	0.00	0.00
	By Road	(Rs.)	5922025.99	0.00	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	0.00	0.00	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	190648370.53	0.00	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	709854180.69	0.00	0.00
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3543.88**	**4769.99**	
19	Blending Ratio (Domestic/Imported)	%	100.00%	0.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3543.88**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	4906	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	0	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4601
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3531	3475	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3724	0	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3703**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Dec-23		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	50220.43	4513.57	0.00
2	Value of Stock	Rs.	177975331.06	21529670.44	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	204896.41	15135.19	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	204896.41	15135.19	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1639.17	121.08	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	203257.24	15,014.11	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	517774574.31	55021389.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	15397878.78	1137403.14	0.00
11	Total amount charged (8+9+10)	(Rs.)	533172453.09	56158792.14	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			
	By Rail	(Rs.)	189829080.54	16977623.00	0.00
	By Road	(Rs.)	10278140.92	759220.80	0.00
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	655060.43	48387.69	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	200762281.89	17785231.49	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	733934734.98	73944023.63	0.00
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3597.60**	**4889.15**	
19	Blending Ratio (Domestic/Imported)	%	86.00%	14.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3778.41**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	4906	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	4142	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4561
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3703	3475	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3643	3221	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3603**

				FORM- 15 COAL	
Name of the Petitioner: NTPC Limited					
Name of the Generating Station : Barauni Stage-II (2X250MW)					
			Jan-24		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	155665.67	3604.68	0.00
2	Value of Stock	Rs.	560022076.25	17623805.68	0.00
B	**QUANTITY**				
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	141449.06	15349.49	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	141449.06	15349.49	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1131.59	122.80	0.00
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	140317.47	15,226.69	0.00
C	**PRICE**				
8	Amount charged by the Coal / Lignite Company	(Rs.)	357330387.98	37490728.00	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	3675259.09	398824.51	0.00
11	Total amount charged (8+9+10)	(Rs.)	361005647.07	37889552.51	0.00
D	**TRANSPORTATION**				
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			0.00
	By Rail	(Rs.)	129988009.00	19449311.00	0
	By Road	(Rs.)	0	0.00	-
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	222081.34	24099.39	0.00
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	130210090.34	19473410.39	0.00
17	Other Charges	(Rs.)			
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	491215737.41	57362962.90	-
E	**TOTAL COST**				
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3551.68**	**3982.01**	
19	Blending Ratio (Domestic/Imported)	%	92.00%	8.00%	
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)			**3586.11**
F	**QUALITY**				
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	4318	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	3550	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)			4529
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3656	3280	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3578	3253	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)			**3590**

				FORM- 15 COAL			FORM- 15 COAL	
Name of the Petitioner: NTPC Limited								
Name of the Generating Station : Barauni Stage-II (2X250MW)								
			Feb-24			**Mar-24**		
SL.NO.	**PARTICULARS**	**Unit**	**Domestic Coal**		**Imported Coal**	**Domestic Coal**		**Imported Coal**
			Domestic (NTPC Mines)	**Domestic (Other Sources)**	**Imported Coal**	**Domestic (NTPC Mines)**	**Domestic (Other Sources)**	**Imported Coal**
A	**OPENING QUANTITY**							
1	Opening Quantity of Coal	(MT)	106720.14	2373.37	0.00	111368.30	10,775.22	0.00
2	Value of Stock	Rs.	379035928.43	9450801.98	0.00	396750377.66	4,54,99,885.24	0.00
B	**QUANTITY**							
3	Quantity of Coal/Lignite supplied by Coal / Lignite Company	(MT)	188761.25	40953.47	0.00	2,06,974.27	14,255.59	0.00
	- Qty Received (Pit Head)	(MT)	0.00	0.00	0.00	-	0.00	0.00
	- Qty Received (Non Pit Head)	(MT)	0.00	0.00	0.00	-	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal / Lingite Company	(MT)	0.00	0.00	0.00	0.00	0.00	0.00
5	Coal supplied by Coal / Lingite Company(3+/-4)	(MT)	188761.25	40953.47	0.00	206974.27	14,255.59	0.00
6	Normative Transit & Handling Losses (for Coal / Lignite based projects	(MT)	1510.09	327.63	0.00	1655.79	114.04	76.32
	- Normative Loss (Pit Head)	(MT)	0.00	0.00	0.00	0.00	0.00	0.00
	- Normative Loss (Non Pit Head)	(MT)	0.00	0.00	0.00	0.00	0.00	0.00
7	Net Coal / Lignite supplied (5-6)	(MT)	187251.16	40,625.84	0.00	205318.48	14,141.55	-76.32
C	**PRICE**							
8	Amount charged by the Coal / Lignite Company	(Rs.)	47,80,72,323.62	12,11,15,774.00	0.00	52,35,95,801.90	7,17,55,759.60	0.00
9	Adjustment (+/-) in amount charged by Coal / Lignite Company	(Rs.)	0.00	0.00	0.00	0.00	0.00	0.00
10	Handling Sampling and such other similar Charges	(Rs.)	67,25,624.88	14,59,185.49	0.00	1,20,84,207.68	8,32,313.65	0.00
11	Total amount charged (8+9+10)	(Rs.)	48,47,97,948.50	12,25,74,959.49	0.00	535680009.58	72588073.25	0.00
D	**TRANSPORTATION**							
12	Transportation charges by Rail/Ship/Road Transport	(Rs.)			0			0
	By Rail	(Rs.)	172476987.2	4,71,65,815.00	-	192608603	1,29,29,663.00	-
	By Road	(Rs.)	10543193.05	22,87,441.62	-	6896769.08	4,75,022.87	-
13	Adjustment (+/-) in amount charged by Railways / Transport Company	(Rs.)	0	0	0	0	0	0
14	Demurrage charges, if any	(Rs.)	0	-	-	0	-	-
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)	420854.95	91308.31	-	470045.58	32374.93	-
16	Total Transportation Charges (12+/-13 - 14 + 15)	(Rs.)	183441035.19	49544564.93	0.00	199975417.66	13437060.80	0.00
17	Other Charges	(Rs.)						
18	Total amount charged for coal / Lignite supplied including transportation (11 +16)	(Rs.)	66,82,38,983.69	17,21,19,524.42	-	735655427.24	86025134.05	-
E	**TOTAL COST**							
18	Landed Cost of Coal/Lignite. (2+17)/(1+7)	(Rs./MT)	**3562.51**	**4222.64**		**3575.79**	**5278.58**	**0.00**
19	Blending Ratio (Domestic/Imported)	%	85.00%	15.00%		93.00%	7.00%	0.00%
20	Weighted Average Cost of Coal or Lignite	(Rs./MT)	**3661.53**			**3694.99**		
F	**QUALITY**							
21	GCV of Domestic Coal of the Opening Coal Stock as per Bill of Coal Company	(Kcal / Kg)	4601	3696		4601	4276	
22	GCV of Domestic Coal Supplied as per Bill of Coal Company	(Kcal / Kg)	4601	4310		4601	5048	
23	GCV of Imported Coal of the Opening Stock as per Bill of Coal Company	(Kcal / Kg)			0			0
24	GCV of Imported Coal Supplied as per Bill of Coal Company	(Kcal / Kg)			0			0
25	Weighted average GCV of coal/ Lignite as Billed	(Kcal / Kg)	4552			4609		
26	GCV of Domestic Coal of the Opening Stock as Received at Station	(Kcal / Kg)	3619	3258		3617	3036	
27	GCV of Domestic Coal Supplied as Received at Station	(Kcal / Kg)	3616	3023		3712	3118	
28	GCV of Imported Coal of the Opening Stock as Received at Station	(Kcal / Kg)			0			0
29	GCV of Imported Coal Supplied as Received at Station	(Kcal / Kg)			0			0
30	Weighted average GCV of coal/ Lignite as Received	(Kcal / Kg)	**3530**			**3636**		

FORM- 15 -OIL

Name of the Petitioner: NTPC Limited

Name of the Generating Station : Barauni Stage-II (2X250 MW)

S.No.	Particulars	Unit	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24
	Month		**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**	**LDO**
1	Opening Stock of Oil	KL	5815.64	4356.64	3097.64	2073.64	3964.87	3693.87	0.73	0.73	2316.08	5186.31	4657.31	4552.31
2	Value of Opening Stock	Rs.	474988633	355825834	252997895	169363415	295233353	275054089	58016	58016	158819922.00	378527095	339917596	332254084
3	Quantity of Oil supplied by Oil Company	KL	0.00	0.00	0.00	2970.23	0.00	0.00	0.00	3161.35	2970.23	0.00	0.00	0.00
4	Adjustment (+/-) in quantity supplied by Oil Company	KL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Qty. of Oil supplied by Oil Company (3+4)	KL	0.000	0.000	0.000	2970.230	0.000	0.000	0.000	3161.350	2970.23	0.000	0.000	0.000
6	Normative Transit & Handling Losses	KL	0	0	0	0	0	0	0	0	0.00	0	0	0
7	Net Oil Supplied (5 - 6)	KL	0.000	0.000	0.000	2970.230	0.000	0.000	0.000	3161.350	2970.23	0.000	0.000	0.000
8	Amount charged by the Oil Company	Rs.	0	0	0	206214682	0	0	0	216774433.38	226564446.13	0	0	0
9	Adjustment (+/-) in amount charged by Oil Company	Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Total amount charged (8+9+10)	Rs.	0	0	0	206214682	0	0	0	216774433.38	226564446.13	0	0	0
12	Transportation charges by rail/ship/road transport	Rs.	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive
13	Adjustment (+/-) in amount charged by	Rs.												
	Railways/Transport Company.													
14	Demurrage charges, if any	Rs.												
15	Total Transportation Charges (12+13+14+15)	Rs.												
16	Others	Rs.	0	0	0	0	0	0	0	0	0	0	0	0
17	**Total amount charged for Oil supplied including Transportation (11+15+16)**	Rs.	0	0	0	206214682	0	0	0	216774433.38	226564446.13	0	0	0
18	**Weighted average cost of Oil**	Rs./ KL	**81674.3**	**81674.30**	**81674.30**	**74462.23**	**74462.23**	**74462.23**	**79473.32**	**68572.73**	**72902.34**	**72985.82**	**72985.82**	**72985.82**
19	GCV of Oil of the opening stock	Kcal/KL	9270	9270	9270	9270	9312	9312	9312	9187	9187	9187	9187	9187
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9270**	**9270**	**9270**	**9312**	**9312**	**9312**	**9312**	**9187**	**9187**	**9187**	**9187**	**9187**

Computation of Energy Charges

Form-15B

ADDITIONAL FORM

Name of the Petitioner: NTPC Limited

Name of the Generating Station : Barauni (2x250 MW)

											2024-25	**2025-26**	**2026-27**	**2027-28**	**2028-29**		
							No of Days in the year		Days		365	365	365	366	365		
Computation of Energy Charges							Sp. Oil consumption		ml/kwh		0.5	0.5	0.5	0.5	0.5		
							Auxiliary consumption		%		9.80	9.80	9.80	9.80	9.80		
1	Rate of Energy Charge from Sec. Fuel Oil/ Alternate Fuel (p/kwh)						Heat Rate		Kcal/Kwh		2,388.38	2,388.38	2,388.38	2,388.38	2,388.38		
					3.785		**Computation of Variable Charges**										
							Variable Charge (Coal)		p/kwh		276.558	276.558	276.558	276.558	276.558		
							Variable Charge (Oil)		p/kwh		4.196	4.196	4.196	4.196	4.196		
2	Heat Contribution from SFO / Alternate Fuel				4.625		**Total**		p/kwh		280.754	280.754	280.754	280.754	280.754		
							Price of fuel from Form-15/15A										
							Coal Cost		(Rs./MT)		3607.47	3607.47	3607.47	3607.47	3607.47		
3	Heat Contribution from coal				2383.76		Oil Cost		(Rs./KL)		75692.95	75692.95	75692.95	75692.95	75692.95		
4	Specific Primary Fuel Consumption				0.691		**Computation of Fuel Expenses for Calculation of IWC:**										
							ESO in a year		(MUs)		3358.15	3358.15	3358.15	3367.35	3358.15		
							ESO for	50 days	(MUs)		460.020	460.020	460.020	460.020	460.020		
5	Rate of Energy charge from Primary Fuel (p/kwh)				249.455		Cost of coal for 50 Days		(Rs. Lakh)		12722.21	12722.21	12722.21	12722.21	12722.21		
							Cost of oil for 2 months		(Rs. Lakh)		234.84	234.84	234.84	235.48	234.84		
							Energy Expenses for 45 days		(Rs. Lakh)		11623.70	11623.70	11623.70	11623.70	11623.70		
6	Rate of Energy charge ex-bus (p/kWh)				280.754												

	Coal		**April '23**	**May'23**	**June'23**	**July'23**	**Aug'23**	**Sep'23**	**Oct'23**	**Nov'23**	**Dec'23**	**Jan'24**	**Feb'24**	**Mar'24**	**Wtd. Avg.**
	Wtd. Avg. Price of Coal	Rs./MT	3458.60	3472.15	3537.26	3470.47	3516.21	3914.91	3655.15	3543.88	3778.41	3586.11	3661.53	3694.99	**3607.47**
	Wtd. Avg. GCV of Coal as received	kCal/Kg	3534.00	3503.00	3553.00	3299.00	3369.00	3542.00	3525.00	3703.00	3603.00	3590.00	3530.00	3636.00	**3532.25**
	Wtd. Avg. GCV of Coal as received	kCal/Kg	3449	3418	3468	3214	3284	3457	3440	3618	3518	3505	3445	3551	**3447.25**
	Secondary Oil														
	Wtd. Avg. Price of Secondary Fuel	Rs/KL	81674.30	81674.30	81674.30	74462.23	74462.23	74462.23	79473.32	68572.73	72902.34	72985.82	72985.82	72985.82	**75692.95**
	Wtd. Avg. GCV of Secondary Fuel	kCal/L	9270.00	9270.00	9270.00	9312.00	9312.00	9312.00	9312.00	9187.00	9187.00	9187.00	9187.00	9187.00	**9,249.42**

Petitioner

PART 1
FORM- L

Name of the Petitioner **NTPC Ltd**
Name of the Generating Station **Barauni (2x250 MW)**

Statement of Capital cost
(To be given for relevant dates and year wise)

(Amount in Rs. Lakh)

S. No.	Particulars	2024-25		
		Accrual Basis	Un-discharged Liabilities	Cash Basis
A	a) Opening Gross Block Amount as per books	325315.55	21786.61	303528.94
	b) Amount of IDC in A(a) above	31820.28	0.00	31820.28
	c) Amount of FC in A(a) above	0.00	0.00	0.00
	d) Amount of FERV in A(a) above	0.00	0.00	0.00
	e) Amount of Hedging Cost in A(a) above	0.00	0.00	0.00
	f) Amount of IEDC in A(a) above	7840.05	0.00	7840.05
B	a) Addition in Gross Block Amount during the period (Direct purchases)	SHALL BE PROVIDED AT THE TIME OF TRUE-UP.		
	b) Amount of IDC in B(a) above			
	c) Amount of FC in B(a) above			
	d) Amount of FERV in B(a) above			
	e) Amount of Hedging Cost in B(a) above			
	f) Amount of IEDC in B(a) above			
C	a) Addition in Gross Block Amount during the period (Transferred from CWIP)			
	b) Amount of IDC in C(a) above			
	c) Amount of FC in C(a) above			
	d) Amount of FERV in C(a) above			
	e) Amount of Hedging Cost in C(a) above			
	f) Amount of IEDC in C(a) above			
D	a) Deletion in Gross Block Amount during the period			
	b) Amount of IDC in D(a) above			
	c) Amount of FC in D(a) above			
	d) Amount of FERV in D(a) above			
	e) Amount of Hedging Cost in D(a) above			
	f) Amount of IEDC in D(a) above			
E	a) Closing Gross Block Amount as per books			
	b) Amount of IDC in E(a) above			
	c) Amount of FC in E(a) above			
	d) Amount of FERV in E(a) above			
	e) Amount of Hedging Cost in E(a) above			
	f) Amount of IEDC in E(a) above			

(Petitioner)

PART 1
FORM- M

Name of the Petitioner **NTPC Ltd**
Name of the Generating Station **Barauni (2x250 MW)**

Statement of Capital Woks in Progress

(Amount in Rs. Lakh)

S. No.	Particulars	2024-25		
		Accrual Basis	Un-discharged Liabilities	Cash Basis
A	a) Opening CWIP as per books	16302.86	1652.78	14650.08
	b) Amount of IDC in A(a) above	504.49	0.00	504.49
	c) Amount of FC in A(a) above	0.00	0.00	0.00
	d) Amount of FERV in A(a) above	0.00	0.00	0.00
	e) Amount of Hedging Cost in A(a) above	0.00	0.00	0.00
	f) Amount of IEDC in A(a) above	83.57	0.00	83.57
B	a) Addition in CWIP during the period			
	b) Amount of IDC in B(a) above			
	c) Amount of FC in B(a) above			
	d) Amount of FERV in B(a) above			
	e) Amount of Hedging Cost in B(a) above			
	f) Amount of IEDC in B(a) above			
C	a) Transferred to Gross Block Amount during the period			
	b) Amount of IDC in C(a) above			
	c) Amount of FC in C(a) above			
	d) Amount of FERV in C(a) above			
	e) Amount of Hedging Cost in C(a) above			
	f) Amount of IEDC in C(a) above			
D	a) Deletion in CWIP during the period			
	b) Amount of IDC in D(a) above			
	c) Amount of FC in D(a) above			
	d) Amount of FERV in D(a) above			
	e) Amount of Hedging Cost in D(a) above			
	f) Amount of IEDC in D(a) above			
E	a) Closing CWIP as per books			
	b) Amount of IDC in E(a) above			
	c) Amount of FC in E(a) above			
	d) Amount of FERV in E(a) above			
	e) Amount of Hedging Cost in E(a) above			
	f) Amount of IEDC in E(a) above			

SHALL BE PROVIDED AT THE TIME OF TRUE-UP.

(Petitioner)

PART-I
FORM- N

Calculation of Interest on Normative Loan

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Barauni (2x250 MW)**

(Amount in Rs Lakh)

S. No.	Particulars	*Existing 2023-24*	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	*3*	4	5	6	7	8
1	Gross Normative loan – Opening	*2,00,732.12*	2,12,678.30	2,29,528.00	2,39,633.70	2,44,605.35	2,44,605.35
2	Cumulative repayment of Normative loan up to previous year	*33,705.36*	48,497.55	64,433.42	81,340.69	98,791.30	1,16,421.08
3	**Net Normative loan – Opening**	*1,67,026.75*	1,64,180.75	1,65,094.57	1,58,293.01	1,45,814.05	1,28,184.27
4	Add: Increase due to addition during the year / period	*11388.76*	16,849.69	10,105.71	4,971.65	-	-
5	Less: Decrease due to de-capitalisation during the year / period	*-430.63*	-	-	-	-	-
6	Less: Decrease due to reversal during the year / period		-	-	-	-	-
7	Add: Increase due to discharges during the year / period	*988.05*	-	-	-	-	-
8	Net addition in loan during the period (4+5+6+7)	*11946.19*	16849.69	10105.71	4971.65	0.00	0.00
9	Less: Repayment of Loan	*14887.57*	15,935.87	16,907.27	17,450.61	17,629.78	17,629.78
10	Repayment adjustment on account of de capitalisation	*95.38*	-	-	-	-	-
11	Repayment adjustment on account of discharges/reversals corresponding to un discharged liabilities deducted as on 1.4.2009	-	-	-	-	-	-
12	**Net Normative loan - Closing**	*1,64,180.75*	1,65,094.57	1,58,293.01	1,45,814.05	1,28,184.27	1,10,554.50
13	**Average Normative loan**	*1,65,603.75*	1,64,637.66	1,61,693.79	1,52,053.53	1,36,999.16	1,19,369.38
14	Weighted average rate of interest	*7.9441*	7.9610	7.9275	7.8885	7.8450	7.7829
15	**Interest on Loan**	***13155.73***	**13106.80**	**12818.28**	**11994.74**	**10747.58**	**9290.40**

(Petitioner)

PART 1
FORM- O

Calculation of Interest on Working Capital

Name of the Company :		**NTPC Ltd**					
Name of the Power Station :		**Barauni (2x250 MW)**					
							(Amount in Rs Lakh)
S. No.	**Particulars**	***2023-24***	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**
1	**2**						
1	Cost of Coal/Lignite	*12748.75*	12722.21	12722.21	12722.21	12722.21	12722.21
2	Cost of Main Secondary Fuel Oil	*254.72*	234.84	234.84	234.84	235.48	234.84
3	Fuel Cost						
4	Liquid Fuel Stock						
5	O & M Expenses	*1842.46*	2048.73	2162.20	2282.16	2409.29	2543.41
6	Maintenance Spares	*4421.91*	4916.96	5189.28	5477.18	5782.31	6104.19
7	Receivables	*20459.99*	21029.54	21422.61	21643.12	21700.72	21754.57
8	Total Working Capital	*39727.82*	40952.28	41731.13	42359.50	42850.01	43359.21
9	Rate of Interest	*12.0000*	11.9000	11.9000	11.9000	11.9000	11.9000
10	**Interest on Working Capital**	***4767.34***	**4873.32**	**4966.00**	**5040.78**	**5099.15**	**5159.75**

Petitioner

PART 1
FORM-T

Summary of issue involved in the petition

Name of the Company :		**NTPC Limited**
Name of the Power Station :		**Barauni (2x250 MW)**
1	**Petitioner:**	**NTPC Limited**
2	**Subject**	Petition Under Section 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-III of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 2023 and Chapter-3, Regulation-9 of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for approval of tariff of Barauni Thermal Power Station, Stage-II (2 X 250MW) for the period from 01.04.2024 to 31.03.2029.
3		i)Approve tariff of Barauni Thermal Power Station Stage-II (2x250 MW) for the tariff period 01.04.2024 to 31.03.2029. ii) Allow the recovery of filing fees as & when paid to the Hon'ble Commission and publication expenses from th beneficiaries. iii) Allow the work beyond cut-off date for the instant station under Regulation-102 of CERC Tariff Regulations 2024 i.e. Power to relax. iv)Consider Station Heat Rate based on design heat Rate with applicable operating margin. v) Allow reimbursement of Ash Transportation Charges directly from the beneficiaries on monthly basis, subject to true up. vi) Grant liberty to approach the Hon'ble Commission to allow for the recovery of pay/wage revision due in 2024-2 period as additional O&M over and above the normative O&M. Allow for the recovery of pay/wage revision as additional O&M over and above the normative O&M. vii)Pass any other order as it may deem fit in the circumstances mentioned above.
4	**Respondents:**	
	Name of Respondents	
	a. North Bihar Power Distribution Company Ltd. (NBPDCL)	
	b. South Bihar Power Distribution Company Ltd. (SBPDCL)	
5	**Project Scope**	**(2x250) MW Thermal Power Station**
	Cost	
	Commissioning	
	Claim	**As per Petition**
	AFC (lakhs)	**Refer Form-1**
	Capital cost (lakhs) as on 01.04.2024	**Refer Form-1(1)**
	NAPAF (Gen)	**85%**
	Any Specific	

ANNEXURE-A

Annexure - A

GOVERNMENT OF BIHAR
ENERGY DEPARTMENT

NOTIFICATION

No. 05 Dated 25/05/2018

THE BIHAR POWER GENERATION UNDERTAKINGS TRANSFER SCHEME, 2018

In exercise of powers conferred under Sections 131, 134 and other applicable provisions of the Electricity Act, 2003, the Government of Bihar hereby makes the following Scheme for the purpose of transfer and vesting of properties, interests, rights, specified assets, specified liabilities and specified personnel concerning (a) Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar; (b) BSPGCL's equity contribution in Nabinagar Power Generating Company Private Limited (NPGCL) and (c) BSPGCL's equity contribution in Kanti Bijli Utpadan Nigam Limited (KUBNL), from BSPGCL to NTPC Limited.

The State Government hereby appoints (to be notified later) as the date of coming into force of 'The Bihar Power Genration Undertakings Transfer Scheme 2018' ("Transfer Scheme"), and as the Date of Transfer of above mentioned specified properties, interests, rights, assets, liabilities and personnel, from BSPGCL to NTPC Limited, a public Company limited by shares having registration no. CIN L40101DL1975GOI007966 dt. 07.11.1975.

WHEREAS in terms of the Memorandum of Understanding (MoU) dated 15.05.2018 executed by and amongst the Government of Bihar (hereinafter referred to as "GoB"), Bihar State Power Holding Company Ltd (hereinafter referred to as "BSPHCL"), Bihar State Power Generation Company Ltd (hereinafter referred to as "BSPGCL", Bihar State Power Transmission Company Ltd (hereinafter referred to as "BSPTCL"), North Bihar Power Distribution Company Ltd (hereinafter referred to as "NBPDCL"), South Bihar Power Distribution Company Ltd (hereinafter referred to as "SBPDCL") and NTPC

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Limited (hereinafter referred to as "NTPC"), hereinafter be collectively referred to as the "Parties" and individually be referred to as the 'Party'. GoB, BSPHCL, BSPGCL, BSPTCL, NBPDCL, and SBPDCL (hereinafter be collectively referred to as the "Parties of Bihar Govt."), have agreed to transfer and vest properties, interests, rights, specified assets, specified liabilities and specified personnel concerning (a) Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar; (b) BSPGCL's equity contribution in Nabinagar Power Generating Company Private Limited (NPGCL) and (c) BSPGCL's equity contribution in Kanti Bijli Utpadan Nigam Limited (KUBNL), from BSPGCL to NTPC Limited.

AND WHEREAS in pursuance of the said understanding reached, the Parties have agreed and / or are taking the following steps:

I. **NTPC would take over the assets of Barauni Thermal Power Station (BTPS), as mentioned below:**

a. Stage - I: NTPC shall takeover Stage-I (Unit# 6 and 7 - 2 X 110 MW) of BTPS on as-is where-is basis. Further, as the R&M of Stage-I is being carried out through grant from Central/State Government, the unutilized grant (by Niti Aayog and other sources, if any) will be transferred to NTPC to complete the balance R&M works; alternatively the payment will be released by BSPGCL. NTPC may further retain an additional amount for adjusting any contingency payment for utilizing towards completion of activities for Stage-I (details given in Point D, Part-II Schedule A). ;

b. Stage - II: NTPC shall takeover Stage-II (Unit# 8 and 9 - 2 X 250 MW) of BTPS. Balance Works shall be completed by NTPC, within 18 months on a best efforts basis. The cost to complete and Interest During Construction, precommissioning, overheads, financing charges etc. for Stage-II of BTPS and other liabilities shall be adjusted against total the transfer consideration of BTPS Assets.;

c. Any balance amount available with NTPC, as per the actual

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expenditure incurred, from the consideration amount retained with NTPC, post completion of activities and settlement of vendor payments, would be adjusted against the power purchase dues of the Bihar Discoms.;

d. Any additional expenditure required for completion of facility or compliance to environmental norms/regulatory/statutory order, subject to the approval of CERC, shall form part of capital cost for determination of Tariff as per Article IX b.

II. NTPC would buy-out the equity of BSPGCL in KBUNL;

III. NTPC would buy-out the equity of BSPGCL in NPGCL;

IV. Consideration to be paid by NTPC to BSPGCL for transfer of assets and equity buy-out would be as follows:

a. The Consideration of the BTPS Assets shall be as agreed between the Parties, subject to acceptance by CERC and will form the basis for determination of fixed charge of the tariff payable by the Bihar Discoms. NTPC, subject to adjustments if any, shall pay this value to BSPGCL as Transfer Consideration of BTPS Assets.

i. The consideration towards BTPS Assets, as agreed, shall also include the estimated cost to be incurred by NTPC towards completion of the Stage-II units to render them capable for sustained Commercial Operation which will include direct capital expenditure, Interest During Construction, precommissioning, overheads, financing charges etc.

ii. Parties agree that the decommissioned units of BTPS Stage-I (Unit # 1-5) along with associated scrap / inventory shall not form part of the consideration. These units shall be dismantled and disposed off (along with associated scrap/inventory in store) by NTPC at risk and cost of BSPGCL. NTPC is to ensure that these units are disposed off in the most efficient and effective manner with due care to realise their revenue

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potential appropriately. Proceeds realized from such disposal less administrative and incidental expenses towards this sale shall be to the account of GoB/BSPGCL, which upon realization can be adjusted against the receivables of NTPC from NBPDCL and SBPDCL.

b. The equity shares of BSPGCL in KBUNL and NPGCL, shall be acquired by NTPC at face value.

c. The net consideration for BTPS assets and equity buyout of KBUNL and NPGCL, shall be worked out after first adjusting the outstanding debt liabilities and dues of Bihar Discoms towards sale of Power by KBUNL to Bihar Discoms in the transfer consideration.

d. The total consideration for BTPS (including the cost to completion) would be considered for adjustment in the books of accounts of BSPGCL.

V. **Utilisation of funds:** The consideration received for BTPS and equity shares in KBUNL and NPGCL, would be utilised by BSPGCL for settling its outstanding debt including pre-payment charges, towards FIs / Banks first. Any balance consideration post settlement of debt obligations, would be utilised for adjustment of outstanding power purchase dues of the Bihar Discoms. The same has been detailed in Schedule A (Part-V).

VI. **Treatment of Power Purchase Agreements (PPAs):**

a. The existing power purchase arrangements would continue to be in force;

b. The PPA signed by BSPGCL with the Bihar Discoms for the BTPS shall be assigned to NTPC along with transfer of BTPS Assets through an Amended and Restated / Supplementry Power Purchase Agreement incorporating any other changes as required which shall include payment security mechanism provided by the Bihar Discoms to NTPC as per other PPAs of NTPC with Bihar Discoms.

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VII. **Water for BTPS:** GoB and BSPGCL shall ensure that the ongoing contingency scheme shall be suitably augmented to meet the requirement of BTPS Assets.

VIII. **Coal for BTPS:** BSPGCL shall apply to Ministry of Power, GoI (MOP) / Ministry of Coal, GoI (MOC) to facilitate transfer of following Coal linkages allocated to BTPS:

a. Existing Fuel Supply Agreement (FSA) with ECL for providing Annual Contracted Quantity of 1.1 MTPA coal for BTPS Stage- I including necessary permissions from the Standing Linkage Committee (Long Term), MoP/MoC on takeover of BTPS Stage-I by NTPC.

b. Assignment of existing Bridge Linkage of 1.07 MTPA for BTPS Stage- II from CCL mines.

c. Apply to MoP/MoC for allocation of coal for BTPS Stage-II under the SHAKTI scheme, 2017 of GoI.

d. Further on the matter of Badam coal block, which has been allotted to BSPGCL, it has been agreed between NTPC and BSPGCL that in view of the difficulties being faced by BSPGCL in development of the coal block, BSPGCL would surrender the coal block to the Ministry of Coal (MoC), Govt. of India. Consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.

IX. **Tariff determination:**

a. Upon the transfer and vesting of BTPS Assets in NTPC on the Asset Transfer Date, BTPS will be under the regulatory jurisdiction of the Central Electricity Regulatory Commission

(CERC) for determination of tariff as per Section 79(1)(a) of the Electricity Act, 2003.

b. For Badam coal block, post the surrender by BSPGCL, consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.

c. Any additional expenditure required for completion of facility or compliance to environmental norms/regulatory/statutory order, subject to the approval of CERC, shall form part of capital cost for determination of Tariff.

d. NTPC would exercise prudence check over the expenditure on BTPS units so as to keep the fixed charges of BTPS units within 10% of the estimated first year fixed charges in normal conditions, except legal, statutory & force majure conditions. NTPC will have to obtain prior approval from Govt. of Bihar against the project cost leading to increase in fixed charges beyond 10%.

1. ***Short Title, Extent and Commencement*** :-

1.1 This Scheme may be called "The Bihar Power Generation Undertakings Transfer Scheme, 2018".

1.2 The Scheme shall extend to the whole of the State of Bihar and shall include specified properties, interests, rights, assets of specified undertakings, wherever situated.

1.3 The Scheme shall be deemed to have come into force from the date of its publication in the official gazette.

2. ***Definitions - In the Scheme, unless the context otherwise requires*** :-

(a) "Act" means the Electricity Act, 2003 (36 of 2003) and any subsequent amendments thereto;

(b) **"Amended and Restated PPA"** means the Power Purchase Agreement to be entered into between NTPC and the Bihar Discoms in pursuance of the transfer and vesting of generating undertakings and interest therein to NTPC Limited in terms of this Scheme.

(c) **"Assets"** means all assets & properties including power systems, plant, machinery, appurtenant land, building, offices, stores, furniture, fixtures, vehicles, residential quarters and guest houses and amenities and installations pertaining and attached thereto and other movable and immovable assets, tangible and intangible assets, benefits, licenses, consents, authorities, registration, patents, trademarks and powers of every kind, nature and description whatsoever, privileges, liberties, easements, advantages, benefits and approvals, contracts, deeds, schemes, bonds, agreements, arrangements and other instruments and interest of whatever nature and wherever situated and including the contingent assets, which may arise in regard to dealings before the effective date of transfer in respect of and limited to the specified Undertakings as specified in this Scheme;

(d) **"Bihar DISCOMS"** means the North Bihar Power Disctribution Company Limited (NBPDCL) and the South Bihar Power Distribution Company Limited (SBPDCL), the two State Distribution Licensees in the State of Bihar;

(e) **'BSPGCL'** means Bihar State Power Generation Company Limited;

(f) **'BTPS'** means Barauni Thermal Power Station situated at Begusarai, Bihar.

(g) **"Effective Date of Transfer"** means the respective dates from which the transfer of each part of the Specified Undertakings or assets or interest are transferred to the Transferee by an order passed by the State Government for the said purpose;

(h) **"KBUNL"** means Kanti Bijlee Utpadan Nigam Limited, a Joint

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Venture Company of NTPC and BSPGCL;

(i) "Liabilities" means all liabilities, debts, duties, obligations and other out-standings including statutory liabilities and Government levies of whatever nature and contingent liabilities which may arise in regard to the dealings before the Effective Date of Transfer in respect of the Specified Undertakings, as specified in this Scheme finally transferred to the Transferee under this scheme;

(j) "MOU" means Memorandum of Understanding signed on 15.05.2018 amongst the Govt of Bihar, Bihar State Power Holding Company Ltd, Bihar State Power Generation Company Ltd, Bihar State Power Transmission Company Ltd, North Bihar Power distribution Company Limited, South Bihar Power Distribution Company Limited and NTPC Limited;

(k) "NPGCL" means the Nabinagar Power Generating Company Private Limited, a Joint Venture Company of NTPC and BSPGCL;

(l) "NTPC" means the NTPC Limited, a Government of India Undertaking;

(m) "PPA" means the Power Purchase Agreement signed or Power procurement arrangement existing between BSPGCL and the Bihar Discoms for BTPS Stage-I and Stage-II and to the extent relevant, the Power Purchase Agreement signed between Bihar DISCOMS and KBUNL, the Power Purchase Agreement signed between Bihar DISCOMS, and NPGCL;

(n) "Proceedings" means the proceedings of whatever nature including suits, appeals, complaints, petitions, applications, conciliation, arbitration whether civil or criminal or otherwise, in which the Transferor is one of the parties;

(o) "Schedules" means the Schedules appended to this Scheme;

(p) "Specified Liabilities" means only those liabilities given in Schedule B and shall not include any other liability by whatever name called and shall not extend to any contingent liabilities pertaining to the period prior to the Effective Date of Transfer;

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(q) Specified Personnel" means workmen, employees, staff and officers of the Transferor by whatever name called on the regular rolls of BTPS Stage-I and Stage-II as on the date of notification of this Scheme.

(r) 'Specified Undertaking" means the following: BTPS Stage-I and Stage-II situated at Begusarai, Bihar; (b) BSPGCL's equity shares in NPGCL and (c) equity shares held in KBUNL as set out in Schedule A to the Scheme;

(s) "State" means the State of Bihar;

(t) "State Government" means the Government of Bihar;

(u) "Transferor" in regard to BTPS Stage-I and Stage-II situated at Begusaria, Bihar and equity interest held in KBUNL and NPGCL;

(v) "Transferee" means NTPC;

(w) "Undertaking(s)" mean the functions, business and a block or blocks of properties, equity shares in generating company interest, rights, assets, obligations, proceedings to the extent and in the manner specified as a part of the undertakings of the Transferor and such other properties, interests, rights, assets, specified liabilities, specified Personnel as specified in this Scheme.

(x) Words and expressions which are used in the Scheme and also defined in the Act but not specifically defined in this Scheme shall have the same meaning as assigned to them in the Act.

3. *Transfer of Specified Undertaking:-*

3.1 On and from the Effective Date of Transfer, as notified by the State Government, the relevant Specified Undertaking, namely those listed in Schedule A alongwith Specified Liabilities as listed in Schedule B shall stand transferred from the relevant Transferor and vested in the Transferee without any further act or thing to be done by the State Government or the Transferor or the Transferee or any other person, subject however, to the terms and conditions specified in the Act and this Scheme. For the

associated land of BTPS, it is to be specifically noted that the appurtenant land would be given on a nominal lease for a period of 33 years from the effective transfer date to NTPC, and the ownership would continue to remain with BSPGCL / Government of Bihar.

It is also clarified that if in future NTPC undergoes any disinvestement and/or privatisation for any reason whatsoever, the lease of land in question will get transferred from one party to another and the ownership of land will remain with the BSPGCL/GoB.

3.2 On such transfer and vesting of the Specified Undertaking in terms of sub-clauses 3.1, the Transferee shall have the rights in the Specified Undertakings and undertake the functions and rights hitherto performed by the relevant Transferor including in regard to be responsible for all functions, contracts, rights, deeds, schemes, agreements, proceedings and other instruments of whatever nature relating to the Specified Undertakings transferred to the Transferee, to which the relevant Transferor is a party, subsisting or having effect on the date of the transfer, and the same shall remain in force and effect against or in favor of the Transferee and may be enforced effectively as if the Transferee had been a party thereto instead of the relevant Transferor.

3.3 The Liabilities of the Specified Undertakings including in relation to the project initiated or pertaining to the period prior to the Effective Date of Transfer, excluding the Specified Liabilities, shall be to the account of the relevant Transferor and the Transferee shall not be in any way be made liable or responsible. In terms of the above, all awards, decrees or orders of any court, tribunal or other authority in relation to the Specified Undertakings in respect of any matter, claim or dispute which arose after the Effective Date of Transfer shall be to the account

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of the Transferee. The Transferee shall be liable to pay or meet only liabilities that are related to the Specified Undertakings for the period after the Effective Date of Transfer including suits, Proceedings and the Transferee shall not be liable or responsible for any liability or matter which relates to the period prior to the Effective Date of Transfer but becomes known after the Effective Date of Transfer.

3.4 As consideration for the transfer and vesting of the Specified Undertakings as specified in this Scheme, Transferee shall pay to the Transferor, an Asset Transfer Value as provided in Schedule A.

3.5 The relevant Transferor shall duly discharge all the outstanding debts on the Assets, properties, interest and lien, secured or unsecured, contingent or otherwise existing, as on the Effective Date of Transfer excluding however the Specified Liabilities and ensure the Assets, properties, interest etc, being transferred and vested in the Transferee are free of all encumberances, lien or charges of any nature whatsoever. The relevant Transferor shall arrange to furnish to the Transferee the necessary approval and No Objection Certificate from the lenders and others having any lien over the Assets, properties and interest free from any such charge encumbrance or lien.

3.6 The entire available capacity, subject to the approval of the Central Government, from BTPS shall be generated and supplied by NTPC to the Bihar Discom, in line with the Amended & Restated / supplementary PPA to be signed, as per the Tariff terms and conditions determined by the Central Electricity Regulatory Commission and the terms and conditions of the Amended and Restated Power Purchase Agreement to be entered into between NTPC and the Bihar Discoms, in line with other standard PPAs signed between NTPC and the Bihar Discoms.

4. *Transfer of Personnel.-*

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4.1 No Specified Personnel shall be transferred to NTPC. NTPC shall assess and decide about keeping certain identified personnel of BSPGCL on deputation basis for initial stabilization period, for a maximum period of 90 days from the Asset Transfer Date, with the understanding that manpower on the rolls of BTPS shall be repatriated back as per the repatriation plan decided by NTPC and GoB / BSPGCL.

All employees related liability for the services already rendered by the Specified Personnel engaged in Barauni Thermal Power Station, shall lie with BSPGCL and no part of any such liabilities shall be borne by NTPC.

5. *Rights and obligations of third parties restricted:-*

Upon the transfer being effected in accordance with the provisions of the Act and this Scheme subject to the limitation on the liability of the Transferee provided in this Scheme or in any Supplemental Agreements that may be entered into between the Transferor and the Transferee, the rights and obligations of all persons to the extent of the transfers effected by this Scheme shall be restricted to the Transferee and such person shall not claim any right or interest against the transferor.

6. The State Government shall notify the Effective Date of Transfer for the Specified Undertaking and Specified Personnel after the completion of the following:

a. Grant of approval by the Bihar Electricity Regulatory Commission under Rule 8 of the Electricity Rules, 2005 to the Bihar DISCOMS for the Power Purchase arrangement at the Tariff terms and conditions to be determined by the Central Electricity Regulatory Commission in regard to BTPS;

b. Execution of the Amended and Restated PPA in regard to Power purchase by Bihar Discoms from Barauni Thermal Power Station;

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c. Permission/Approval/No objection from the lenders and others for transfer of the assets and interest in the Specified Undertaking free of encumberances.

d. Allocation of 100% power from BTPS to State of Bihar by Ministry of Power, Government of India.

e. Assignment of following Coal linkages allocated to BTPS by Ministery of Coal, Government of India:

i) Existing Fuel Supply Agreement (FSA) with ECL for providing Annual Contracted Quantity of 1.1 MTPA coal for BTPS Stage- I including necessary permissions from the Standing Linkage Committee (Long Term), MoP/MoC on takeover of BTPS Stage- I by NTPC.

ii) Assignment of existing Bridge Linkage of 1.07 MTPA for BTPS Stage- II from CCL mines.

f. Application by BSPGCL to MoP/MoC for allocation of coal for BTPS Stage-II under the SHAKTI scheme, 2017 of GoI.

g. Amendment of Memorandum of Agreement signed between NTPC Ltd. and BSPGCL and Article of Association, as may be required, to enable the transfer of shares to NTPC and exit of BSPGCL from KBUNL.

h. Amendment of Joint Venture Agreement between NTPC Ltd. and BSPGCL and Article of Association, as may be required, to enable transfer of shares to NTPC and exit of BSPGCL from NPGCL.

7. The State Government through BSPGCL undertakes to provide land of approximately 300 acres for ash dyke, requisite land for railway siding, ash water pipeline corridor and requisite Right of Way (RoW) / Right of Use (RoU) for make up water line, as required for completion of BTPS Stage-II, within 3 months on a best effort basis from the Effective Date of Transfer.

8. ***Transfer by operation of law*** :- The transfers under this Scheme shall operate and be effective pursuant to action of the State Government by publishing this Scheme and Orders issued in terms of this Scheme and without any further act, deed or thing to be done by the State

Government, Transferor or the Transferee or any other person, subject to the terms and conditions of this Scheme.

9. *Power to remove difficulties :-*

a) The State Government may, by order publish in the *Official Gazette, and* with the consent of the Transferee, amend this Scheme and make such provisions, not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulties arising in implementing the transfers under this Scheme.

b) If any doubt, dispute, difference or issue shall arise in regard to the transfers under these rules, subject to the provisions of the Act, the decision of the State Government thereon, shall be final and binding on all parties.

c) The State Government may, by order published in the official Gazette, make such provisions, not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulties arising in implementing the transfers under these rules.

10. *Exemption of Duty :-*

All charges, duties, levies, taxes, stamp/registration fee etc. contingent to be levied by the Government of Bihar upon transfer of Specified Undertakings to NTPC, stand waived.

By order of the Governor of Bihar

Sd/-

(Pratyaya Amrit)
Principal Secretary.

Memo No-70 / BSPGCL–01 / 2018 /Patna, Dated-

Copy with CD forwarded to the Dy. Secretary, Press (e-gazette Cell), Finance Department, Bihar, Patna to publish in forthcoming extraordinary issue of the Bihar Gazette.

2. He is requested to make available 100 copies of the published gazette to Energy Department, Govt.of Bihar.

Sd/-

Principal Secretary

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Memo No-70 / BSPGCL-01 / 2018 1826 /Patna, Dated- 23/02/2018

Copy to: Principal Secretary to Hon'ble Chief Minister, CM Secretariat, Patna/ Principal Private Secretary to Chief Secretary/ Private Secretary to Hon'ble Energy Minister/ Secretary, Ministry of Power, Govt. of India, New Delhi/ Chairman, Bihar Electricity Regulatory Commission, Patna/ Principal Secretary, Finance Deptt., Bihar, Patna/ Principal Secretary, Revenue and Land Reforms Deptt., Bihar, Patna/ Secretary, Planning and Development Deptt., Bihar, Patna/ All Govt. Deptt./ Head of all Deptt./ Chairman-cum-Managing Director, NTPC, SCOPE Complex, Lodhi Road, New Delhi/Regional Executive Director, East-I, NTPC, Loknayak Jaiprakash Bhawan, Patna/ Accounts Section, Energy Deptt., Patna/ Budget Section, Energy Deptt., Patna/ Joint Secretary, Energy Deptt., Bihar, Patna/ Chairman-cum-Managing Director, Bihar State Power (H) Company Ltd, Patna/ Managing Director, Bihar State Power Generation Company Ltd, Patna/ Managing Director, South Bihar Power Distribution Company Ltd, Patna/ Managing Director, North Bihar Power Distribution Company Ltd, Patna/ Managing Director, Bihar State Power Transmission Company Ltd, Patna/ Managing Director, Bihar State Hydroelectric Power Corporation Ltd/ Director, BREDA, Sone Bhawan, Patna/ District Magistrate-Cum-Collector, Begusarai/Muzaffarpur/Aurangabad/ IT Manager, Energy Deptt., Patna for information and necessary action.

Principal Secretary

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SCHEDULE 'A'

CONSIDERATION PAYABLE FOR TRANSFER OF SPECIFIED UNDERTAKING AND METHOD AND MANNER OF PAYMENT ADJUSTMENTS

Part-I: BTPS SPECIFIED UNDERTAKINGS

1. The Specified Assets are transferred to NTPC as per the consideration given in 'Schedule A Part-II', including inter-alia the assets stated in this schedule enumerated below.

2. Specified assets include all assets, including allocation of water (for Stage-I and Stage-II) from reservoir, rights, powers, authorities, consents, permits and privileges and all specified properties both movable and immovable, including buildings, offices, stores, machinery and equipment, instruments, office furniture, stationery, office equipment and installations pertaining thereto and other rights and interests in or arising out of such specified properties and aforesaid specified assets as were existing immediately before the Effective Date of Transfer in the ownership, possession and control of BSPGCL, whether within the Project area or outside and all records, drawings, registers and other documents as available of whatever nature relating thereto, including but not limited to the feasibility report, drawings, manuals etc.

3. Provision of Land:

   a. The Government of Bihar and BSPGCL would hand over physical possession of the Land, free and clear of all Encumbrances to NTPC.

   b. The land is to be provided by the BSPGCL to NTPC, at a lease rent of Rs 1/- for a period of 33 years from Asset Transfer Date.

   c. The details of land undertakings available for BTPS is as follows:

      i. Area for Stage-I plant : 168.91 Acres

      ii. Area for Stage-II plant : 254.00 Acres

      iii. Area for existing Ash Dyke : 56.00 Acres

iv.	Area for new Ash Dyke	:	293.75 Acres
v.	Area for plant township	:	139.18 Acres
vi.	Total BTPS land area	:	911.84 Acres

4. Assignment of following Coal linkages allocated to BTPS by Ministary of Coal, Government of India, to NTPC:

   a. Fuel Supply Agreement (FSA) with ECL for providing Annual Contracted Quantity of 1.1 MTPA coal for BTPS Stage-I including necessary permissions from the Standing Linkage Committee (Long Term), MoP/MoC on takeover of BTPS Stage- I by NTPC.

   b. Existing Bridge Linkage of 1.07 MTPA for BTPS Stage-II from CCL mines.

5. For supply of water, there is an existing infrastructure for supplying of underground water for the operations of Stage-I. There is also a contingent arrangement for supply of water for operations of Stage-II. These would be transferred to NTPC.

6. All rights, allocations, Approvals including, concurrence of the CEA, coal linkage approvals/sanctions etc. obtained and/or committed for the BTPS, the Land, supply of water, environment and forest etc, as available to BSPGCL or the Government of Bihar are transferred and handed over by BSPGCL or the Government of Bihar to NTPC as of the Effective Transfer Date. BSPGCL or the Government of Bihar, without any liability on and to NTPC, shall duly notified the Authorities in respect of such transfer of Approvals, as required. NTPC shall assist BSPGCL by providing timely information/documents in order to enable such transfers by BSPGCL.

7. All data, records and documents related to the Project, as available with BSPGCL or the Government of Bihar is transferred by BSPGCL or the Government of Bihar to NTPC.

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8. All municipal taxes, duties, cess, levies chargeable on the assets and properties of the BTPS up to the Effective Transfer Date shall be borne by Government of Bihar.

9. BSPGCL or the Government of Bihar, shall extend all possible help for the smooth operation of the Project, including during R&M of Stage-I and for completion of Stage-II, without any hindrance.

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Part-II: TRANSFER CONSIDERATION FOR BTPS UNDERTAKINGS

Assets (both movable and immovable) of BTPS Stage-I and Stage- II alongwith associated land, infrastructure, approval, agreements, concessions and consents (hereinafter both Stage-I and Stage-II of BTPS referred to as "BTPS Assets"), free from all encumberances and charges.

A.	Total Consideration for BTPS Stage-I & II as mutually agreed	Rs 3441.6 Cr
B.	Balance cost to completion to be incurred by NTPC for Stage-II *	Rs 1,023.00 Cr
C.	Additional expenditure on account of IDC for 13 months (i.e. upto June'19)	Rs 185.00 Crs
D.	Contingency amount to be retained by NTPC for completion of Stage-I (any balance remaining with NTPC post completion would be adjusted with outstanding Bihar Discom dues)	Rs 20 Crs
E.	Net consideration to be paid by NTPC for BTPS Stage-I & II	Rs 2,213.60 Cr
I	Apportionment of consideration for BTPS Stage-I (2x110 MW)	Rs 150 Cr
II	Apportionment of consideration for BTPS Stage-II (2x250 MW)	Rs 3,291.6 Cr
III	Total consideration for BTPS	Rs 3,441.6 Cr

Subject to the above, the consideration shall be paid by NTPC in the following manner:

(I) An amount of Rs 22,13,60,00,000/- will be paid by NTPC to Bihar State Power Generation Company Limited within 7 days of Effective Date of Transfer.

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(ii) The consideration shall be payable by NTPC to Bihar State Power Generation Company Limited subject to adjustment as under (details for which are as provided in Schedule B):

(a) Discharge of Specified Liabilities.

(b) Estimated Expenditures to be incurred/accured towards completion of balance work of the Stage-II units to render the Stage-II units capable of sustained Commercial Operation.

For the avoidance of doubt the cost to be incurred/ accrued by NTPC for achieving Comemrcial Operations of Stage-II shall include, but not limited to, direct capital expenditure, Interest During Construction, Incedental expenditure duting construction, precommissioning expenses and financing costs etc.

Any additional expenditure, beyond the estimates, required for completion of facility or compliance to environmental norms/regulatory/statutory order, subject to the approval of CERC, shall form part of capital cost for determination of Tariff.

** NTPC would adjust for any additional expenditure incurred by BSPGCL during the period from 31st May 2018 and the actual Asset Transfer Date, based on actual expenditure. (This amount would be adjusted from Rs.1,023 crores). The net consideration to be paid to BSPGCL would accordingly be revised upwards.*

***In case of any further escalation in the cost, the same would be passed on as per sub-clause (b) above.*

Part-III: TRANSFER CONSIDERATION FOR BSPGCL'S EQUITY IN KBUNL

Bihar State Power Generation Company Limited's equity of **Rs 392,78,48,300/-**, corresponding to **39,27,84,830** number of shares in KBUNL, shall be transferred and vested in NTPC at face value. The consideration shall be paid by NTPC within 7 days from Effective Date of Transfer, subject to adjustment,

if any, of the total the receivables of NTPC towards sale of power to Bihar Discoms.

Number of Shares held by BSPGCL in KBUNL	39,27,84,830
Face Value of Each shares held by BSPGCL in KBUNL	Rs. 10/-
Total Consideration	Rs. 392,78,48,300/-

Part-IV: TRANSFER CONSIDERATION FOR BSPGCL'S EQUITY IN NPGCL

Bihar State Power Generation Company Limited's equity of Rs **17,37,19,00,000/-**, corresponding to **1,73,71,90,000** number of shares in NPGCL, shall be transferred and vested in NTPC at face value.. The consideration shall be paid by NTPC within 7 days from Effective Date of Transfer, subject to adjustment, if any, of the total the receivables of NTPC towards sale of power to Bihar Discoms.

Number of Shares held by BSPGCL in NPGCL	173,71,90,000
Face Value of Each shares held by BSPGCL in NPGCL	Rs. 10/-
Total Consideration	Rs. 17,37,19,00,000/-

Part-V: NET CONSIDERATION FROM NTPC TO BSPGCL / GOVERNMENT OF BIHAR

For the avoidance of doubt, the net consideration from NTPC for BTPS, and towards the equity buy-out of BSPGCL shares in KBUNL and NPGCL, would be calculated as the following.

A.	Net consideration for BTPS	Rs 2,213.60 Cr
B.	Consideration for equity buy-out at face value for KBUNL	Rs 392.8 Cr
C.	Consideration for equity buy-out at face value for NPGCL	Rs 1,737.2 Cr
D.	Total consideration from NTPC to BSPGCL /	Rs 4,343.60 Cr

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	Government of Bihar (A+B+C)	
E.	Debt repayment of BSPGCL towards Stage-II to lenders (including pre-payment charges)*	Rs 4,216.75 Cr
E.	Net consideration from NTPC to BSPGCL / Government of Bihar available for adjustment of NTPC receivable from SBPDCL and NBPDCL**	Rs 126.85 Cr

* As on 31st May 2018

** The above amount may be adjusted against the receivables of KBUNL and NTPC, if any, towards sale of power to Bihar Discoms.

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SCHEDULE 'B'

SPECIFIED LIABILITIES TO BE TRANSFERRED TO TRANSFEREE

Sl. No.	Activity	Estimated Additional cost (Rs. Cr)	Remarks
1.	Amount payable towards Balance works/milestones as per RCE-III (except Envt. Norm compliance)	1,208 (6653-350-5365*+85+185)	RCE-III of BTPS as prepared by BSPGCL is attached.

* As on 31.05.2018

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT

Previously approved Project Cost: Rs. 5308.07 Crs. | Revised Project Cost: Rs. 6653.00 Crs.

(All amount in Rs. Cr.)

Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
1	Supply EPC Price excluding Civil (In INR)	1369.85	1619.85	250.00	BHEL	BHEL			
2	Supply EPC Price (30,000,000 US$) (Foreign Exchange @45.00)	191.83	218.83	27.00		BHEL			
3	Supply EPC Price (28,000,000 Euro) (Foreign Exchange @50.40)	238.72	273.72	35.00		BHEL			
4	Services for Commissioning	250.44	300.44	50.00	BHEL	BHEL			
5	Inland Transportation	44.00	55.00	11.00		BHEL			
6	Taxes & Duties excluding Entry Tax	224.85	246.52	21.67		BHEL			
7	Entry Tax	127.52	200.00	72.48	BHEL	BHEL			
8	Civil Works	994.30	994.30	0.00		BHEL			
9	Spares (a) B.T.G + T.C (b) BoP	95.29	53.00	-42.29		BHEL			
10	Additional W. O. No. 1 & 2 dt 29.09.2013 for Switchyard bays, SAC capacity increase, DG Set, Hoist and Facility for full rack FO unloading	43.62	43.62	0.00	BHEL	BHEL			
11	Civil Engineering Charges	15.00	15.00	0.00		BHEL			
A	EPC Price within Plant Boundary	3595.42	4020.28	424.86			87.75%	3527.80	492.48

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT

Previously approved Project Cost: Rs. 5308.07 Crs.		Revised Project Cost: Rs. 6653.00 Crs.							
		(All amount in Rs. Cr.)							
Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
	Proposed Ash dyke								
1	Ash dyke Land Cost	87.00	38.75	-48.25	BSPGCL		100.00%	38.75	0.00
2	R&R Costs	10.00	2.00	-8.00	BSPGCL		50.00%	1.00	1.00
3	Ash dyke construction	175.00	175.00	0.00	BSPGCL		0.00%	0.00	175.00
4	Construction of Security Outpost in Ash Dyke Area	3.00	0.00	-3.00	BSPGCL		50.00%	0.00	0.00
5	Land Cost for Ash Pipe Corridor	1.50	0.00	-1.50	BSPGCL		100.00%	0.00	0.00
6	Contingent arrangement for Ash Disposal System	0.00	2.00	2.00	BSPGCL		100.00%	2.00	0.00
	Plant								0.00
7	Locomotive	10.00	2.00	-8.00	BSPGCL		0.00%	0.00	2.00
8	Bulldozers, cranes and payloaders	12.00	6.00	-6.00	BSPGCL		100.00%	6.00	0.00
9	Protection Bund Land Cost	1.00	1.00	0.00	BSPGCL		0.00%	0.00	1.00
10	Protection Bund Construction	20.00	10.00	-10.00	BSPGCL	WRD (Bihar)	64.60%	6.46	3.54
11	Walkie talkie, mobiles, fire tenders	2.00	2.00	0.00	BSPGCL		0.00%	0.00	10
12	Furniture and interior works in Service Building & Administrative Building								
13	Computers, LAN								
	Railway Infrastrcture								

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT									
Previously approved Project Cost: Rs. 5308.07 Crs.			Revised Project Cost: Rs. 6653.00 Crs.						
		(All amount in Rs. Cr.)							
Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
14	Rail infrastructure	104.32	149.79	45.47	BSPGCL	RITES & Railway	85.00%	60.00	89.79
	Colony Renovation for 840 tenants								
15	Construction of Sewerage treatment plant and pumping station including excavation of rain water catchment pond and civil works for pumping	3.50	1.00	-2.50	BSPGCL		0.00%	0.00	1.00
16	Renovation of School Building	1.00	0.00	-1.00	BSPGCL		100.00%	0.00	0.00
17	Renovation of existing quarters/ Construction of new quarters	50.00	20.00	-30.00	BSPGCL		80.00%	16.00	4.00
18	Construction of watch towers	1.00	1.00	0.00	BSPGCL		0.00%	0.00	1.00
19	Renovation of non residential buildings	5.00	0.00	-5.00	BSPGCL		100.00%	0.00	0.00
20	Replacement of drinking water lines, treatment plant and tanks	1.00	1.00	0.00	BSPGCL		0.00%	0.00	1.00
21	Construction of Shopping Complex with shops, banks, post office and other infrastructure, School, Club and other facilities etc.	1.00	1.00	0.00	BSPGCL		0.00%	0.00	1.00
22	Construction of roads-8 km, drains-RCC- 15 km	10.00	0.00	-10.00	BSPGCL		100.00%	0.00	0.00

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REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT

Previously approved Project Cost: Rs. 5308.07 Crs. | Revised Project Cost: Rs. 6653.00 Crs.

(All amount in Rs. Cr.)

Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
23	Ambient air monitoring stations around plant water quality anylizer etc	1.00	5.00	4.00	BSPGCL		100.00%	5.00	0.00
24	Hospital renovation and construction of casuality ward	1.00	0.00	-1.00	BSPGCL		100.00%	0.00	0.00
25	Construction of Community hall, clubs, swimming pool and equipments	0.50	0.00	-0.50	BSPGCL		100.00%	0.00	0.00
26	Construction of Guest house, field hostels	2.00	0.00	-2.00	BSPGCL		100.00%	0.00	0.00
27	Lighting masts and illumination	2.50	2.50	0.00	BSPGCL		100.00%	2.50	0.00
28	Rewiring of existing quarters	0.00	0.00	0.00	BSPGCL		100.00%	0.00	0.00
29	Rewiring of existing non-residential building including hospital and schools	1.00	0.00	-1.00	BSPGCL		100.00%	0.00	0.00
30	Wiring and lighting and other electrical system of community hall, clubs, swimming pool, guest house, field hostel, canteen, bank, post office, shopping complex, other equipment	0.00	0.00	0.00	BSPGCL		100.00%	0.00	0.00
31	Other unforseen work	5.00	5.00	0.00	BSPGCL		0.00%	0.00	5.00
	Exisitng Unit Ash Infrastructurre								0.00
32	Approach Road to project site from NH including culvert on IOCL Pipeline	5.00	5.00	0.00	BSPGCL		0.00%	0.00	5.00

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT									
Previously approved Project Cost: Rs. 5308.07 Crs.			Revised Project Cost: Rs. 6653.00 Crs.						
		(All amount in Rs. Cr.)							
Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
33	Storm Drainage outside plant/Rain Water Harvesting/Land escaping of green belt area	23.81	23.81	0.00	BSPGCL		0.00%	0.00	23.81
	Water Infrastructure								0.00
34	Water Infrastructure	0.00	0.00	0.00	BSPGCL		0.00%	0.00	0.00
	Electrical Package								0.00
35	Erection of Transmission line (220 kV) after Gantry of Switch yard of 2X250 MW unit to existing 220 kV transmission line (6 bays)	0.00	0.00	0.00	BSPGCL		100.00%	0.00	0.00
36	Erection of interconnection transmission (132 kV) line between existing switch yard of 2X110 MW units and extension project switchyard (2X250 MW units), Rehabilitation of 2 bays of 132 kV old switchyard and shifting of 132 kV transmission line from old Ash Dyke Area	10.00	10.00	0.00	BSPGCL	BSPTCL	50.00%	5.00	5.00
37	Load Flow Study	0.00	0.00	0.00	BSPGCL		0.00%	0.00	0.00
38	Consultancy Charges - EIA, general, PWC, Railway etc	13.00	20.00	7.00	BSPGCL		95.00%	19.00	1.00
B	**Enabling Works Total**	563.13	483.85	-79.28					

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT

Previously approved Project Cost: Rs. 5308.07 Crs. | Revised Project Cost: Rs. 6653.00 Crs.

(All amount in Rs. Cr.)

Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work.
C	IDC (Upto Dec' 2017)	850.00	1475.00	625.00	BSPGCL		100.00%	1475.00	0.00
D	Corporate Social Responsibility	22.00	22.00	0.00	BSPGCL		0.00%	0.00	22.00
E	Pre-commissioning Expenses for trail Run, Commissioning etc (LDO/HFO/Coal/DM Water)	107.52	91.02	-16.50	BSPGCL		77.54%	70.58	20.44
	Operation & maintenance of unit# 8 & 9 for 2 months after COD	0.00	90.63	90.63	BSPGCL		50.00%	45.32	45.32
F	Pre-commissioning Epenses for Establishment (May-13 to Dec-17)	45.00	65.00	20.00	BSPGCL		65.20%	42.38	22.62
G	Security Expenditure for CISF	0.00	35.00	35.00	BSPGCL		100.00%	35.00	0.00
H	Contingency & Administrative Expenses	25.00	20.00	-5.00	BSPGCL		75.00%	15.00	5.00
I	Coal Block Development and its statutory fees etc.	100.00	0.00	-100.00	BSPGCL		0.00%	0.00	0.00
J	FGD (De-Sox), SCR (De-Nox), SPM & other associated equipments, online reporting systems and consultancy services required to meet new environment norms etc.	0.00	350.00	350.00	BSPGCL		0.00%	0.00	350.00
	Total	5308.07	6652.78	1344.71				5372.78	1288.00

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT								
Previously approved Project Cost: Rs. 5308.07 Crs.			Revised Project Cost: Rs. 6653.00 Crs.					
		(All amount in Rs. Cr.)						
Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Name of Contractor	Agency	Physical Work Completed (%)	Cummulative Expenditure as on 30.11.17	Cost of balance work
	Ganga River Water Scheme		85	85	BSPGCL		0.00%	0.00	85.00
	IDC upto June'2019 (for NTPC)								185.00
	Total Cost of Balance Works (Excl FGD)								1208.00

REVISED ESTIMATE PROJECT COST OF 2X250 MW BTPS EXTENSION PROJECT

Previously approved Project Cost: Rs. 5308.07 Crs. | Revised Project Cost: Rs. 6653.00 Crs.

(All amount in Rs. Cr.)

Sl. No.	Description	Provision in approved cost	Total Cost	Difference	Remarks
1	Supply EPC Price excluding Civil (In INR)	1369.85	1619.85	250.00	
2	Supply EPC Price (30,000,000 US$) (Foreign Exchange @45.00)	191.83	218.83	27.00	
3	Supply EPC Price (28,000,000 Euro) (Foreign Exchange @50.40)	238.72	273.72	35.00	
4	Services for Commissioning	250.44	300.44	50.00	
5	Inland Transportation	44.00	55.00	11.00	
6	Taxes & Duties excluding Entry Tax	224.85	246.52	21.67	
7	Entry Tax	127.52	200.00	72.48	
8	Civil Works	994.30	994.30	0.00	
9	Spares (a) B.T.G + T.C (b) BoP	95.29	53.00	-42.29	
10	Additional W. O. No. 1 & 2 dt 29.09.2013 for Switchyard bays, SAC capacity increase, DG Set, Hoist and Facilitiy for full rack FO unloading	43.62	43.62	0.00	
11	Civil Engineering Charges	15.00	15.00	0.00	
A	EPC Price within Plant Boundary	3595.42	4020.28	424.86	
	Proposed Ash dyke				
1	Ash dyke Land Cost	87.00	38.75	-48.25	
2	R&R Costs	10.00	2.00	-8.00	
3	Ash dyke construction	175.00	175.00	0.00	
4	Construction of Security Outpost in Ash Dyke Area	3.00	0.00	-3.00	
5	Land Cost for Ash Pipe Corridor	1.50	0.00	-1.50	
6	Contingent arrangement for Ash Disposal System	0.00	2.00	2.00	
	Plant				
7	Locomotive	10.00	2.00	-8.00	
8	Bulldozers, cranes and payloaders	12.00	6.00	-6.00	
9	Protection Bund Land Cost	1.00	1.00	0.00	
10	Protection Bund Construction	20.00	10.00	-10.00	
11	Walkie talkie, mobiles, fire tenders	2.00	2.00	0.00	
12	Furniture and interior works in Service Building & Administrative Building				
13	Computers, LAN				
	Railway Infrastrcture				
14	Rail infrastructure	104.32	149.79	45.47	
	Colony Renovation for 840 tenants				
15	Construction of Sewerage treatment plant and pumping station including excavation of rain water catchment pond and civil works for pumping	3.50	1.00	-2.50	

16	Renovation of School Building	1.00	0.00	-1.00	
17	Renovation of existing quarters/ Construction of new quarters	50.00	20.00	-30.00	
18	Construction of watch towers	1.00	1.00	0.00	
19	Renovation of non residential buildings	5.00	0.00	-5.00	
20	Replacement of drinking water lines,treatment plant and tanks	1.00	1.00	0.00	
21	Construction of Shopping Complex with shops, banks, post office and other infrastructure, School, Club and other facilities etc.	1.00	1.00	0.00	
22	Construction of roads-8 km, drains-RCC- 15 km	10.00	0.00	-10.00	
23	Ambient air monitoring stations around plant water quality anyliizer etc	1.00	5.00	4.00	
24	Hospital renovation and construction of casuality ward	1.00	0.00	-1.00	
25	Construction of Community hall, clubs, swimming pool and equipments	0.50	0.00	-0.50	
26	Construction of Guest house, field hostels	2.00	0.00	-2.00	
27	Lighting masts and illumination	2.50	2.50	0.00	
28	Rewiring of existing quarters	0.00	0.00	0.00	
29	Rewiring of existing non-residential building including hospital and schools	1.00	0.00	-1.00	
30	Wiring and lighting and other electrical system of community hall, clubs, swimming pool, guest house, field hostel, canteen, bank, post office, shopping complex, other equipment	0.00	0.00	0.00	
31	Other unforseen work	5.00	5.00	0.00	
	Exisiting Unit Ash Infrastructurre				
32	Approach Road to project site from NH including culvert on IOCL Pipeline	5.00	5.00	0.00	
33	Storm Drainage outside plant/Rain Water Harvesting/Land escaping of green belt area	23.81	23.81	0.00	
	Water Infrastructure				
34	Water Infrastructure	0.00	0.00	0.00	
	Electrical Package				
35	Erection of Transmission line (220 kV) after Gantry of Switch yard of 2X250 MW unit to existing 220 kV transmission line (6 bays)	0.00	0.00	0.00	
36	Erection of interconnection transmission (132 kV) line between existing switch yard of 2X110 MW units and extension project switchyard (2X250 MW units), Rehabilitation of 2 bays of 132 kV old switchyard and shifting of 132 kV transmission line from old Ash Dyke Area	10.00	10.00	0.00	

37	Load Flow Study	0.00	0.00	0.00	
38	Consultancy Charges - EIA, general, PMC, Railway etc	13.00	20.00	7.00	
B	**Enabling Works Total**	563.13	483.85	-79.28	
C	IDC (Upto Dec' 2017)	850.00	1475.00	625.00	
D	Corporate Social Responsibility	22.00	22.00	0.00	
E	Pre-commissioning Expenses for trail Run, Commissioning etc (LDO/HFO/Coal/DM Water)	107.52	91.02	-16.50	
	Operation & maintenance of unit# 8 & 9 for 2 months after COD	0.00	90.63	90.63	
F	Pre-commissioning Epenses for Establishment (May-13 to Dec-17)	45.00	65.00	20.00	
G	Security Expenditure for CISF	0.00	35.00	35.00	
H	Contingency & Administrative Expenses	25.00	20.00	-5.00	
I	Coal Block Development and its statutory fees etc.	100.00	0.00	-100.00	
J	FGD (De-Sox), SCR (De-Nox), SPM & other associated equipments, online reporting systems and consultancy services required to meet new environment norms etc.	0.00	350.00	350.00	At the rate 0.70 Crs./MW
	Total	5308.07	6652.78	1344.71	

Revised Project cost : Rs. 6652.78 Crores Say Rs. 6653.00 Cr.

(C. K. Pathak)
M/s STEAG

16/09/17
(Amita Nand)
ESE (P&D), BSPGCL

(D. K. Jha)
ESE, BSPGCL

(K. N. Jha)
ESE (Project), BTPS

(Pradeep Kumar)
G.M. (F&A), BSPGCL

(J. N. Yadav)
C.E. (Civil), BSPGCL

16.9.17
(A. K. Jha)
C.E. (Generation), BSPGCL

(A. K. Sinha)
G.M. cum C.E., BTPS

16/9
(Rajan Prasad)
C.E. (P&D), BSPGCL

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GOVERNMENT OF BIHAR
ENERGY DEPARTMENT

NOTIFICATION

No. ..... Dated ...../...../2018

THE BIHAR POWER GENERATION UNDERTAKINGS TRANSFER SCHEME, 2018 (AMENDMENT)

In exercise of powers conferred under Sections 131, 134 and other applicable provisions of the Electricity Act, 2003, the Government of Bihar have notified 'The Bihar Power Generation Undertakings Transfer Scheme 2018' ("Transfer Scheme") vide notification No. 5 dated 27.06.2018 (Bihar Gazette No. Patna 641 dated 06.07.2018) for the purpose of transfer and vesting of properties, interests, rights, specified assets, specified liabilities and specified personnel concerning (a) Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar; (b) BSPGCL's equity contribution in Nabinagar Power Generating Company Private Limited (NPGCL) and (c) BSPGCL's equity contribution in Kanti Bijli Utpadan Nigam Limited (KBUNL), from BSPGCL to NTPC Limited.

On the matter of coal allocation for Barauni Stage-II (2x250 MW), the Transfer Scheme envisaged that BSPGCL would surrender the Badam coal block to the Ministry of Coal (MoC), Govt. of India and apply to Ministry of Power (MoP)/Ministry of Coal (MoC) for allocation of coal under SHAKTI Scheme, 2017 of Govt. of India.

Whereas Ministry of Coal, Govt. of India, vide letter reference number 23014/4/2018-CLD dated September 05, 2018 has forwarded the minutes of the meeting of SLC (LT) for Power Sector held on August 09, 2018 wherein the MoC has approved to transfer the Bridge Linkage for Barauni TPS Stage-II to NTPC in the event of NTPC taking over the Badam coal block.

In consideration of above, the specific provisions of Transfer Scheme pertaining to Badam Coal Block, is hereby amended with immediate effect as provided in Annexure-A herein.

Further, in partial modification of the notification No./BSPGCL-01/2018/08 dated 07.08.2018 notifying Effective Date of Transfer for the Bihar Power Generation Undertaking Transfer Scheme, 2018 (Bihar Gazette No. Patna 761 dated 09.08.2018) the State Government hereby appoints 15.12.2018 as the Effective Date of Transfer for

Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar as the date of coming into force of 'The Bihar Power Generation Undertakings Transfer Scheme 2018' ("Transfer Scheme") and as the Date of Transfer of mentioned specified properties, interests, rights, assets, liabilities and personnel, from BSPGCL to NTPC Limited.

This notification shall come into force with immediate effect.

By order of the Governor of Bihar

Sd/-

(Pratyaya Amrit)
Principal Secretary.

Memo No-50 / BSPGCL–01 / 2018(खंड–I) /Patna, Dated-

Copy with CD forwarded to the Dy. Secretary, Press (e-gazette Cell), Finance Department, Bihar, Patna to publish in forthcoming extraordinary issue of the Bihar Gazette.

2. He is requested to make available 100 copies of the published gazette to Energy Department, Govt.of Bihar.

Sd/-

Principal Secretary

Memo No-50 / BSPGCL–01 / 2018(खंड–I) 312 /Patna, Dated- 14/12/2018

Copy to: Principal Secretary to Hon'ble Chief Minister, CM Secretariat, Patna/ Principal Private Secretary to Chief Secretary/ Private Secretary to Hon'ble Energy Minister/ Secretary, Ministry of Power, Govt. of India, New Delhi/ Chairman, Bihar Electricity Regulatory Commission, Patna/ Principal Secretary, Finance Deptt., Bihar, Patna/ Principal Secretary, Revenue and Land Reforms Deptt., Bihar, Patna/ Secretary, Planning and Development Deptt., Bihar, Patna/ All Govt. Deptt./ Head of all Deptt./ Chairman-cum-Managing Director, NTPC, SCOPE Complex, Lodhi Road, New Delhi/Regional Executive Director, East-I, NTPC, Loknayak Jaiprakash Bhawan, Patna/ Accounts Section, Energy Deptt., Patna/ Budget Section, Energy Deptt., Patna/ Joint Secretary, Energy Deptt., Bihar, Patna/ Chairman-cum-Managing Director, Bihar State Power (H) Company Ltd, Patna/ Managing Director, Bihar State Power Generation Company Ltd, Patna/ Managing Director, South Bihar Power Distribution Company Ltd, Patna/ Managing Director, North Bihar Power Distribution Company Ltd, Patna/ Managing Director, Bihar State Power Transmission Company Ltd, Patna/ Managing Director, Bihar State Hydroelectric Power Corporation Ltd/ Director, BREDA, Sone Bhawan, Patna/ District Magistrate-Cum-Collector, Begusarai/Muzaffarpur/Aurangabad/ IT Manager, Energy Deptt., Patna for information and necessary action.

Principal Secretary

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Annexure-A

Sl. No.	Para No. of Transfer Scheme	Provision as per notification dtd 27.06.2018	Amended Provision
1.	WHEREAS CLAUSE (VIII)(d)	Further on the matter of Badam coal block, which has been allotted to BSPGCL, it has been agreed between NTPC and BSPGCL that in view of the difficulties being faced by BSPGCL in development of the coal block, BSPGCL would surrender the coal block to the Ministry of Coal (MoC), Govt. of India. Consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.	Whereas the Ministry of Coal, Govt. of India vide its letter no. 23014/4/2018-CLD dt. 5th Sept. 2018, has decided to transfer the bridge linkage of BTPS Stage-II (2x250 MW) to NTPC in the event of NTPC taking over the Badam Coal Block. Therefore, it has been agreed between NTPC and BSPGCL that the Badam Coal Block, allocated to BTPS Stage-II, shall be assigned to NTPC in terms of the allotment agreement dated 30.03.2015 between BSPGCL and Ministry of Coal, GoI for the Badam Coal Block. All liabilities except assests related liabilities pertaining to Badam Coal Block accruing for the period prior to the Date of Transfer of Coal Block to NTPC shall be to the account of BSPGCL.
	WHEREAS CLAUSE (IX)(b)	For Badam coal block, post the surrender by BSPGCL,	deleted

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		consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.	
	SCHEDULE 'A' Part-I: BTPS SPECIFIED UNDERTAKINGS	No provision	New Para 10 is inserted after the existing para 9 as under: **"10. Badam Coal Block** The Badam Coal Block allocated to BSPGCL for end use of the Barauni Thermal Power Station Stage-II shall be assigned to NTPC in terms of the allotment agreement dated 30.03.2015 between BSPGCL and MoC, GoI for the Badam Coal Block.

बिहार सरकार
ऊर्जा विभाग

अधिसूचना

संख्या–पी० / BSPGCL–01 / 2018(खंड–I) दिनांक ..... / ..... / 2018

बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 (संशोधन)

विद्युत् अधिनियम, 2003 की धारा 131, 134 एवं अन्य लागू उपबंधों के तहत प्रदत्त शक्तियों का प्रयोग करते हुए, राज्य सरकार द्वारा अधिसूचना सं० 05 दिनांक 27.06.2018 (बिहार गज़ट सं० पटना 641 दिनांक 06.07.2018) के माध्यम से BSPGCL के (क) बेगुसराय में स्थित बरौनी थर्मल पावर स्टेशन (BTPS) स्टेज-1 तथा स्टेज-2; (ख) नबीनगर पावर जेनरेटिंग कंपनी प्राइवेट लिमिटेड (NPGCL) में हिस्सापूँजी योगदान और (ग) कांटी बिजली उत्पादन निगम लिमिटेड (KBUNL) में हिस्सापूँजी योगदान के तहत् BSPGCL में निहित परिसंपत्तियों, हितों, अधिकारों, निर्दिष्ट संपत्तियों , निर्दिष्ट देयताएं और निर्दिष्ट कर्मियों को NTPC लिमिटेड को हस्तांतरण के उद्देश्य हेतु 'बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018' ("अंतरण योजना") अधिसूचित की गयी है।

उपर्युक्त अंतरण योजना में बरौनी स्टेज-II (2x250 मेगावाट) हेतु कोयला आवंटन के संदर्भ में यह उल्लिखित है कि BSPGCL बादम कोल ब्लॉक कोयला मंत्रालय, भारत सरकार को वापस कर देगा तथा भारत सरकार की SHAKTI योजना, 2017 के तहत कोयला मंत्रालय, भारत सरकार के समक्ष कोयला आवंटन हेतु आवेदन करेगा।

चूंकि कोयला मंत्रालय, भारत सरकार ने प्रासंगित पत्र सं० 23014/4/2018-CLD दिनांक 05.09.2018 के माध्यम से उर्जा क्षेत्र के लिए SLC(LT) की बैठक की कार्यवाही अग्रसारित किया है जिसमें कोयला मंत्रालय ने बादम कोल ब्लॉक का NTPC द्वारा अधिग्रहण की स्थिति में बरौनी थर्मल पावर स्टेशन स्टेज-II के लिए ब्रिज लिंकेज को NTPC को हस्तांतरित करने को अनुमोदित किया है।

उपर्युक्त पर विचार करते हुए अंतरण योजना में बादम कोल ब्लॉक से सम्बंधित विशिष्ट उपबंधों को तत्क्षण प्रभाव से, जैसा कि इसके अनुसूची-क में उपबंधित है, एतद् द्वारा संशोधित किया जाता है।

तत्पश्चात, अधिसूचना सं० प्र०/BSPGCL/01/2018/08 दिनांक 07.08.2018 के माध्यम से अधिसूचित बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 के अंतरण की प्रभावी तिथि (बिहार गज़ट सं० पटना 761 दिनांक 09.08.2018) का आंशिक संशोधन करते हुए राज्य सरकार एतद द्वारा दिनांक 15.12.2018 को बेगुसराय स्थित बरौनी थर्मल पावर स्टेशन (BTPS) स्टेज-I तथा स्टेज-II के बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 के अंतर्गत अंतरण की प्रभावी तिथि तथा निहित परिसंपत्तियों, हितों, अधिकारों, निर्दिष्ट संपत्तियों , निर्दिष्ट देयताएं और निर्दिष्ट कर्मियों को BSPGCL से NTPC लिमिटेड को हस्तांतरण की तिथि के रूप में घोषित किया जाता है।

नोट:- अंतरण योजना के हिंदी संस्करण के किसी बिंदु या विवरणी पर अस्पष्टता अथवा संशय की स्थिति में अंग्रेजी संस्करण मान्य होगा ।

यह अधिसूचना तुरंत के प्रभाव से प्रवृत होगी।

बिहार- राज्यपाल के आदेश से,

ह0/-

(प्रत्यय अमृत)

सरकार के प्रधान सचिव।

ज्ञापांक–प्र0/BSPGCL–01/2018(खंड–I) /पटना, दिनांक–

प्रतिलिपि:–उप सचिव, प्रेस (ई–गजट कौशांग), वित्त विभाग, बिहार, पटना को बिहार राजपत्र के अगामी असाधारण अंक में मुद्रण हेतु (सी0डी0 एवं दो हार्ड कॉपी के साथ) प्रेषित।

2 उनसे अनुरोध है कि प्रकाशित गजट की 100 (एक सौ) प्रतियाँ ऊर्जा विभाग, बिहार सरकार को उपलब्ध कराने की कृपा की जाय।

ह0/-

सरकार के प्रधान सचिव।

ज्ञापांक–प्र0/BSPGCL–01/2018(खंड–I) 3121 /पटना, दिनांक– 14/12/2018

प्रतिलिपि:–मा0 मुख्यमंत्री के प्रधान सचिव, मुख्यमंत्री सचिवालय, पटना/मुख्य सचिव के प्रधान आप्त सचिव/मा0 मंत्री ऊर्जा के आप्त सचिव/सचिव, विद्युत मंत्रालय, भारत सरकार, नई दिल्ली/अध्यक्ष, बिहार विद्युत विनियामक आयोग, पटना/प्रधान सचिव, वित्त विभाग, बिहार, पटना/प्रधान सचिव, राजस्व एवं भूमि सुधार विभाग, बिहार, पटना/सचिव, योजना एवं विकास विभाग, बिहार, पटना/सरकार के सभी विभाग/सभी विभागाध्यक्ष/अध्यक्ष–सह–प्रबन्ध निदेशक, एन0टी0पी0सी0, स्कोप कम्पलेक्स, लोधी रोड, नई दिल्ली/क्षेत्रीय कार्यकारी निदेशक, पूरब–I एन0टी0पी0सी0–लोकनायक जयप्रकाश भवन, पटना/लेखा शाखा, ऊर्जा विभाग, पटना/बजट शाखा, ऊर्जा विभाग, पटना/संयुक्त सचिव, ऊर्जा विभाग, बिहार, पटना/अध्यक्ष–सह–प्रबन्ध निदेशक, बिहार स्टेट पावर (होo) कं0 लि0, पटना/प्रबन्ध निदेशक, बिहार स्टेट पावर जेनरेशन कं0 लि0, पटना/प्रबन्ध निदेशक, साउथ/नॉर्थ बिहार पावर डिस्ट्रीब्यूशन कं0 लि0 पटना/ प्रबन्ध निदेशक, बिहार स्टेट पावर ट्रान्समिशन कं0 लि0, पटना/प्रबन्ध निदेशक, बिहार राज्य जिला विद्युत निगम/निदेशक, ब्रेडा, सोन भवन/सगाहर्त्ता, बेगुसराय/मुजफ्फरपुर/औरंगाबाद एवं आई0टी0 मैनेजर, ऊर्जा विभाग, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

सरकार के प्रधान सचिव।

क्रम सं०	अंतरण योजना का अनुच्छेद सं०	अधिसूचना दिनांक 27.06.2018 के अनुसार प्रावधान	संशोधित प्रावधान
1.	जबकि खंड (VIII)(घ)	यह भी कि BSPGCL को आवंटित बादम कोल ब्लॉक के सम्बन्ध में NTPC एवं BSPGCL के बीच यह भी सहमति बनी है कि उक्त कोयला ब्लॉक को विकसित करने में आ रही कठिनाईयों को देखते हुए BSPGCL द्वारा इसे भारत सरकार के कोयला मंत्रालय को वापस सौंप दिया जाएगा। इसके परिणाम स्वरुप यदि कोई जुर्माना, वसूली या समर्पण शुल्क भारित किया जाता है, तो उसे NTPC द्वारा BTPS के स्वामित्व हस्तांतरण के एवज में भुगतेय अंतरण निधि में जोड़ा जाएगा तथा उस रकम को BTPS के विद्युत टैरिफ में केन्द्रीय विद्युत विनियामक आयोग से स्वीकृति प्राप्त कर समायोजित किया जाएगा । यदि केन्द्रीय विद्युत विनियामक आयोग द्वारा उक्त समायोजन की स्वीकृति नहीं दी जाती है तो वैसी परिस्थिति में BTPS के स्वामित्व ग्राहण के पश्चात NTPC उक्त राशि को परस्पर मानी शर्तों पर PPA अनुपातिक आधार पर वितरण कम्पनीयों से प्राप्त कर सकता है।	जबकि कोयला मंत्रालय, भारत सरकार ने पत्र संख्या 23014/4/2018-CLD दिनांक 5 सितंबर 2018 के माध्यम से बीटीपीएस स्टेज-II (2x250 मेगावाट) हेतु NTPC को ब्रिज लिंकेज स्थानांतरित करने की स्वीकृति इस शर्त के साथ दी है कि NTPC बादम कोल ब्लॉक को develop करेगा। इसलिए BSPGCL तथा NTPC के बीच यह सहमति बनी है कि बीटीपीएस स्टेज-II हेतु BSPGCL को आवंटित बादम कोल ब्लॉक BSPGCL एवं कोयला मंत्रालय, भारत सरकार के बीच बादम कोल ब्लॉक हेतु दिनांक 30.03.2015 को संपन्न आवंटन समझौते के शर्तों पर NTPC को सौंपा जाएगा। कोल ब्लॉक के NTPC को हस्तांतरण की तारीख के पूर्व की अवधि की बादम कोल ब्लॉक की आस्तियों संबंधी देनदारियों को छोड़कर उक्त कोल ब्लॉक से संबंधित सभी देनदारियां BSPGCL की होंगी।
2.	जबकि खंड (IX)(ख)	बादम कोल ब्लॉक के लिए, BSPGCL द्वारा कोल ब्लॉक को वापस सौपने के पश्चात, भारित जुर्माना, वसुली या समर्पण शुल्क (यदि कोई होता है), को BTPS के स्वामित्व हस्तांतरण के एवज में भुगतेय अंतरण निधि में जोड़ा जाएगा	विलोपित

		तथा उस रकम को BTPS के विद्युत टैरिफ में केन्द्रीय विद्युत विनियामक आयोग से स्वीकृति प्राप्त कर समायोजित किया जाएगा । यदि केन्द्रीय विद्युत विनियामक आयोग द्वारा उक्त समायोजन की स्वीकृति नहीं दी जाती है तो वैसी परिस्थिति में BTPS के स्वामित्व ग्रहण के पश्चात NTPC उक्त राशि को परस्पर मानी शर्तों पर PPA अनुपातिक आधार पर वितरण कम्पनीयों से प्राप्त कर सकता है ।	
3.	अनुसूची 'क' भाग- I: निर्दिष्ट उपक्रम बीटीपीएस	कोई प्रावधान नहीं	मौजूदा अनुच्छेद 9 के बाद नया अनुच्छेद 10 डाला गया है: **"10. बादम कोल ब्लॉक** बरौनी थर्मल पावर स्टेशन स्टेज-II के अंतिम उपयोग हेतु BSPGCL को आवंटित बादम कोल ब्लॉक BSPGCL एवं कोयला मंत्रालय, भारत सरकार के बीच बादम कोल ब्लॉक हेतु दिनांक 30.03.2015 को संपन्न आवंटन समझौते के शर्तों पर NTPC को सौंपा जाएगा।

GOVERNMENT OF BIHAR
ENERGY DEPARTMENT

NOTIFICATION

No. ..... Dated ../../2018

THE BIHAR POWER GENERATION UNDERTAKINGS TRANSFER SCHEME, 2018 (AMENDMENT)

In exercise of powers conferred under Sections 131, 134 and other applicable provisions of the Electricity Act, 2003, the Government of Bihar have notified 'The Bihar Power Generation Undertakings Transfer Scheme 2018' ("Transfer Scheme") vide notification No. 5 dated 27.06.2018 (Bihar Gazette No. Patna 641 dated 06.07.2018) for the purpose of transfer and vesting of properties, interests, rights, specified assets, specified liabilities and specified personnel concerning (a) Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar; (b) BSPGCL's equity contribution in Nabinagar Power Generating Company Private Limited (NPGCL) and (c) BSPGCL's equity contribution in Kanti Bijli Utpadan Nigam Limited (KBUNL), from BSPGCL to NTPC Limited.

On the matter of coal allocation for Barauni Stage-II (2x250 MW), the Transfer Scheme envisaged that BSPGCL would surrender the Badam coal block to the Ministry of Coal (MoC), Govt. of India and apply to Ministry of Power (MoP)/Ministry of Coal (MoC) for allocation of coal under SHAKTI Scheme, 2017 of Govt. of India.

Whereas Ministry of Coal, Govt. of India, vide letter reference number 23014/4/2018-CLD dated September 05, 2018 has forwarded the minutes of the meeting of SLC (LT) for Power Sector held on August 09, 2018 wherein the MoC has approved to transfer the Bridge Linkage for Barauni TPS Stage-II to NTPC in the event of NTPC taking over the Badam coal block.

In consideration of above, the specific provisions of Transfer Scheme pertaining to Badam Coal Block, is hereby amended with immediate effect as provided in Annexure-A herein.

Further, in partial modification of the notification No./BSPGCL-01/2018/08 dated 07.08.2018 notifying Effective Date of Transfer for the Bihar Power Generation Undertaking Transfer Scheme, 2018 (Bihar Gazette No. Patna 761 dated 09.08.2018) the State Government hereby appoints 15.12.2018 as the Effective Date of Transfer for

Barauni Thermal Power Station (BTPS) Stage-I and Stage-II situated at Begusarai, Bihar as the date of coming into force of 'The Bihar Power Generation Undertakings Transfer Scheme 2018' ("Transfer Scheme") and as the Date of Transfer of mentioned specified properties, interests, rights, assets, liabilities and personnel, from BSPGCL to NTPC Limited.

This notification shall come into force with immediate effect.

By order of the Governor of Bihar

Sd/-

(Pratyaya Amrit)
Principal Secretary.

Memo No-90 / BSPGCL–01 / 2018(खंड–I) /Patna, Dated-

Copy with CD forwarded to the Dy. Secretary, Press (e-gazette Cell), Finance Department, Bihar, Patna to publish in forthcoming extraordinary issue of the Bihar Gazette.

2. He is requested to make available 100 copies of the published gazette to Energy Department, Govt.of Bihar.

Sd/-

Principal Sectetary

Memo No-90 / BSPGCL–01 / 2018(खंड–I) 3121 /Patna, Dated- 14/12/2018

Copy to: Principal Secretary to Hon'ble Chief Minister, CM Secretariat, Patna/ Principal Private Secretary to Chief Secretary/ Private Secretary to Hon'ble Energy Minister/ Secretary, Ministry of Power, Govt. of India, New Delhi/ Chairman, Bihar Electricity Regulatory Commission, Patna/ Principal Secretary, Finance Deptt., Bihar, Patna/ Principal Secretary, Revenue and Land Reforms Deptt., Bihar, Patna/ Secretary, Planning and Development Deptt., Bihar, Patna/ All Govt. Deptt./ Head of all Deptt./ Chairman-cum-Managing Director, NTPC, SCOPE Complex, Lodhi Road, New Delhi/Regional Executive Director, East-I, NTPC, Loknayak Jaiprakash Bhawan, Patna/ Accounts Section, Energy Deptt., Patna/ Budget Section, Energy Deptt., Patna/ Joint Secretary, Energy Deptt., Bihar, Patna/ Chairman-cum-Managing Director, Bihar State Power (H) Company Ltd, Patna/ Managing Director, Bihar State Power Generation Company Ltd, Patna/ Managing Director, South Bihar Power Distribution Company Ltd, Patna/ Managing Director, North Bihar Power Distribution Company Ltd, Patna/ Managing Director, Bihar State Power Transmission Company Ltd, Patna/ Managing Director, Bihar State Hydroelectric Power Corporation Ltd/ Director, BREDA, Sone Bhawan, Patna/ District Magistrate-Cum-Collector, Begusarai/Muzaffarpur/Aurangabad/ IT Manager, Energy Deptt., Patna for information and necessary action.

Principal Secretary

Annexure-A

Sl. No.	Para No. of Transfer Scheme	Provision as per notification dtd 27.06.2018	Amended Provision
1.	WHEREAS CLAUSE (VIII)(d)	Further on the matter of Badam coal block, which has been allotted to BSPGCL, it has been agreed between NTPC and BSPGCL that in view of the difficulties being faced by BSPGCL in development of the coal block, BSPGCL would surrender the coal block to the Ministry of Coal (MoC), Govt. of India. Consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.	Whereas the Ministry of Coal, Govt. of India vide its letter no. 23014/4/2018-CLD dt. 5th Sept. 2018, has decided to transfer the bridge linkage of BTPS Stage-II (2x250 MW) to NTPC in the event of NTPC taking over the Badam Coal Block. Therefore, it has been agreed between NTPC and BSPGCL that the Badam Coal Block, allocated to BTPS Stage-II, shall be assigned to NTPC in terms of the allotment agreement dated 30.03.2015 between BSPGCL and Ministry of Coal, GoI for the Badam Coal Block. All liabilities except assests related liabilities pertaining to Badam Coal Block accruing for the period prior to the Date of Transfer of Coal Block to NTPC shall be to the account of BSPGCL.
	WHEREAS CLAUSE (IX)(b)	For Badam coal block, post the surrender by BSPGCL,	deleted

		consequent penalties, levies or surrender costs (if any), would be added to the BTPS consideration payable by NTPC and such costs may be included for determination of tariff, subject to the approval by the CERC. In the case of disallowance of these costs by CERC, NTPC may recover these costs subsequently post takeover from the Discoms, on mutually agreed terms in the ratio of PPA.	
	SCHEDULE 'A' Part-1: BTPS SPECIFIED UNDERTAKINGS	No provision	New Para 10 is inserted after the existing para 9 as under: "**10. Badam Coal Block** The Badam Coal Block allocated to BSPGCL for end use of the Barauni Thermal Power Station Stage-II shall be assigned to NTPC in terms of the allotment agreement dated 30.03.2015 between BSPGCL and MoC, GoI for the Badam Coal Block.

बिहार सरकार
ऊर्जा विभाग

अधिसूचना

संख्या–प्र0 / BSPGCL–01 / 2018(खंड–I) 11 दिनांक 17. / 12. / 2018

बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 (संशोधन)

विद्युत् अधिनियम, 2003 की धारा 131, 134 एवं अन्य लागू उपबंधों के तहत प्रदत्त शक्तियों का प्रयोग करते हुए, राज्य सरकार द्वारा अधिसूचना सं० 05 दिनांक 27.06.2018 (बिहार गज़ट सं० पटना 641 दिनांक 06.07.2018) के माध्यम से BSPGCL के (क) बेगुसराय में स्थित बरौनी थर्मल पावर स्टेशन (BTPS) स्टेज-1 तथा स्टेज-2; (ख) नबीनगर पावर जेनरेटिंग कंपनी प्राइवेट लिमिटेड (NPGCL) में हिस्सापूँजी योगदान और (ग) कांटी बिजली उत्पादन निगम लिमिटेड (KBUNL) में हिस्सापूँजी योगदान के तहत् BSPGCL में निहित परिसंपत्तियों, हितों, अधिकारों, निर्दिष्ट संपत्तियों , निर्दिष्ट देयताएं और निर्दिष्ट कर्मियों को NTPC लिमिटेड को हस्तांतरण के उद्देश्य हेतु 'बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018' ("अंतरण योजना") अधिसूचित की गयी है।

उपर्युक्त अंतरण योजना में बरौनी स्टेज-II (2x250 मेगावाट) हेतु कोयला आवंटन के संदर्भ में यह उल्लिखित है कि BSPGCL बादम कोल ब्लॉक कोयला मंत्रालय, भारत सरकार को वापस कर देगा तथा भारत सरकार की SHAKTI योजना, 2017 के तहत कोयला मंत्रालय, भारत सरकार के समक्ष कोयला आवंटन हेतु आवेदन करेगा।

चूँकि कोयला मंत्रालय, भारत सरकार ने प्रासंगित पत्र सं० 23014/4/2018-CLD दिनांक 05.09.2018 के माध्यम से उर्जा क्षेत्र के लिए SLC(LT) की बैठक की कार्यवाही अग्रसारित किया है जिसमें कोयला मंत्रालय ने बादम कोल ब्लॉक का NTPC द्वारा अधिग्रहण की स्थिति में बरौनी थर्मल पावर स्टेशन स्टेज-II के लिए ब्रिज लिंकेज को NTPC को हस्तांतरित करने को अनुमोदित किया है।

उपर्युक्त पर विचार करते हुए अंतरण योजना में बादम कोल ब्लॉक से सम्बंधित विशिष्ट उपबंधों को तत्क्षण प्रभाव से, जैसा कि इसके अनुसूची-क में उपबंधित है, एतद् द्वारा संशोधित किया जाता है।

तत्पश्चात, अधिसूचना सं० प्र०/BSPGCL/01/2018/08 दिनांक 07.08.2018 के माध्यम से अधिसूचित बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 के अंतरण की प्रभावी तिथि (बिहार गज़ट सं० पटना 761 दिनांक 09.08.2018) का आंशिक संशोधन करते हुए राज्य सरकार एतद द्वारा दिनांक 15.12.2018 को बेगुसराय स्थित बरौनी थर्मल पावर स्टेशन (BTPS) स्टेज-I तथा स्टेज-II के बिहार विद्युत् उत्पादन उपक्रम अंतरण योजना, 2018 के अंतर्गत अंतरण की प्रभावी तिथि तथा निहित परिसंपत्तियों, हितों, अधिकारों, निर्दिष्ट संपत्तियों , निर्दिष्ट देयताएं और निर्दिष्ट कर्मियों को BSPGCL से NTPC लिमिटेड को हस्तांतरण की तिथि के रूप में घोषित किया जाता है।

नोटः- अंतरण योजना के हिंदी संस्करण के किसी बिंदु या विवरणी पर अस्पष्टता अथवा संशय की स्थिति में अंग्रेजी संस्करण मान्य होगा ।

यह अधिसूचना तुरंत के प्रभाव से प्रवृत होगी।

बिहार- राज्यपाल के आदेश से,

ह0/–

(प्रत्यय अमृत)

सरकार के प्रधान सचिव।

ज्ञापांक–प्र0/BSPGCL–01/2018(खंड–I) /पटना, दिनांक–

प्रतिलिपिः–उप सचिव, प्रेस (ई–गजट कौंधांग), वित्त विभाग, बिहार, पटना को बिहार राजपत्र के अगामी असाधारण अंक में मुद्रण हेतु (सी0डी0 एवं दो हार्ड कॉपी के साथ) प्रेषित।

2 उनसे अनुरोध है कि प्रकाशित गजट की 100 (एक सौ) प्रतियों ऊर्जा विभाग, बिहार सरकार को उपलब्ध कराने की कृपा की जाय।

ह0/–

सरकार के प्रधान सचिव।

ज्ञापांक–प्र0/BSPGCL–01/2018(खंड–I) 3121 /पटना, दिनांक– 14/12/2018

प्रतिलिपिः–मा0 मुख्यमंत्री के प्रधान सचिव, मुख्यमंत्री सचिवालय, पटना/मुख्य सचिव के प्रधान आप्त सचिव/मा0 मंत्री ऊर्जा के आप्त सचिव/सचिव, विद्युत मंत्रालय, भारत सरकार, नई दिल्ली/अध्यक्ष, बिहार विद्युत विनियामक आयोग, पटना/प्रधान सचिव, वित्त विभाग, बिहार, पटना/प्रधान सचिव, राजस्व एवं भूमि सुधार विभाग, बिहार, पटना/सचिव, योजना एवं विकास विभाग, बिहार, पटना/सरकार के सभी विभाग/सभी विभागाध्यक्ष/अध्यक्ष–सह–प्रबन्ध निदेशक, एन0टी0पी0सी0, स्कोप कम्पलेक्स, लोधी रोड, नई दिल्ली/क्षेत्रीय कार्यकारी निदेशक, पूरव–I एन0टी0पी0सी0–लोकनायक जयप्रकाश भवन, पटना/लेखा शाखा, ऊर्जा विभाग, पटना/बजट शाखा, ऊर्जा विभाग, पटना/संयुक्त सचिव, ऊर्जा विभाग, बिहार, पटना/अध्यक्ष–सह–प्रबन्ध निदेशक, बिहार स्टेट पावर (हो0) कं0 लि0, पटना/प्रबन्ध निदेशक, बिहार स्टेट पावर जेनरेशन कं0 लि0, पटना/प्रबन्ध निदेशक, साउथ/नॉर्थ बिहार पावर डिस्ट्रीब्यूशन कं0 लि0, पटना/ प्रबन्ध निदेशक, बिहार स्टेट पावर ट्रान्समिशन कं0 लि0, पटना/प्रबन्ध निदेशक, बिहार राज्य जिल विद्युत निगम/निदेशक, ब्रेडा, सोन भवन/समाहर्त्ता, बेगुसराय/मुजफ्फरपुर/औरंगाबाद एवं आई0टी0 मैनेजर, ऊर्जा विभाग, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

सरकार के प्रधान सचिव।

क्रम सं०	अंतरण योजना का अनुच्छेद सं०	अधिसूचना दिनांक 27.06.2018 के अनुसार प्रावधान	संशोधित प्रावधान
1.	जबकि खंड (VIII)(घ)	यह भी कि BSPGCL को आवंटित बादम कोल ब्लॉक के सम्बन्ध में NTPC एवं BSPGCL के बीच यह भी सहमति बनी है कि उक्त कोयला ब्लॉक को विकसित करने में आ रही कठिनाईयों को देखते हुए BSPGCL द्वारा इसे भारत सरकार के कोयला मंत्रालय को वापस सौंप दिया जाएगा। इसके परिणाम स्वरुप यदि कोई जुर्माना, वसूली या समर्पण शुल्क भारित किया जाता है, तो उसे NTPC द्वारा BTPS के स्वामित्व हस्तांतरण के एवज में भुगतेय अंतरण निधि में जोड़ा जाएगा तथा उस रकम को BTPS के विद्युत् टैरिफ में केन्द्रीय विद्युत् विनियामक आयोग से स्वीकृति प्राप्त कर समायोजित किया जाएगा । यदि केन्द्रीय विद्युत् विनियामक आयोग द्वारा उक्त समायोजन की स्वीकृति नहीं दी जाती है तो वैसी परिस्थिति में BTPS के स्वामित्व ग्राहण के पश्चात NTPC उक्त राशि को परस्पर मानी शर्तों पर PPA अनुपातिक आधार पर वितरण कम्पनीयों से प्राप्त कर सकता है।	जबकि कोयला मंत्रालय, भारत सरकार ने पत्र संख्या 23014/4/2018-CLD दिनांक 6 सितंबर 2018 के माध्यम से बीटीपीएस स्टेज-II (2x250 मेगावाट) हेतु NTPC को ब्रिज लिंकेज स्थानांतरित करने की स्वीकृति इस शर्त के साथ दी है कि NTPC बादम कोल ब्लॉक को develop करेगा। इसलिए BSPGCL तथा NTPC के बीच यह सहमति बनी है कि बीटीपीएस स्टेज-II हेतु BSPGCL को आवंटित बादम कोल ब्लॉक BSPGCL एवं कोयला मंत्रालय, भारत सरकार के बीच बादम कोल ब्लॉक हेतु दिनांक 30.03.2015 को संपन्न आवंटन समझौते के शर्तों पर NTPC को सौंपा जाएगा। कोल ब्लॉक के NTPC को हस्तांतरण की तारीख के पुर्व की अवधि की बादम कोल ब्लॉक की आस्तियों संबंधी देनदारियों को छोड़कर उक्त कोल ब्लॉक से संबंधित सभी देनदारियां BSPGCL की होंगी।
2.	जबकि खंड (IX)(ख)	बादम कोल ब्लॉक के लिए, BSPGCL द्वारा कोल ब्लॉक को वापस सौपने के पश्चात, भारित जुर्माना, वसुली या समर्पण शुल्क (यदि कोई होता है), को BTPS के स्वामित्व हस्तांतरण के एवज में भुगतेय अंतरण निधि में जोड़ा जाएगा	विलोपित

		तथा उस रकम को BTPS के विद्युत् टैरिफ में केन्द्रीय विद्युत् विनियामक आयोग से स्वीकृति प्राप्त कर समायोजित किया जाएगा । यदि केन्द्रीय विद्युत् विनियामक आयोग द्वारा उक्त समायोजन की स्वीकृति नहीं दी जाती है तो वैसी परिस्थिति में BTPS के स्वामित्व ग्रहण के पश्चात NTPC उक्त राशि को परस्पर मानी शर्तों पर PPA अनुपातिक आधार पर वितरण कम्पनीयों से प्राप्त कर सकता है ।	
3.	अनुसूची 'क' भाग- I: निर्दिष्ट उपक्रम बीटीपीएस	कोई प्रावधान नहीं	मौजूदा अनुच्छेद 9 के बाद नया अनुच्छेद 10 डाला गया है: **"10. बादम कोल ब्लॉक** बरौनी थर्मल पावर स्टेशन स्टेज-II के अंतिम उपयोग हेतु BSPGCL को आवंटित बादम कोल ब्लॉक BSPGCL एवं कोयला मंत्रालय, भारत सरकार के बीच बादम कोल ब्लॉक हेतु दिनांक 30.03.2015 को संपन्न आवंटन समझौते के शर्तों पर NTPC को सौंपा जाएगा।

Annexure - B

No. 11/27/2017-Th-II
Government of India
Ministry of Power

Shram Shakti Bhawan, Rafi Marg,
New Delhi, dated: 21st June, 2018

To,

The Principal Secretary,
Energy Department,
Government of Bihar,
8, Daroga Prasad Rai Path,
Patna, Bihar - 800001

Subject: **Allocation of 100% Power to Bihar from Barauni Thermal Power Station under transfer to NTPC Ltd. - regarding.**

Sir,

I am directed to refer to Government of Bihar Letter no. 29/Pr.S. Cell dated 21.05.2018 on the subject mentioned above and to say that the proposal for allocation of 100% power from existing Barauni TPS 2x110 MW Stage-I and Barauni TPS, Extension, 2x250 MW Stage -II (under construction) to State Government of Bihar, consequent upon transfer of the project to NTPC, has been considered and it has been decided that there is no new allocation is to be done in the matter. Hence, 100% power from Barauni TPS will continue to flow to the State of Bihar as per the extant PPAs and the MoU signed by NTPC with State Government of Bihar on 15.05.2018.

2. This issues with the approval of Hon'ble Minister of State for Power, (I/C).

Yours faithfully,

21/06/18

(Anita Saini)
Under Secretary to the Government of India
Telefax: 23719710

ANNEXURE-C

PART 1

FORM- 15

Details of Source wise Fuel for Computation of Energy Charges[1]

Name of the Petitioner _____

Name of the Generating Station _____

S. No.	Month	Unit	For preceding 3rd Month (from COD or from 1.4.2019 as the case may be)			For preceding 2nd Month (from COD or from 1.4.2019 as the case may be)		For preceding 1st Month (from COD or from 1.4.2019 as the case may be)	
			Domestic Source (1)	Domestic Source (2)	Imported	Domestic	Imported	Domestic	Imported
A)	**OPENING QUANTITY**								
1	Opening Quantity of Coal/Lignite	(MMT)							
2	Value of Stock								
B)	**QUANTITY**								
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	(MMT)							
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	(MMT)							
5	Coal supplied by Coal/Lignite Company (3+4)	(MMT)							
6	Normative Transit & Handling Losses (For	(MMT)							

S. No.	Month	Unit	For preceding 3rd Month (from COD or from 1.4.2019 as the case may be)			For preceding 2nd Month (from COD or from 1.4.2019 as the case may be)		For preceding 1st Month (from COD or from 1.4.2019 as the case may be)	
	coal/Lignite based Projects)								
7	Net coal / Lignite Supplied (3-4)	(MMT)							
C)	**PRICE**								
8	Amount charged by the Coal /Lignite Company	(Rs.)							
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	(Rs.)							
10	Handling, Sampling and such other similar charges								
11	Total amount Charged (8+9+10)	(Rs.)							
D)	**TRANSPORATION**								
12	Transportation charges by rail/ship/road transport	(Rs.)							
	By Rail								
	By Road								
	By Ship								
	……..								
13	Adjustment (+/-) in amount charged made by	(Rs.)							

S. No.	Month	Unit	For preceding 3rd Month (from COD or from 1.4.2019 as the case may be)			For preceding 2nd Month (from COD or from 1.4.2019 as the case may be)		For preceding 1st Month (from COD or from 1.4.2019 as the case may be)	
	Railways/Transport Company								
14	Demurrage Charges, if any	(Rs.)							
15	Cost of diesel in transporting coal through MGR system, if applicable	(Rs.)							
16	Total Transportation Charges (12+13+14+15)	(Rs.)							
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	(Rs.)							
E)	**TOTAL COST**								
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs./MT							
19	Blending Ratio (Domestic/Imported)								
20	Weighted average cost of coal/ Lignite for preceding three months	Rs./MT							
F)	**QUALITY**								
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)							
22	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)							

S. No.	Month	Unit	For preceding 3rd Month (from COD or from 1.4.2019 as the case may be)			For preceding 2nd Month (from COD or from 1.4.2019 as the case may be)		For preceding 1st Month (from COD or from 1.4.2019 as the case may be)	
23	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)							
24	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)							
25	Weighted average GCV of coal/ Lignite as Billed	(kCal/Kg)							
26	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)							
27	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)							
28	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)							
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)							
30	Weighted average GCV of coal/ Lignite as Received	(kCal/Kg)							

Note:

1. Similar details to be furnished for natural gas/liquid fuel for CCGT station and secondary fuel oil for coal/lignite based thermal plants with appropriate units.
2. As billed and as received GCV, quantity of coal, and price should be submitted as certified by statutory auditor.
3. Details to be provided for each source separately. In case of more than one source, add additional column.
4. Break up of the amount charged by the Coal Company is to be provided separately.

(Petitioner)

PART 1

FORM- 15

Details of Source wise Fuel for Computation of Energy Charges[1]

Name of the Petitioner _____

Name of the Generating Station _____

Sr. No.	Month-wise	Unit	For Existing Plants Year wise and Month-wise details for the period 2024-29 (For preceding 12 months)							
			Domestic Source (1)	……	Domestic Source (n)	Integrated Mine (Basket)	Integrated Mine (Captive)	E-Auction	Imported	Others (specify)
A)	**OPENING QUANTITY**									
1	Opening Quantity of Coal/Lignite	(MMT)								
2	Value of Stock									
B)	**QUANTITY**									
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company for the particular month giving complete details of mode of transportation used for transportation along with quantity.	(MMT)								
	By Rail									
	By Road									
	By Ship									

Sr. No.	Month-wise	Unit	For Existing Plants Year wise and Month-wise details for the period 2024-29 (For preceding 12 months)							
			Domestic Source (1)	……	Domestic Source (n)	Integrated Mine (Basket)	Integrated Mine (Captive)	E-Auction	Imported	Others (specify)
	By MGR									
	By any other mode (specify)									
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company *	(MMT)								
5	Coal supplied by Coal/Lignite Company (3+4)	(MMT)								
6	Actual Transit & Handling Losses (For coal/Lignite based Projects) specify the source	(MMT)								
7	Actual coal / Lignite received	(MMT)								
C)	**PRICE**									
8	Amount charged by the Coal /Lignite Company	(Rs.)								
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company *	(Rs.)								
10	Unloading, Handling and Sampling charges.									
	Unloading charges									
	Handling charges									
	Sampling charges									

Sr. No.	Month-wise	Unit	For Existing Plants Year wise and Month-wise details for the period 2024-29 (For preceding 12 months)							
			Domestic Source (1)	……	Domestic Source (n)	Integrated Mine (Basket)	Integrated Mine (Captive)	E-Auction	Imported	Others (specify)
11	Total amount Charged (8+9+10)	(Rs.)								
D)	**TRANSPORATION**									
12	Transportation charges by rail/ship/road transport	(Rs.)								
	By Rail									
	By Road									
	By Ship									
	By MGR									
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)								
14	Demurrage Charges, if any	(Rs.)								
15	Cost of fuel in transporting coal through MGR system, if applicable	(Rs.)								
16	Total Transportation Charges (12+13+14+15)	(Rs.)								
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	(Rs.)								
E)	**TOTAL COST**									
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs./MT								

Sr. No.	Month-wise	Unit	For Existing Plants Year wise and Month-wise details for the period 2024-29 (For preceding 12 months)							
			Domestic Source (1)	……	Domestic Source (n)	Integrated Mine (Basket)	Integrated Mine (Captive)	E-Auction	Imported	Others (specify)
19	Blending Ratio (Domestic/Imported)									
20	Weighted average cost of coal/ Lignite for preceding twelve months	Rs./MT								
F)	**QUALITY**									
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)								
22	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)								
23	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)								
24	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)								
25	Weighted average GCV of coal/ Lignite as Billed	(kCal/Kg)								
26	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)								
27	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)								

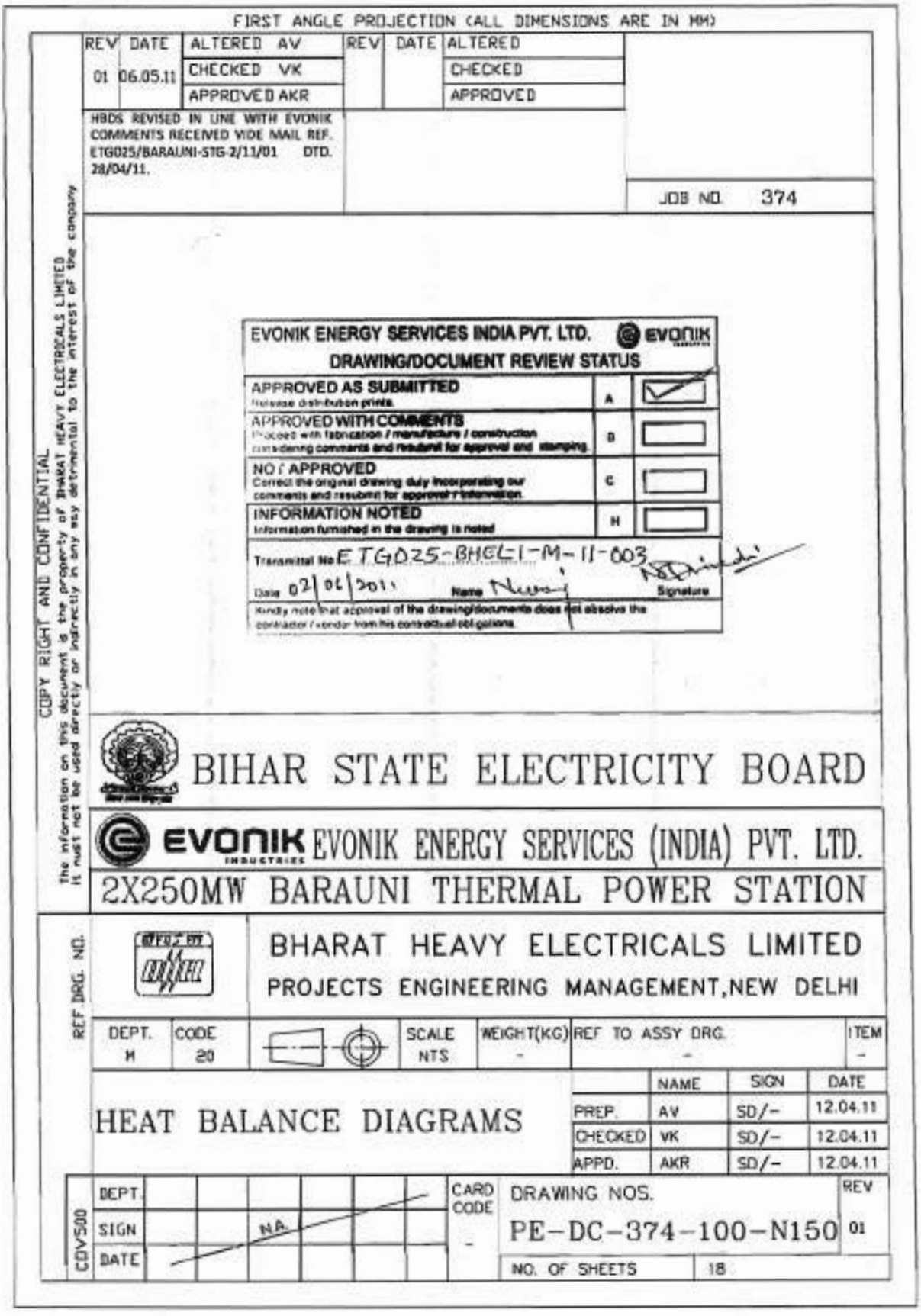
Sr. No.	Month-wise	Unit	For Existing Plants Year wise and Month-wise details for the period 2024-29 (For preceding 12 months)							
			Domestic Source (1)	……	Domestic Source (n)	Integrated Mine (Basket)	Integrated Mine (Captive)	E-Auction	Imported	Others (specify)
28	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)								
29	GCV of Imported Coal supplied as received at Station	(kCal/Kg)								
30	Weighted average GCV of coal/ Lignite as Received	(kCal/Kg)								

(*specifying the period of adjustment along with reason and support document for the adjustment)

Note:

1. Similar details to be furnished for natural gas/liquid fuel for CCGT station and secondary fuel oil for coal/lignite based thermal plants with appropriate units.
2. As billed and as received GCV, quantity of coal, and price should be submitted as certified by statutory auditor.
3. The action taken to address the difference in GCV between as billed and as received should be submitted along with the petition.
4. The details of source wise fuel for computation of energy charges should be provided on year wise in above format along with month wise calculation as may be required by the Commission.
5. Details to be provided for each source separately. In case of more than one source, add additional column.
6. Break-up of the amount charged by the Coal Company is to be provided separately.
7. Distance of Integrated Mines from Generating Station, if applicable, is to be provided separately.

(Petitioner)



FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM)

REV	DATE	ALTERED AV	REV	DATE	ALTERED
01	06.05.11	CHECKED VK			CHECKED
		APPROVED AKR			APPROVED

HBDS REVISED IN LINE WITH EVONIK COMMENTS RECEIVED VIDE MAIL REF. ETG025/BARAUNI-STG-2/11/01 DTD. 28/04/11.

JOB NO. 374

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It must not be used directly or indirectly in any way detrimental to the interest of the company

EVONIK ENERGY SERVICES INDIA PVT. LTD. EVONIK
DRAWING/DOCUMENT REVIEW STATUS

APPROVED AS SUBMITTED Release distribution prints.	A	✓
APPROVED WITH COMMENTS Proceed with fabrication / manufacture / construction considering comments and resubmit for approval and stamping.	B	
NOT APPROVED Correct the original drawing duly incorporating our comments and resubmit for approval / information.	C	
INFORMATION NOTED Information furnished in the drawing is noted	N	

Transmittal No ETG025-BHEL1-M-11-003
Date 02/06/2011 Name Neeraj Signature
Kindly note that approval of the drawing/documents does not absolve the contractor / vendor from his contractual obligations.

BIHAR STATE ELECTRICITY BOARD

EVONIK INDUSTRIES EVONIK ENERGY SERVICES (INDIA) PVT. LTD.

2X250MW BARAUNI THERMAL POWER STATION

REF. DRG. NO.

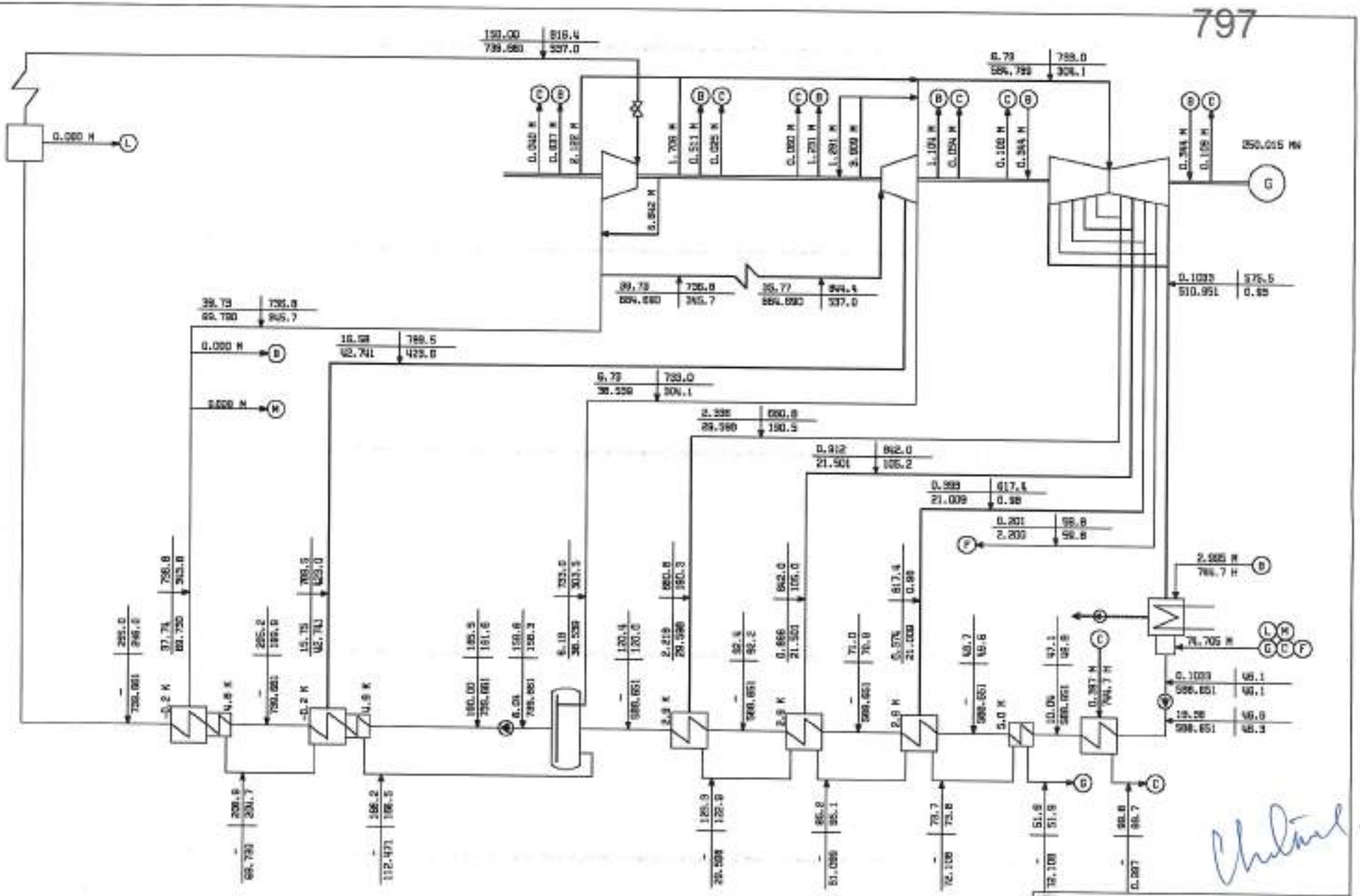
BHARAT HEAVY ELECTRICALS LIMITED
PROJECTS ENGINEERING MANAGEMENT, NEW DELHI

DEPT.	CODE	SCALE	WEIGHT(KG)	REF TO ASSY DRG.	ITEM
M	20	NTS	-	-	-

HEAT BALANCE DIAGRAMS

	NAME	SIGN	DATE
PREP.	AV	SD/-	12.04.11
CHECKED	VK	SD/-	12.04.11
APPD.	AKR	SD/-	12.04.11

CDVS00								CARD CODE	DRAWING NOS.	REV
DEPT.								-	PE-DC-374-100-N150	01
SIGN			N.A.						NO. OF SHEETS 18	
DATE										



TURBINE CYCLE HEAT RATE = 1947.1Kcal/KW/Hr

BIHAR STATE ELECTRICITY BOARD

EVONIK ENERGY SERVICES (INDIA) PVT. LTD.

2X250MW BARAUNI THERMAL POWER STATION

BHARAT HEAVY ELECTRICALS LTD
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

PREP		250MW OXMU 0.1033ATA BACK PR.
CHKD		
APPD		JOB NO 374
DATE	05.09.03	DRG NO PE - BC - 374 - 100-N05 REV 05

GUARANTEED DATA

DECLARATION SHEET

FORMAT B

Serial No.	Package System	Parameter for Performance guarantee	Value
1.00.00	Steam Generator	a) Capacity in T/Hr of steam at rated steam parameters at superheater & reheater outlet with combination of mills working as per owner's choice and the coal being fired within worst range specified, and Guaranteed emission limits at ESP outlet, corresponding to 100% BMCR and maximum auxiliary steam consumption.	810 TPH (Reheater Outlet Flow is not Guaranteed)
		b) i) Efficiency in percentage at 100% TMCR load with design coal and combination of mills as per owner's choice.	85.60%
		ii) - Do - for 75% (187.5 MW) Turbine rated load.	Not Guaranteed
		c) Air heater air-in leakage (%)at TMCR after 3000 hs. of operation.	12% @ 100% TMCR (based on Gas Flow at Air Heater inlet @ 100% TMCR)
		d) No_x emission ppm (equivalent NO_2) at TMCR at 6% O_2	365 ppm @ 6% O_2
		e) Capacity of each mill with worst coal (Annexure 2, Note 2) at rated fineness, T/hr , i.e. - not less than 70% thru' 200 mesh - not less than 98% thru' 50 mesh	Maximum Capacity - 47.43 Hence, 90% of Max Capacity - **42.69 for Performance Guarantee** (As per resolution sl no. 09, Anx 1, Page No. 3, of MOM dtd 5-6 March, 2009)
		f) Guaranteed maximum percentage reject from mill corresponding to rated capacity with worst coal	1%
		g) Wear life in operating hours of mill parts (mention part name) Mechanical Seal Grinding elements Mill discharge cone and items lined with ceramic	NA Grinding Roll + Bearings : 6000 Inner Cone : 25000 Mill Discharge Valve: 15000

Serial No.	Package System	Parameter for Performance guarantee	Value
		h) Minimum load (%TMCR) at which oil support is Not required for any combination of Mill decided by the Owner with worst coal.	Oil Support is not required above 40% BMCR provided two adjacent Mills are in service with Mill Loading greater than 50% (As per resolution sl no. 09, Anx 1, Page No. 3, of MOM dtd 5-6 March, 2009)
		i) Consumption of fuel oil at 30% of TMCR KL/hr for any combination of Mill decided by the Owner with worst coal.	NIL @ 40% BMCR as per item (h) above
		j) Furnace exit gas temperature, deg. C at TMCR (specify location)	Not Guaranteed
		k) Superheater and Reheater outlet steam temperature will be maintained at 540±5°C for 60-100% TMCR	Yes
2.00.00	Electrostatic Precipitator (ESP)	a) Following Emission limits through stack will be achieved at 12% CO_2 while the boiler is running with worst coal (Annexure 2, Note 3) and operating at 100% BMCR	
		a) 26 mg/Nm^3 with all fields in operation .	100 mg/Nm^3 with n-1 fields in service @ 100% BMCR Worst Coal. (As per Sheet 3 of 4, Annexure 5.1 of DPR)
		b) 50 mg/Nm^3 with any one field of Owner's choice of each pass standby	
		b) Pressure drop across ESP, corresponding to gas flow at Boiler Max. continuous rating (BMCR), mm water column.	25 mmWC
3.00.00	Turbine Generator (TG)	a) i) Heat rate in Kcal/Kwhr at 100% (250MW) turbine rated load under rated steam conditions and condenser vacuum of 76mm HgA with zero make up.	1947.1Kcal/KWHr Refer HBD: PE-DC-H07-100-N151, Rev.01
		ii) Do for 75% (187.5 MW) Turbine rated load	Not Guaranteed
		b) Max continuous output (MW) under rated steam conditions at condenser vacuum of 89 mm HgA with 3% make up.	250MW

Annexure - 8

15/वि०-04-401/2008-Part-II- 189

Government of Bihar
Water Resources Department

Resolution

Dated:- 03.10.16

Subject – Increment in Water charges rate for Industrial, Commercial and Municipal use.

Under Para-62 of Bihar Irrigation Act, 1997 (Bihar Act - 11, 1998) there is provision for fixation of water charges rate for Industrial, Commercial and Municipal use.

Water charges rate ₹ 4.50 (Rupees four and paise fifty) only per thousand gallon for Industrial, Commercial and Municipal use effective from 1st April 1998 is hereby increased to ₹ 18.00 (Rupees eighteen) only per thousand gallon.

New Water charges rate will be effective from 3rd October 2016.

This has the approval of the State Cabinet.

By the order of Governor of Bihar

03.10.16
(Yogeshwar Dhari Singh)
Joint Secretary (Engineering)
Water Resources Department

Memo No- 15/वि०-04-401/2008-Part-II- 189 Patna, Dated- 03.10.16

Copy to :- Accountant General (Account & Entitlement), Bihar/ Accountant General (Audit), Bihar, Birchand Patel Marg, Patna for information and necessary action.

03.10.16
(Yogeshwar Dhari Singh)
Joint Secretary (Engineering)
Water Resources Department

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Memo No- 15/ सि०-04-401/2008-Part-II- 189 Patna, Dated- 03.10.16

Copy to :- PA to Honorable Minister, Water Resources Department, Bihar, Patna /Chief Secretary, Bihar, Patna /Principal Secretary, Cabinet Secretariat Department, Patna /Principal Secretary Finance Department, Patna /Principal Secretary, Industry Department, Patna /Principal Secretary, Town Development and Housing Department Patna /Personal Assistant to the Principal Secretary, Water Resources Department, Patna /All Engineer in Chief /All Chief Engineer /All Superintending Engineer /All Joint Secretary /All Executive Engineer, Water Resources Department for information and necessary action.

03.10.16
(Yogeshwar Dhari Singh)
Joint Secretary (Engineering)
Water Resources Department

Memo No- 15/ सि०-04-401/2008-Part-II- 189 Patna, Dated- 03.10.16

Copy to :- Superintendent, Secretariat Printing Press, Gulzarbagh, Patna in two hard copies along with CD for information and necessary action. Please publish it in the next extra ordinary publication and provide 200 (Two hundred) copies to Water Resources Department.

03.10.16
(Yogeshwar Dhari Singh)
Joint Secretary (Engineering)
Water Resources Department

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15/रा०-04-401/2008-पार्ट-II- 189

बिहार सरकार
जल संसाधन विभाग

संकल्प

दिनांक- 03.10.16

विषय – औद्योगिक, व्यावसायिक एवं म्युनिसिपल उपयोग हेतु जल प्रभार दर में वृद्धि।

बिहार सिंचाई अधिनियम, 1997 (बिहार अधिनियम-11, 1998) की कंडिका 62 के अधीन औद्योगिक, व्यावसायिक एवं म्युनिसिपल उपयोग हेतु जल प्रभार दर निर्धारित करने का प्रावधान है।

औद्योगिक, व्यावसायिक एवं म्युनिसिपल उपयोग हेतु 01 अप्रैल 1998 से प्रभावी जल प्रभार दर ₹ 4.50 (चार रुपये पचास पैसे) प्रति हजार गैलन में वृद्धि करके ₹ 16.00 (अठारह) प्रति हजार गैलन निर्धारित किया जाता है ।

नया जल प्रभार दर दिनांक 03.10.2016 से प्रभावी होगा।

इस पर मंत्रिपरिषद की स्वीकृति प्राप्त है।

बिहार राज्यपाल के आदेश से,

03.10.16
(योगेश्वर धारी सिंह)
संयुक्त सचिव (अभियंत्रण)
जल संसाधन विभाग

ज्ञापांक-15/रा०-04-401/2008-पार्ट-II- 189 /पटना दिनांक- 03.10.16

प्रतिलिपि :- महालेखाकार (लेखा एवं हकदारी), बिहार /महालेखाकार (लेखा परीक्षा), बिहार, वीरचन्द पटेल मार्ग, पटना को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

03.10.16
(योगेश्वर धारी सिंह)
संयुक्त सचिव (अभियंत्रण)
जल संसाधन विभाग

CM

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ज्ञापांक–15/रा०–04–401/2008–पार्ट–II- 189 /पटना, दिनांक:- 03.10.16

प्रतिलिपि :– माननीय मंत्री, जल संसाधन विभाग, बिहार, पटना के आप्त सचिव /मुख्य सचिव, बिहार, पटना /प्रधान सचिव, मंत्रिमंडल सचिवालय विभाग, पटना /प्रधान सचिव, वित्त विभाग, पटना /प्रधान सचिव, उद्योग विभाग, पटना /प्रधान सचिव, नगर विकास एवं आवास विभाग, पटना /प्रधान सचिव के निजी सहायक, जल ससाधन विभाग, पटना /सभी अभियंता प्रमुख /सभी मुख्य अभियंता /सभी संयुक्त सचिव /सभी अधीक्षण अभियंता /सभी कार्यपालक अभियंता, जल संसाधन विभाग को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

03.10.16
(योगेश्वर धारी सिंह)
संयुक्त सचिव (अभियंत्रण)
जल संसाधन विभाग

ज्ञापांक:– 15/रा०–04–401/2008–पार्ट–II- 189 /पटना, दिनांक:–03.10.16

प्रतिलिपि :– अधीक्षक, सचिवालय मुद्रणालय, गुलजारबाग, पटना को दो हार्ड कॉपी एवं सी०डी० के साथ सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित । कृपया राजपत्र के अगामी असाधारण अंक मे इसे प्रकाशित कराकर दो सौ प्रतियाँ जल संसाधन विभाग को उपलब्ध करायी जाय।

03.10.16
(योगेश्वर धारी सिंह)
संयुक्त सचिव (अभियंत्रण)
जल संसाधन विभाग

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AN

REPORT

ON

HEALTH ASSESSMENT & REMEDIAL MEASURES FOR VARIOUS BUILDINGS OF BTPS, BARAUNI

CSIR - CENTRAL BUILDING RESEARCH INSTITUTE

ROORKEE - 247667

MARCH, 2020

Report No. : OBM/(C)/0459

Title **:** Health Assessment & Remedial Measures for Various Buildings of BTPS, Barauni

Project Team : Dr S.R. Karade, Sr. Principal Scientist (Principal Investigator)
Dr R. Siva Chidambaram, Scientist (Co-Principal Investigator)
Dr P.C. Thapliyal, Sr. Principal Scientist
Shri Rajeev Sharma, Sr. Tech. Officer and
Technical Staff

S.R. Karade
Principal Investigator

AN INTERIM REPORT ON

HEALTH ASSESSMENT & REMEDIAL MEASURES FOR VARIOUS BUILDINGS OF BTPS, BARAUNI

INTRODUCTION

The Barauni Thermal Power Station (BTPS), Barauni (Bihar) was commissioned in the year 1962 by the Bihar State Electricity Board (BSEB). In 2017, the operation of BTPS was stopped due to various reasons. Subsequently, the National Thermal Power Corporation (NTPC) was requested to take it over and run this plant. Besides the plant structures, BTPS has an adjacent township of more than one thousand (1000) residential quarters of various types, such as Field Hostel, Hospital Building, School Building, Community Centre, Bank Building and CISF Building. Since these buildings are quite old, NTPC is planning to make efforts to renovate and use them for the NTPC officials. However, before doing so, the health assessment of these buildings is required keeping in view the age and deterioration of these structures. In this regard, NTPC requested CSIR-Central Building Research Institute (CBRI), Roorkee to make an assessment of the building structures in BTPS township area. Accordingly, a team of CBRI Scientists, Dr S.R. Karade and Dr R. Siva Chidambaram reached BTPS on 24th August 2018 for a preliminary visit to the buildings structures in the township.

On the basis of the preliminary investigation of the Residential Quarters, Field Hostel, Bank Building, Community Centre, CISF Building, School Buildings and the discussions with the NTPC engineers, the following scope of work for detailed investigation was decided:

SCOPE OF THE WORK

The investigation work can be comprised of:

1. Visual inspection of different types of residential staff quarters, community centre, school building, CISF building, BOI buildings and Officers Hostel buildings.
2. NDT for assessment of deterioration in concrete quality by Rebound Hammer and ultrasonic test at selected locations in RCC columns/beams/slabs.
3. Rebar locator will be used to determine the exact reinforcement positions and to estimate the diameter of steel at present. (Due to the unavailability of structural drawings)
4. Corrosion assessment on RCC elements such as slab, column will be done using Half Cell Potentiometer, Chlorination test.
5. A summary of the proposed tests to be conducted is given in the Annexure – I.
6. Determination of pH values and chloride content of concrete and soil samples taken from 20 critical locations mainly in and around the township.
7. Assessment of the overall quality of concrete based on the observations and NDT.
8. A detailed report, which will include the test results and appropriate recommendations for repair and protective measures, will be submitted.

INVESTIGATION WORK

The project was awarded to CSIR-CBRI by NTPC in August 2019. Subsequently a team of CSIR-CBRI visited Barauni during 13th to 16th Sept. 2019. Along with the NTPC officials, the team visited various structures and had discussions with Shri Manish Jauhari (CGM, Barauni), Shri S.K. Panda (GM Projects), Shri SP Dubey (AGM, HR), Shri Nabendu Lodh (DGM, Civil) and Shri Vinod Bhoyar (DGM, TS).

The work of core cutting, rebound hammer test, half-cell potential measurement and electrical resistivity measurement was started on 13th Sept, 2019. NTPC engineers, Shri Nabendu Lodh (AGM-Civil) and J.E., (Civil) were present during the proceedings. They participated in the discussions and facilitated the investigation work.

Visual Observations

The team visited different types of buildings in the campus. They inspected the buildings and made observations. These observations are reported, building type wise, in this report.

Field Testing

For an effective assessment of the concrete structural components non-destructive testing (NDT) methods, like rebound hammer and ultrasonic pulse velocity measure-ment (Fig.1 & 2) for strength and quality evaluation; and half cell potential & resistivity measurement for determining corrosion state of the reinforcement were used (Fig. 3 & 4). The locations of the field tests, as agreed, are given in Annexure - I.

Rebound Hammer Test

This method is based on the assessment of the surface hardness of a concrete structure. It is mainly consist of impacting the concrete surface in a standard manner, using a given impact energy and measuring the size of the indentation or rebound. In the most commonly used method a Schmidt rebound hammer is generally used (Figure 1), which consists of a spring-controlled hammer that slides on a plunger. When the plunger is pressed against the surface of the concrete to be tested, the spring-controlled mass rebounds; taking a rider with it along a guide scale indicating the rebound number. It is subsequently converted to an equivalent compressive strength. This method is a simple and quick for evaluation of concrete at site, which makes it very useful in assessing the general quality of concrete. The rebound hammer test is used for assessment of compressive strength of concrete. Since the rebound greatly depends on the surface characteristic of concrete, a number of rebounds need to be taken at the same area and the average value is related to the strength of concrete. For example, if the hammer hits directly over an aggregate, the rebound reading is very high, while if it hits on a porous area, the reading becomes unusually low. Hence any reading, which was unusually high or low than others, was rejected. Further, it must be noted that rebound measurements are affected by various other parameters like smoothness of the concrete surface; moisture content; type of coarse aggregate; size, shape, and rigidity of the concrete element (e.g., a thick wall or beam) and carbonation of the concrete.

Fig. 1 Rebound hammer test

In this investigation a rebound hammer made by Controls Group was used. The readings were taken at different selected locations. Out of 10 readings, 2 highest and 2 lowest were discarded and mean value of remaining 6 are considered. Based on their mean value at a location the corresponding compressive strength was obtained. Further, a correction factor of 50% was used (IS-13311(Part2)-1992) as most of the concrete structures are quite old and carbonated significantly.

Ultrasonic Velocity Test

In this test, the quality of concrete is assessed by measuring the time of travel (in micro-seconds) of ultrasonic pulse passing through the concrete medium. The pulse velocity varies depending on the quality of concrete. It is higher for good quality concrete and lower for the defective or degraded concrete. Presence of cracks or voids in the concrete causes longer travel time for the ultrasonic pulses. Measuring the thickness or length of concrete through which the pulse travels and the travel time, velocity of the ultrasonic wave through the concrete medium is calculated. For different pulse velocities, the criterion for assessing the quality of concrete specified by IS:13311 (Part 1):1992 are shown in Table 1.

Fig. 2 Ultrasonic Pulse Velocity test

Table 1 Relationship between Pulse Velocity and Quality of Concrete

Pulse Velocity (km/s)	Quality of Concrete
>4.5	Excellent
3.5-4.5	Good
3.0-3.5	Medium
< 3.0	Doubtful

Generally, the pulse velocity measuring instrument is also supplied with a calibration curve giving the relationship between velocity and compressive strength. However, it is widely accepted that the ultrasonic concrete test results should preferably be considered for the qualitative assessment only. To assess the quality of the concrete, a TICO Ultrasonic Instrument, a make of Proceq Instruments, Switzerland was used (Fig. 2). Depending upon the site conditions some times direct measurement of ultrasonic velocity is not possible in such cases indirect method is adopted which gives slightly lower values of ultrasonic velocity.

Half Cell Potential Measurement

Half-cell potential (HCP) testing is one way to estimate the corrosion activity of the reinforcing steel in concrete structures at site. Half-cell potential measures the difference in electro-potential between a reference electrode (generally copper-copper sulphate) and the reinforcing steel. (Figure 3) The interpretation criteria, according to ASTM C 876 - 2009, is that the potential readings more negative than -350 mV indicate a 90% probability of corrosion activity, readings between -200 mV and -350 mV indicate an uncertain probability of corrosion activity, and readings more positive than -200 mV indicate a 90% probability of no corrosion activity.

Fig. 3 Half-Cell Potentiometer test

Concrete Resistivity

The corrosion rate of reinforcement depends on various parameters including the electrical resistance of the concrete, which controls the ease with which ions can move through the

concrete in the presence of a potential field. The electrical resistance of concrete depends on the microstructure of the paste and the moisture content of the concrete. Thus, measurement of the resistivity of the concrete is a useful test in conjunction with a half-cell potential survey. In this investigation work, a four-point Wenner probe along with Cannin+ equipment, a make of Proceq was used. The criteria for interpretations of the results as suggested in the Concrete Society (UK) and ACI 222R.1 Reports are given in Table 2.

Fig. 4 Resistivity meter

Table 2 Relationship between concrete resistivity and corrosion rate

Resistivity, kΩ-cm	Corrosion rate
> 20	Low
10 to 20	Low to moderate
5 to 10	High
< 5	Very high

Lab Investigation

To understand the status of the quality of concrete from the buildings, total 9 nos. of concrete cores were extracted using a 50 mm diameter shaft. The cores were subjected to visual observations, compressive strength testing, pH, carbonation and chloride penetration tests. The locations were selected keeping in view the suspected corrosion and safe accessibility. The extracted cores were packed in sealed plastic bags and brought to CBRI for various tests.

In CBRI, after opening the plastic bags the cores were subjected to visual observations and carbonation depth test. Then the cores were cut from the ends and finished to get two parallel surfaces for compressive strength test (Figure 5). Concrete samples from the remaining portion of core from the cut ends and samples from the cores after compression test were obtained to determine chloride content and for pH value measurements.

Observations

Most of the cores received have defects such as cracks, voids, internal damages/cracks, inhomogeneity and honeycombing and presence of foreign materials have been found (Figure 5). Some delamination at outer surface was also observed.

Fig. 5 Defects in concrete cores

Carbonation

Depth of the carbonation in the concrete core samples were measured by spraying a phenolphthalein solution. The pink colour indicates uncarbonated concrete, while the clear portion indicates carbonation. The results of carbonation test reveals that in most of these cores carbonation has taken place and therefore, it is considered as the main cause of concrete deterioration.

Chloride Penetration

The presence of chloride in concrete increases the risk of corrosion of embedded metal. The higher the chloride content, the greater the risk of corrosion in reinforced concrete. All constituents in concrete may contain chlorides or concrete may be contaminated by chloride from the external environment. To minimize the possibility of deterioration of concrete from harmful chemical salts, the levels of such harmful salts in concrete coming from concrete materials, that is, cement, aggregates water and admixtures, as well as by diffusion from the environment should be limited. The total amount of chloride content (as Cl) in the concrete as per IS: 456-2000 is given in Table 3. The code specifies a limit of 0.6 kg/m^3 of concrete for chloride content. The BS code Amendment slip No. 3 to CP 110:Part 1:1972, published on 31 May, 1977 states that the total chloride content of the concrete mix arising from the aggregate together with that from any admixtures and any other source should not in any circumstance exceed 0.35 percent, expressed as a percentage relationship between chloride ion and weight of cement in the mix for 95 percent of the test results and with no results greater than 0.5 percent. On the other hand, ACI 318-1995 allows a maximum water-soluble chloride ion

content of 0.06 percent in prestressed concrete, 0.15 percent for reinforced concrete exposed to chloride in service, 1.0 percent for reinforced concrete that will be dry or protected from moisture in service and 0.3 percent for all other reinforced concrete construction. The total chloride present in concrete is partly as insoluble chloroaluminates and partly in soluble form. It is the soluble chloride in concrete, approximately 50 percent of the total chloride content, which is responsible for the corrosion of reinforcement. Thus, there is no agreement on the threshold limit on chloride content in reinforced concrete.

Table 3 Limits of Chloride Content in Concrete according to IS:456-2000

Types or Use of Concrete	Maximum Total Acid Soluble Chloride Content Expressed as kg/m^3 of Concrete
Concrete containing metal and stream cured at elevated temperature and pre-stressed concrete.	0.4
Reinforced concrete or plain concrete containing embedded metal.	0.6
Concrete not containing embedded metal or any material requiring protection from chloride	3.0

The chloride content of the concrete samples obtained from the cores was determined according to the method given in RILEM Report No. TC 178-TMC: 'Testing and modelling chloride penetration in concrete'. The chloride content by weight of cement was determined considering the cement content in the concrete was 505 kg/m^3 (based on information provided by NTPC). The results are given in table 13, 27, 31 & 34.

pH Value

Hydrogen ion concentration or pH value is a good indicator of the quality of concrete exposed to aggressive environment. For the determination of pH, a 10 g concrete sample was mixed with 100 ml distilled water in a stoppered bottle and was gently shaken in a mechanical shaker for one hour. The same was filtered through ordinary filter paper. The pH of the extract was determined immediately after filtration using a Toshcon CL54+ Digital pH meter.

The pH value of good concrete/ mortar should be between 12 and 13. A high pH value of the samples is indicative of good quality of the mortar and concrete.

Core Strength Testing

The compressive strength of the finished cement core was determined by a UTM as shown in Fig 5. The strength obtained by the test was subsequently converted to equivalent cube strength using the following equation suggested in the Concrete Society (UK) Technical Report No. 11:

$$f_c = \frac{D}{\left(1.5 + \frac{1}{\lambda}\right)} \qquad [1]$$

where f_c = Estimated concrete cube strength,
D = 2.5 for horizontally and 2.3 for vertically drilled cores and
λ = length to diameter ratio of the cores.

This equation is supposed to negate the influences of length to diameter ratios and cylindrical shape of the cores while converting in cube strength. However, there are other parameters such as, moisture content and mechanical damage in removing and finishing the core samples, which may affect the estimated strength for which additional correction factors are suggested in ACI 214 Report. Then again, use of several correction factors can enhance the estimated strength to unrealistic values. Therefore, only the Equation [1] is used for estimation of cube strength.

RESIDENTIAL QUARTERS

There are different types of residential quarters such as GM Bungalow, B-Type, C-Type, CF-Type, DS-Type, D-type EF-Type quarters and Field Hostels. Their present status as observed and the test results are discussed in brief below:

Field Hostel-I

Field Hostel-I is a G+2 storey RCC building structure as shown in Figure 6. The building has L-shaped structure with construction joint. The portico slabs and building sunshades are in deformed shape. Part of the slab has shown no sign of carbonation but the core concrete compressive strength is low. It was also observed that the rebars in the balcony slabs and lintel beams are severely corroded. The corrosion of rebars caused visually observable deflections of the balcony slab (Fig. 7). This causes the cracking in columns at the connection level in the ground storey as shown in Figure 8. During the visit, it was observed that at several places the cover concrete was spalled out due to corrosion of the reinforcement (Fig. 7). In order to assess the extent of damage to the concrete structures, their non-destructive testing is done. It helps in deciding the application of suitable repair materials and techniques.

Fig. 6: Field Hostel – I

Fig. 7: Exposed reinforcement in Cantilever slab of Officers Hostel 1 at Ground Storey

Fig. 8: Crushing of Concrete in Ground Storey Column of Officers Hostel 1

As can be seen from Table 4 & 5, the concrete in the building is deteriorated significantly and has low strength while the steel reinforcement is in highly corroding state. (Table 6).

Table 4 : Rebound hammer test at Field Hostel - I

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent comp. strength (MPa)	Corrected compressive strength (MPa)
Column, 2nd Floor (East facing)	1.5	14	10	12	10	14	12	12	-	-
Column, 1st Floor (East facing)	1.5	20	22	24	20	22	20	21	11.2	7.5
Column 2, 1st Floor (East facing)	1.5	16	18	20	16	18	16	17	6.4	4.3

Column 3, 1st Floor (East facing)	1.5	18	20	16	18	16	18	15	4.0	2.7
Column 4, 1st Floor (East facing)	1.5	16	18	20	16	20	16	18	7.6	5.1

Table 5: Ultra sonic pulse velocity test at Field Hostel - I

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Column 1, GF	250	Could not be recorded		Very poor
Column 2, GF	250	Could not be recorded		Very poor
Column 5, GF	250	112	2.23	Doubtful

Table 6: Half cell potential test on Field Hostel - I

Location	Half cell potential (mV)						
Beam, 2nd Floor (East facing)	-530	-521	-486	-540	-547	-545	-564
Column, 2nd Floor (East facing)	-575	-575	-529	-520	-551	-445	-583
Cantilever slab Ground Floor	-350	-305	-258	-455	-301	-384	-264

Field Hostel-II

The Field Hostel - II is also an RCC Ground + Two Storey Building in "L" shape with Construction joint at the "L" point. The roof slab is severely corroded and reinforcement is completely exposed at several locations. Continuous spalling of concrete cover is noticed across the building. At few locations, the reinforcement with concrete was hanging as shown in Figure 9-14. The cantilever portico of the building is also severely affected by corrosion and seems inclined (deflected shape).

Fig. 9: Field Hostel - II

Fig. 10: Exposed reinforcement in roof Slab

Fig. 11: Exposed reinforcement and hanging reinforcement with a chunk of cover concrete

The concrete was quite weak and could be easily crumbled by hand. The top floor has a parapet wall, which seems very vulnerable. The concrete in beams was carbonated beyond 65 mm depth from the surface. Cracks are visible on most of the walls. The test results are reported in Table 7 – 9 also confirm the above observations.

Table 7: Rebound hammer test at Field Hostel - II

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Compressive strength (MPa)
Beam 1st Floor (West facing	3	Less than rebound hammer value						-	-	-
Beam 1st Floor (South facing	3	16	14	16	14	14	16	15	4	2.7
Beam 1st floor (South facing)	3	12	12	12	14	12	14	13	-	-
Beam 1st Floor (South facing)	3	18	18	16	18	17	18	18	7.6	5.1

Table 8: Ultrasonic Pulse velocity test at Field Hostel-II

Location	Distance (mm)	Time (μ sec)	Velocity (km/sec)	Quality of concrete
Beam 1st Floor (West facing)	Unstable readings			Very poor
Beam Ground Floor (South facing)	250	88.1	2.837	Doubtful
Beam Ground Floor(South facing)	250	81.2	3.078	Medium
Beam Ground Floor (South facing)	250	85.2	2.930	Doubtful

Table 9: Half-cell Potentiometer test at Field Hostel-II

Location	Half cell potential (mV)

Beam 1st floor (West facing)	-400	-405	-436	-462	-431	-423	-490
Beam 1st Floor (South facing)	-431	-366	-354	-340	-376	-335	-438

Fig. 12 Inclined Parapet wall

Fig. 13 Top floor covered with grass and plants

Fig. 14 Collapsed stage of core concrete in beam

Fig. 15 Renovated Type D Quarters

D- Type Quarters

Total of 146 D-Type residential quarters are existing in cluster form at different locations. There are G+1 storey and G+2 storey in D-Type with different staircase patterns. Few quarters in this type have been renovated recently and a few of them are occupied. These buildings are a combination of RCC and masonry construction. Figure 15 shows the renovated Type –D Quarters. NTPC is planning to retain most of the D-Type quarters and only a few have been

renovated by BSEB. Thus an assessment of the extent of damage to the concrete structures is done using NDT to check the current status of the structures.

Table 10: Rebound hammer test at D Type Quaters

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Compressive Strength (MPa)
Slab D6 - 2 Storey vertical (with plaster)	3	38	36	32	42	36	36	37	39.2	26.13
Slab D44 -3 Storey vertical (with plaster)	3	24	22	20	24	22	24	23	17.6	11.73

Table 11: Ultrasonic Pulse velocity Test at D Type Quaters

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Slab D6 - 2 Storey GF indirect method	300	81	3.7	Medium
Slab D6 - 2 Storey GF indirect method	300	77	3.9	Medium
Slab D-44 -3storey head room (indirect method)	300	142	2.1	Doubtful
Slab D-44 -3storey head room (indirect method)	300	239	1.3	Doubtful
Slab D-44 -3storey head room (indirect method)	300	268	1.1	Doubtful
Slab D-44 -3storey head room (indirect method)	300	263	1.1	Doubtful

Table 12: Half-Cell Potential Test at D Type Quaters

Location	Half cell potential (mV)					
D6 - 2 Storey slab	-224	-184	-203	-240	-250	-
D-44 -3storey head room slab	-375	-392	-381	-465	-439	-384

The test results show some deterioration of concrete (Table 10 – 11), while corrosion of reinforcement is ongoing (Table 12)

F-Type Quarters

This type quarters are G+1 Storey type and constructed at different locations. Few buildings are severely damaged and few of them are moderately damaged. In which the roof slab, sunshade slabs and lintel reinforcements are corroded and exposed. Spalling of wall plasters

were noticed all across the buildings. Similarly, water seepage from the first storey roof slab was noticed (Figure 16 - 17). In many of the terraces, proper roof treatment could not be seen while water stagnation was noticed.

Fig. 16: F Type Quarters (spalling/corrosion)

Fig. 17: F Type Quarters (seepage from the roof)

G-Type Quarters

This is G+2 storied RCC structure. Most of these quarters are in the inaccessible state. Well grown banyan tree and vegetations all across the structures have been noticed as shown in Figure13 - 15. RCC columns are severely corroded and volumetric bulging has been noticed with exposed reinforcement at many locations as shown in Figure 20.

Fig. 18: G Type Quarters covered with full of Vegetation

Fig. 19: G Type Quarters full of Vegetation

Fig. 20: Exposed column reinforcement in G Type Quarters

EF Quarters

There are 664 quarters of this type and NTPC is planning to retain 306 quarters. This is also having G+1 storey and G+ 2 storey buildings at different locations. Many quarters in this type are occupied and few of them are getting renovated. The renovation process is undergoing. In few quarters the terrace was restored by using conventional plain cement mortar. Also in few buildings, natural plants have been grown by the residents on the rooftop. This has caused severe seepage at many locations. These types of buildings have four columns on the front side of the building to support the structure and remains are masonry structure. In few quarters the column reinforcement has been corroded and the volumetric difference in the column was noticed. Also, dampness was noticed almost in all buildings due to improper roof treatment. NTPC has a plan to retain 306 quarters and hence a detailed non-destructive testing and corrosion assessment have been carried out to study the extent of damage to the concrete structures.

The NDT results (Table 13 – 15) show that the strength of concrete is degraded and the rebars are corroding (Table 15) has the HCP values are more negative than -350 mV.

Table 13: Rebound Hammer Test at EF Quarters

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Compressive strength (MPa)
Beam EF 299 Ground floor		Less than rebound hammer value						-	-	-
EF - 82		Less than rebound hammer value						-	-	-
Slab EF - 167 kitchen (Vertical)	3	32	30	40	40	30	40	35	36.0	24.0
Slab EF- 164 kitchen (Vertical)	3	38	34	30	34	38	34	35	36.0	24.0
Slab EF -134 kitchen without	3	30	36	22	34	36	22	30	28.0	18.7

removing plaster (Vertical)										
Slab EF -134 kitchen without removing plaster at corrosion area (Vertical)	3	16	18	17	16	17	18	17	10.4	6.9
Sunshade EF - 438 Ground floor	2.13	14	14	16	14	16	14	15	8.0	5.3
Beam EF 497 main at outside (Vertical)	3	12	14	16	12	14	12	13	6.4	4.3
Sunshade EF 545 GF outer (vertical)	2.13	16	14	12	16	14	12	14	7.2	3.6

Table 14: Ultrasonic Pulse Velocity Test at EF Quarters

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Slab EF - 167 kitchen (Indirect method) surface grinded	300	86	3.488	Medium
Slab EF - 167 kitchen (Indirect method) without surface grinded	300	70	4.285	Good
Slab EF - 167 kitchen (Indirect method) surface grinded	300	80	3.750	Medium
Slab EF- 164 kitchen (Indirect method)	300	87	3.448	Medium
Slab EF- 164 kitchen (Indirect method)	300	90	3.333	Medium
Slab EF 497 sunshade (Indirect method)	200	230	0.869	Doubtful
Slab EF 497 sunshade (Indirect method)	200	347	0.576	Doubtful

Table 15: Half-Cell Potential Test at EF Quarters

Location	Half cell potential (mv)						
Beam EF-298 GF	-490	-450	-560	-570	-446	-580	-480
Beam EF-299 First Floor	-502	-493	-482	-550	-475	-500	-472
Beam EF 82 -back side	-536	-510	-500	-523	-500	-532	-517
Lintel slab EF 38	-417	-438	-419	-455	-455	-447	-454
Sunshade EF -197 to 200 (outer GF)	-232	-354	-258	-254	-230	-246	-326
Beam EF-141 (Entrance)	-392	-310	-270	-242	-280	-346	-331
Sunshade EF - 165 (Front)	-270	-333	-306	-290	-305	-252	-299

Sunshade EF - 438 outer ground floor	-328	-411	-374	-400	-369	-321	-338
Slab EF -438 to 442 3 storey	-369	-428	-336	-429	-293	-324	-320
Slab EF 497 main at outside	-426	-391	-317	-392	-402	-451	-369
Sunshade EF 545 GF outer	-325	-350	-347	-450	-360	-354	-330

DS Type Quarters

These are recently renovated residential quarters. The improper roof treatment and waterlogging corroded the reinforcement. Along with the addition of concrete and cement mortar layer on the terrace level caused visible deflection and hence the cover concrete started to spall and reinforcement is exposed. Also, dampness has been observed even after roof treatment using cement mortar. Figure 21 shows the cracks and concrete spalling in renovated DS type roof slabs.

The NDT results (Table 16 – 18) show that the strength of concrete is degraded and the rebars are corroding (Table 18) has the HCP values are more negative than -350 mV.

Fig. 21: Spalling of cover concrete and dampness in a renovated building of DS type.

Table 16: Rebound Hammer Test at DS Quarters

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Compressive Strength (MPa)
Lintel DS- 2	2.1	14	14	14	0	14	16	12	-	-
Slab DS- 2 Vertical	3,0	32	40	34	38	36	36	36	37	24.7

Table 17: Ultrasonic Pulse Velocity Test at DS Quarters

Location	Distance (mm)	Time (μ sec)	Velocity (km/sec)	Quality of concrete
Slab DS-2 Indirect method	300	185	1.621	Doubtful
Slab DS-2 indirect method	300	118	2.542	Doubtful

Table 18: Half-Cell Potentiometer Test at DS Quarters

Location	Half cell potential (mV)						
Lintel DS- 2 (Back side)	-494	-457	-417	-327	-357	-367	-452
Slab DS- 2	-473	-453	-492	-492	-627	-444	-503

COMMUNITY CENTRE

The community centre has two parts of the structure. The front portion is RCC building, which comprises of G+1 structure. In the backside of the RCC structure, there is a big hall with a stage and GI sheets roof covering. The steel work in the roof is severely damaged and need to be replaced. The rainwater drains directly into the hall as shown in Figure 24 through the damaged roof. The steel truss is supported with RCC columns and there is a provision for the lobby at first-floor level. The floor area is severely affected by the ground settlement. It is also noted that the improper maintenance locked the drain system and the water logging at the first-floor lobby level severely affected the RCC elements. Also, vegetations were noticed around the structure as shown in Figure 25. The beams, columns and staircases are severely corroded as shown in Figure 26.

The Community Centre structure has columns of size of 620×320 mm, but the actual size of RC column is 600×200 mm and the 120 mm was provided by laying of bricks and plastering works (Figure 22). Stirrups spacing of column was 200 mm centre to centre. The NDT and carbonation tests were carried out on the columns. The result shows that the cover concrete of columns is carbonated. The staircases are extensively damaged due to also carbonation and subsequent corrosion of rebars. The enlarged dimensions of some of the columns shows that these columns were repaired and plastered earlier. Figure 23 shows that the condition of one of the columns in the community centre. As can be seen the rebars are in fully exposed condition without any cover.

Fig. 22. Damaged Column in the community center

Due to environmental effects the truss bolts connection are affected by corrosion. The purlins in the community centre are fully corroded due the atmosphere.

The rebound hammer test carried out at most of the areas the results indicate poor strength and some places are less than the minimum values (Table 19). The Ultrasonic pulse velocity test also conducted (Table 20). The Figure 23 show the spalling of cover concrete of column member and also showing the reinforcement in corroding stage.

Table 21 shows that the test carried out in the community centre to check the corrosion rate of reinforcements. This results shows the reinforcements are in corroding state. In the left corner of the beam of is highly corroded and directly visible by naked eye. Since the HCP values exceed -350 mV, the probability of corrosion is more than 90% according to ASTM C876.

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Fig. 23 Spalling of cover portion from Column

Fig. 24 Community Hall with damaged roof

Fig. 25 Vegetation at First Floor Level

Fig. 26: Cracks in Staircases, Beams, Stairs

Table 19: Rebound Hammer Test at Community Center

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Cube compressive strength (MPa)
Column 3 Ground floor	1.5	18	25	20	26	24	23	23	13.6	9.1
Beam Ground floor	2.1	32	24	22	20	23	24	24	14.8	9.9
Beam Ground floor	2.1	22	20	18	20	22	18	20	14.0	9.3
Column 1st floor (near left open stair case)	0.3	Less than rebound hammer value						-	-	-

Table 20: Ultrasonic Pulse Velocity Test at Community Centre

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Column 1 Ground floor (Direct method)	350	142	2.464	Doubtful
Column 2 Ground floor (Direct method)	350	114	3.070	Medium
Column 3 Ground floor (Direct method)	350	108	3.240	Medium
Beam 2 Ground floor inner (Direct method)	350	124	2.822	Doubtful
Slab Ground floor (Indirect method)	400	223	1.793	Doubtful
Slab First floor (Indirect method)	400	313	1.277	Doubtful
Column 1 1st floor (direct method)	350	95.1	3.680	Medium
Column 2 1st floor (direct method)	350	92	3.804	Medium

Table 21: Half-cell Potentiometer Test at Community Centre

Location	Half cell potential (mV)						
Column 1st floor (near left stair case)	-600	-605	-625	-700	-706	-830	-830
Stair case	-950	-970	More negative than -1 V				
Slab first floor	-505	-460	-488	-446	-510	-455	-505

(a) Exposed corroded reinforcement in Slab

(b) Dampness inside the Bank

(c) Portico beam corroded reinforcement

(d) Portico slab corroded reinforcement

Fig. 27: Damages in Bank Building

BANK BUILDING

This bank structure is a single storey building having a front portico and office space. The entire structure is severely corroded and therefore it is in an awfully distressed condition. The sunshade reinforcement, portico structure reinforcements are exposed as shown in Figure 27. The waterlogging at the terrace level shows dampness all across the building as shown in

Figure 27. Also, vegetations are also noticed due to improper maintenance. As it is a busy office space, a thorough NDT investigation and corrosion assessments mandatory and special remedial measures to be taken without hindering the bank routine works.

Inspection has been carried out of bank building. In this building beam contains 4 numbers of 25 mm diameter reinforcements and they are tied up with the help of 6 mm diameter stirrups.

Fig. 28. Dead Condition of stirrups in a beam

The higher deflection point has extra reinforcement with 2 numbers of 25 mm dia bars. If has been observed the stirrups of beam was totally in dead condition and at the same time it was not having any possibility of replacing the stirrups. The main reinforcement also corroded and it has 60% life. Most of the elements was heavily affected by the corrosion so there was high spalling of cover concrete. At few location cracking and spalling noticed upto core concrete (Figure 28).

The column reinforcement details are collected at the time of investigation which are, the 4 number of 25 mm rebars with 6 mm lateral ties. All main and stirrups are plain bars. Size of the column was noted at the time of investigation is 250 mm × 250 mm but the actual size of the column was 300 mm × 300 mm. The carbonated test was conducted on column which gives slightly higher result as the column was fully carbonated. Reinforcement which is embedded out of the top column was good, but reinforcement inside the concrete was fully corroded. The 6 mm stirrups were degraded into 3 mm due to the corrosion. 25 mm main reinforcement bars also converted into approximately 10 mm (Figure 29).

Fig. 29 Spalling and Cracking of Core concrete

In this building, Slabs also fully damaged due to the water stagnation problem and fully vegetated. At some location cover concrete is not there and reinforcements are fully visible. Slabs are contains reinforcement of 12 mm with 100 mm centre to centre. The soil sample was taken for the lab test.

Table 22: Rebound Hammer Test at Bank Building

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected compressive strength (MPa)
Column no 2 (horizontal)	0.7	20	20	18	16	20	17	19	8.8	5.9
Column no 3 (horizontal)	0.7	20	16	20	17	16	18	18	7.6	5.1
Column no 4 (horizontal)	0.7	18	20	17	18	20	18	19	8.8	5.9

Table 23 : Ultrasonic Pulse Velocity Test at Bank Building

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Column	250	205	1.219	Doubtful
Column	250	146	1.712	Doubtful

The NDT results (Table 22 – 24) indicate significant deterioration of the building structural elements and may not be safe for the functioning of bank.

Table 24: Half-Cell Potentiometer Test at Bank building

Location	Half cell potential (mV)						
Column 3	-390	-423	-378	-384	-395	-400	-383
Column 4	-680	-676	-655	-636	-647	-656	-671
Column 2	-647	-659	697	-628	-640	-635	-628

CISF BUILDING

The CISF building is a G+1 storey structure. The terrace is severely damaged and water penetration from the terrace can be seen from the roof slab. As a consequence, the cover concrete spalling at first-floor level is witnessed by the residents and reinforcements were exposed as shown in Fig. 30 & 31. Also, dampness is noticed due to stagnation of water as shown in Fig. 32. The exposed reinforcement at roof level and staircases were severely corroded and as a result of cracks and spalling was noticed. Also, the front arch-shaped portico is also severely affected by corrosion. The reinforcement bars are exposed and vegetation is noticed due to improper maintenance as shown in Figure 33.

Fig. 30: Corroded reinforcement in CISF building Stairs

Fig. 31: Exposed reinforcement in roof slab of CISF building

Fig. 32: Stagnated water on the terrace of CISF building

Fig. 33: Cracks, spalling of concrete and dampness in the portico of CISF building

The ground floor slab and lintel rebars are broken and plastered already. East facing building has more damages when compared to the North or West sides. The column have built by concrete and also facing has filled by brick column as an additional layer. Here, reinforced

concrete column has size of 350×350, 30 mm plastered and 320×350 mm was built by masonry column.

Fig. 34 Severely Corroded and discontinued reinforcement in slab

Fig. 35 Larger size aggregates in RC Beams.

On the first floor the cover concrete was totally spalled out and the steel reinforcement of slab is easily visible by normal eye (Figure 34 – 35). The slab has very closer spacing of main

reinforcement. The room and wall are fully moist with dampness. Roof has a major crack which was exactly above the beam and its own axis. The core sample was taken from the beam for carbonation test, and there was result shows that the beam was fully carbonated up to the core concrete of the beam. That beam has 50mm covers and 15mm plaster with 250 mm center to center distance of stirrup spacing. The concrete contains aggregate size of more than 30 mm. The 16 mm plain bars are used as main reinforcement.

Due to the effect of corrosion the 20 mm main rebars are degraded to 12 mm approximately. Beams have already 10 mm plasters and that again repaired with 55 mm of plaster. Due to the poor binding property between aggregate and cement paste which creates the high porous concrete. The presence of moisture causes smell and dampness. Few of the slab rebars are snapped due to corrosion (80%) of the bars.

These observations are confirmed by the NDT tests as can be seen in Table 25 – 27. The concrete has low strength while reinforcement is corroding.

Table 25: Rebound Hammer Test at CISF Building

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Cube compressive strength (MPa)
Column 4 East facing 1st floor	1.5	16	18	20	16	20	18	18	7.6	5.1
Beam 4 East facing 1st floor	3	15	10	15	12	10	15	13	-	-
Beam 1st Floor inside room no 36 (Quarter master store)	3	Less than rebound hammer value						-	-	-
Column GF barrack room no 8 opp (north facing)	1.5	22	23	24	20	25	22	23	13.6	9.1
Beam GF barrack room no 8 (north facing)	3	17	18	17	16	18	17	17	6.4	4.3
Beam GF barrack room no 8 (north facing)	3	18	17	18	16	17	18	17	6.4	4.3
Column 4 GF (WEST facing)	1.5	16	20	14	24	16	16	18	7.6	5.1

Table 26: Ultrasonic Pulse Velocity Test at CISF Building

Location	Distance (mm)	Time (µ sec)	Velocity (km/sec)	Quality of concrete
Column no 4 1st floor east facing (direct method)	350	429	0.815	Doubtful
Column no 4 1st floor east facing (Direct method)	350	256	1.367	Doubtful
Column no 4 1st floor east facing (Direct method)	350	254	1.377	Doubtful
beam 1st Floor inside room no 36 (Quarter master store) indirect method	400	538	0.743	Doubtful
Beam 1st Floor inside room no 36 (Quarter master store) indirect method	320	410	0.780	Doubtful
Beam 1st Floor inside room no 36 (Quarter master store) indirect method	320	542	0.590	Doubtful
Beam GF barrack room no 8 (Indirect method)	300	176	1.704	-
Beam GF barrack room no 8 (Indirect method)	400	743	0.538	Doubtful
Column 9 GF barrack room no 8 opp (North facing) direct method	380	151	2.516	Doubtful
Column 9 barrack room no 8 opp (North facing) direct method	380	156	2.435	Doubtful
Column 10 GF (North facing) direct method	380	132	2.878	Doubtful
Column 10 GF (North facing) direct method	380	131	2.889	Doubtful
Column 4 GF (West facing)direct method	380	141	2.695	Doubtful
Column 3 GF (West facing) direct method	380	126	3.015	Medium

Table 27: Half-cell Potentiometer at CISF Building

Location	Half cell potential (mV)						
Beam 4 East facing first floor bottom of beam	-620	-657	-648	-630	-640	-676	-732
Beam no 4 East facing first floor top bar of beam	-507	-692	-740	-761	-749	-666	-708
Beam inside room no 36 (Quarter master store)	-460	-455	-511	-535	-482	-540	-535
Beam barrack room no 8	-426	-420	-403	-414	-440	-411	-425

Officer hostel :

The columns have 60 mm plaster with 3 numbers of main reinforcement of 20 mm diameter with 6 mm stirrups at 150 mm center to center distance. The column was fully carbonated as the result got from carbonation test. The main rebars are in corroding stage while hitting by hammer pat with minor force cover, core and main reinforcement are fully crushed. Here the steel had lost it's behavior under the corrosion effect (Figure 36 – 37)

Fig. 36. Fully crushed condition of core and main bars

The core concrete was tested for carbonation test, two 100 mm core were kept and tested for the Carbonation test results was show 20 mm thick has carbonated from top thereafter the balance surface are good non-carbonated. This was confirmed by changing color into pink while spraying phenolphthalein. On first floor the main and distribution bars were fully is dead condition and entire lintel slab was fully damage.

Fig. 37 Damage due to corrosion in lintel and slab

The NDT carried out on building elements show some deterioration in the concrete (Table 28), while steel has more negative potential than -350 mV indicating active corrosion of steel rebars (Table 29).

Table 28: Rebound Hammer Test at Officer Hostel no.3

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected Compressive strength (MPa)
Column 8 1st Floor	1.2	20	24	20	20	20	24	21	11.2	7.5

Table 29: Half-cell Potentiometer Test at Officer Hostel no.3

Location	Half cell potential (mV)						
Beam Officers hostel no 3 2nd Floor (near sunshade slab)	-385	-398	-423	-425	-410	-453	-432

Shopping Complex

In the shopping complex, there are 8 columns at the front portion, which are in fully damaged condition and main reinforcement and stirrups can be easily visible by naked eye. The core was tested and the result shows that the concrete is fully carbonated. Due to the high content of sand in mix of concrete make look like a sandy color of columns. Table 30 – 32 show the NDT results indicating severe damage to the structure due to corrosion of rebars.

Fig. 38 Visible of main reinforcement in RC element

Fig. 39. Fully Collapsed in shopping complex

Table 30: Rebound Hammer Test at Shopping Complex

Location	Height (m)	Rebound hammer readings						Mean rebound number	Equivalent compressive strength (MPa)	Corrected compressive strength (MPa).
Column 2 GF	1.5	16	12	14	16	12	14	14	-	-
Column 1 GF	1.5	10	12	14	14	12	14	13	-	-
Column 3 GF	1.5	16	19	13	17	18	16	17	6.4	4.3

Table 31: Ultrasonic Pulse Velocity at Shopping Complex

Location	Distance (mm)	Time (μ sec)	Velocity (km/sec)	Quality of concrete
Column 3 GF	300	195	1.534	Medium
Column 3 GF	300	130	2.307	Medium

Table 32: Half-cell Potentiometer Test at Shopping Complex

Location	Half cell potential (mV)						
Column 2 GF	-250	-260	-244	-256	-264	-260	-250
Column 1 GF	-432	-335	-431	-371	-380	-350	-450

School buildings

The school buildings are having different independent masonry structure with asbestos sheet roofing. The steel frame to support asbeotos sheet is supported on the masonry wall and the corridor asbestos roof has been supported over masonry columns as shown in Figure 40. The class room interior has been facilitated with falls ceiling made of ply wood sheets and cloths. The internal steel frame used as a supporting element for fall ceiling is corroded and the fals ceilings are damaged severely as shown in Figure 41. The internal wall is full of dampness as shown in Figure 42 and cracked in many places. Differential floor settlements inside the class rooms were noticed as shown in Figure 41. The supporting wall members are having vertical splitting cracks in many locations as shown in Figure 42. The toilet facilities are unhygienic and insufficient for the students. Figure 43 shows a typical toilet block in the school premises. The reinforcements in sunshade slabs are corroded and plastered.

Fig. 40: Interior part of school

Fig. 41: Damaged fall ceilings in class rooms

(a) **(b)**

(c)

Fig. 42: Vertical cracks at various part of the wall

<table>
<tr><th colspan="3">SUMMARY OF THE RECOMMENDATIONS</th></tr>
<tr><th>S.No</th><th>Buildings</th><th>Recommendations</th></tr>
<tr><td>1</td><td>Community Centre</td><td>In view of the extensive repair and strengthening work required, it is recommended that the building should be demolished and replace it with a new one.</td></tr>
<tr><td>2</td><td>Bank Building</td><td>It is recommended to dismantle the entire structure and reconstruct with proper measures to avoid these problems in future.</td></tr>
<tr><td>3</td><td>Officer Hostel 1</td><td>In view of the extensive repair and strengthening work required, it is recommended that the building should be demolished</td></tr>
<tr><td>4</td><td>Officer Hostel 2</td><td>1. The residents of this structure to be vacated immediately.
2. It is recommended that the building structure should be demolished as extensive repair and strengthening work will be required.</td></tr>
<tr><td>5</td><td>EF Type Building</td><td>Weaker buildings can be dismantled and the moderate buildings can be strengthened and retained.
<table>
<tr><td>EF 1 to 8</td><td>Renovated in 2018</td><td rowspan="4">Total 252 Nos</td><td>To be retained</td></tr>
<tr><td>EF 89 to 204</td><td>Renovated in 2018</td><td>To be retained</td></tr>
<tr><td>EF 377 to 396</td><td>Renovated in 2018</td><td>To be retained</td></tr>
<tr><td>EF 437 to 544</td><td>Renovated in 2018</td><td>To be retained</td></tr>
<tr><td>EF 545 to 598</td><td>Renovated earlier</td><td>54 Nos</td><td>To be retained</td></tr>
<tr><td>EF 9 to 88</td><td colspan="2" rowspan="4"></td><td>To be dismantled</td></tr>
<tr><td>EF 401 to 436</td><td>To be dismantled</td></tr>
<tr><td>EF 605 to 622</td><td>To be dismantled</td></tr>
<tr><td>EF 635 to 664</td><td>To be dismantled</td></tr>
<tr><td>EF 205 to 376</td><td>Not renovated</td><td>171 Nos</td><td>To be dismantled</td></tr>
</table></td></tr>
<tr><td>6</td><td>CF Type Buildings</td><td>Additional strengthening measures to be carried out to avoid durability issues in future.</td></tr>
</table>

7	DS Type Buildings	1. Corrosion protective measures to be carried out for the slab to avoid severity of reinforcement corrosion. The additional dead load of roof slabs to be removed and a fresh water proofing layer to be done. 2. Vegetation growth to be removed from the root level and proper treatment to be done to avoid
8	CISF Building	1. It is recommended that the roof slabs and beams on the first floor to be dismantled and reconstructed. 2. The portico structure should be demolished and reconstructed. 3. The corroded reinforcements in the columns can be removed and replaced with new one during strengthening the column members.
9	Shopping Complex	1. It is recommend that the structure to be demolished.
10	D Type Buildings	1. In recently renovated D type buildings few building are identified as weak structures. 2. In order to retain those structures, strengthening measures to be taken to address the corrosion issues to meet the safety requirements.
11	F-Block Building (128 Nos)	1. All the residents of these buildings should be shifted immediately. 2. It is recommend that the building structures should be demolished. 3. Even though with this much damage, bricks are still in very good shape and can be used again for construction
12	ET Type Building (10 Nos)	1. All the residents of these buildings to be shifted immediately. 2. It is recommend that the structure to be demolished.
13	G Type Building (72 Nos)	1. All the residents of these buildings to be shifted immediately. 2. It is recommend that the building structures to be demolished.
14	HT Type Building (16 Nos)	1. All the residents of these buildings to be shifted immediately. 2. It is recommend that the building structures to be demolished.
15	School Building	As this building is quite old and non-framed semi pucca structure, it may be dismantled.

ANNEX-VI

CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 11/SM/2015

Coram:
Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member
Dr. M.K. Iyer, Member

Date of Order: 13.10.2015

In the matter of
Roadmap to operationalise Reserves in the country

ORDER

The Electricity Act, 2003 entrusts on the Central Commission important responsibilities inter-alia of regulating the inter-State transmission of electricity, specifying grid code and also enforcing standards with respect to quality, continuity and reliability of service by licensees. Laying down of framework for effective and secure grid operation is thus one of the most important mandates of the Commission. The Central Commission has taken initiatives towards this end through regulations on Indian Electricity Grid Code and Deviation Settlement Mechanism and related matters. The Commission has also issued direction from time to time for enforcing grid discipline.

2. Over the period, reliance of the utilities on the grid for meeting their short term energy demand was increasing. This caused serious threat to grid security. The Commission, therefore, tightened the operating band of grid frequency and made deviation charges stringent enough to discourage the utilities from deviation from their schedule. This has started yielding the desired results in terms of operation of the grid

closer to 50 Hz. The Commission has reiterated time and again that un-scheduled inter-change (UI) mechanism cannot be used as platform for meeting the energy demand of the utilities. Last mile imbalances are inevitable, but for this reliance on grid is not desirable. This need be planned for, and adequate reserves need be contracted to address such last mile imbalances.

3. The National Electricity Policy (NEP) mandates that adequate reserves may be maintained to ensure secure grid operation:

> "5.2.3 In order to fully meet both energy and peak demand by 2012, there is a need to create adequate reserve capacity margin. In addition to enhancing the overall availability of installed capacity to 85%, a spinning reserve of at least 5%, at national level, would need to be created to ensure grid security and quality and reliability of power supply."

4. However, creation of adequate system reserve margin and spinning reserves at national level has not yet materialised. In furtherance to the provisions relating to the requirement of Spinning Reserves in the Electricity Act, 2003, National Electricity Policy and Tariff Policy, and to facilitate-large scale integration of renewable energy sources, balancing, deviation settlement mechanism and associated issues, CERC constituted a Committee vide letter No. 25/1/2015/Reg. Aff. (SR)/CT.RC dated 29th May 2015, under the chairmanship of Shri A.S. Bakshi, Member CERC, to examine the technical and commercial issues in connection with Spinning Reserves and evolve suggested regulatory interventions in this context.

5. The Committee submitted its final report to the Commission on 17th September 2015 (annexed as Annexure-I). Major findings of the Committee are as under:

(a) Spinning Reserves are required to be maintained of requisite quantum depending upon the grid conditions. Operation at constant frequency target of 50.0 Hz with constant area interchange should be the philosophy adopted.

(b) The Spinning Reserve may be maintained, to start with at the regional level in a distributed manner.

(c) The respective RLDC should be the Nodal agency at the regional level and NLDC at the country level.

(d) Each region should maintain secondary reserves corresponding to the largest unit size in the region and tertiary reserves should be maintained in a de-centralized fashion by each state control area for at least 50% of the largest generating unit available in the state control area. This would mean secondary reserves of 1000 MW in Southern region; 800 MW in Western regions; 800 MW in Northern region; 660 MW in Eastern region and 363MW in North-Eastern region (total approx. 3600 MW on an All India basis). Primary reserves of 4000 MW should be maintained on an All India basis considering 4000 MW generation outage as a credible contingency. The same should be provided by generating units in line with the IEGC provisions.

(e) The reserve requirement may be estimated by the nodal agency on day-ahead basis along with day ahead scheduling of all available generating stations.

(f) Implementation of AGC is necessary along with reliable telemetry and communication. The AGC may be planned to be operationalised in the power system from 1.4.2017.

(g) It is essential that load forecasting is done at each DISCOM level, at each SLDC/State level and each RLDC/Regional level and finally at NLDC/country level.

(h) It is also essential to forecast the generation from renewable sources of energy by the generators, and similarly by the DISCOMs, by the SLDCs and by the RLDCs.

(i) To start with a regulated framework in line with the Ancillary Services Regulations may be evolved for identification and utilising of spinning reserves and implemented with effect from 1.4.2016. This framework may continue till 31.3.2017.

(j) The reserves at the regional level, should be assigned to specific identified generating station or stations duly considering the various technical and commercial considerations including energy charges of the generating stations. The nodal agency should be empowered to identify the ISGS irrespective of type and size of the generating station for providing spinning reserve services and it should be mandatory for such generating stations to provide spinning reserve services.

(k) The nodal agency may have the option of carrying such reserves on one or more plants on technical and commercial considerations and may withhold a part of declared capacity on such plants from scheduling. It could be in terms of % of declared capacity or in MW term as deemed fit.

(l) A framework as specified in the Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 may be followed for the Spinning Reserve Services as well. The Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 may be amended to incorporate the necessary changes in this regard.

(m) Going forward, a market based framework may be put in place from 1st April 2017 for achieving greater economy and efficiency in the system. A detailed study is required to be carried out before the market mechanism on spinning reserves is put in place. It is suggested that the NLDC be directed to commission study through a consultant in the context and submit a proposal to the Commission for approval.

The Commission has carefully considered and accepted the findings of the Committee.

6. One of the important components of ensuring grid reliability includes achieving adequacy of supply and maintaining the load-generation balance. This poses a challenge to grid operators on various time-scales: on a daily level as weather varies, for example, on an hourly level as load varies during the day, and on sub-hourly/time-

block level as there are errors in forecasting of load or unplanned outages of generating units or transmission lines. Sudden disturbances in the Power System can initiate a steep fall or rise in the frequency of the Power System, which can be detrimental to the Power System operation, if not contained immediately. Thus, to ensure 24x7 power supply and grid reliability, grid operators must have access to reserves at different locations and factoring transmission constraints, the system operators should be able to increase or decrease power supply on the grid at any time of the day.

7. Three types of reserves are generally considered depending on the timeline of initiation and functional need. Primary control refers to local automatic control available in all conventional generators, which delivers reserve power negatively proportional to frequency change. Such immediate automatic control is implemented through turbine speed governors, in which the generating units respond quickly to the frequency deviation as per droop characteristic of the units. However, this response to arrest frequency drop or rise lasts for short period of up to 30 seconds - 15 minutes, within which secondary control should come into play should the contingency last longer than that. IEGC section 5.2(i) specifies a provision for primary reserves, as under:

> "The recommended rate for changing the governor setting, i.e., supplementary control for increasing or decreasing the output (generation level) for all generating units, irrespective of their type and size, would be one (1.0) per cent per minute or as per manufacturer's limits. However, if frequency falls below 49.7Hz, all partly loaded generating units shall pick up additional load at a faster rate, according to their capability."

However, this has not been adhered to fully by the generators.

8. Secondary control involves Automatic Generation Control (AGC) which delivers reserve power in order to bring back the frequency and the area interchange programs to their target values. For AGC, units as well as load dispatch centres have to be equipped with necessary communication infrastructure, as it involves sending automated control signals from the LDC to the generator based on grid conditions. AGC has been absent in the Indian power system. Very commonly, this results in 'load shedding' by DISCOMs in case generation is lagging load. The Indian power sector was beset with scarcity for a long time; however, now the scenario is changing and margin for reserves is feasible. With a large interconnected grid meeting a peak load of over 145 GW, both primary and secondary controls are essential components for reliable grid operation.

9. Tertiary control refers to manual change in the dispatching and unit commitment in order to restore the secondary control reserve, as loss of generator may cause a system contingency that lasts for several hours.

10. Traditionally, imbalance handling on the Indian grid has been done through the Unscheduled Interchange (UI) or the Deviation Settlement Mechanism (DSM) framework, in which the frequency-linked UI rate gave a signal to the grid participants to correct for instantaneous frequency deviations. However, it led to use not meant for, and further grid indiscipline besides stress/constraints in the transmission network. While measures like tightening of the operating grid frequency band and provision for deterrent deviation charges, have been resorted to and this has resulted in improvement of grid operation, the Commission feels that the power system operation in

the country still needs to mature further. Even now States have been deviating from schedule substantially. For instance, in 2014-15, Rajasthan deviated in the range of (+) 1202 to (-) 1324; UP in the range of 1613 to (-) 2291; Karnataka in the range of 945 to (-) 787 etc.; Tamil Nadu in the range of 546 to (-) 990; Gujarat in the range of 1174 to (-) 1162. These are not only undesirable but also a cause of serious concern. The DSM Regulations provide for a periodic review of the DSM rates and the Commission directs the Staff to undertake a review of the same and submit a proposal for consideration of the Commission.

11. The Commission would like to underscore that grid does not generate electricity and as such cannot be relied upon for meeting energy needs. Reserves and reserves alone can address this and the earlier the stakeholders realise this, the better it is for safe and secure system operation. Reserves assume greater significance additionally in the wake of the goal of integration of large scale variable renewable energy sources. With increasing penetration of variable and intermittent RE generation, flexible generation such as pumped storage hydro plants are needed. There is a need for more flexibility in the operation of conventional generation plants also and flexibility needs to be quantified, measured and duly compensated for. The Commission has already made a beginning in this direction by proposing amendment to the Indian Electricity Grid Code (IEGC) in respect of 'technical minimum' which is expected to be notified shortly. 'Ramp up' and 'ramp down' rates are other important parameters for flexibility which would gradually be introduced through Regulations.

12. The grid operator would now be required to undertake planning exercise to meet Net Load, which is defined as: Net load = Load – RE power. This quantum must be met with conventional generation with adequate flexibility at every point in time. To even begin an exercise of planning for ongoing load-generation balance, load forecasting is essential. It is also necessary to ensure conventional generators to generate as per the schedules. Forecasting and scheduling of solar and wind generating stations is the next critical step for the grid operators to estimate the amount of RE power they can anticipate to be injected into the grid, on a day-ahead and hour-ahead basis. Thus, the variability that can be predicted in the forecasts must be accounted for in planning flexible generation as well as tertiary reserves day-ahead and hour-ahead. Furthermore, balancing the uncertainty of RE power on a continuous basis necessitates a streamlined process for deploying spinning reserves. This would be effectively balancing the forecasting error in net load.

13. The Commission notified Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 on 19th August 2015 with the objective of utilizing un-requisitioned surplus in ISGS. These regulations are a first step towards the entire gamut of Ancillary Services, starting with tertiary frequency control services. Applicable to regional entities, the regulations outline a framework for both Regulation Up and Regulation Down service by Reserves Regulation Ancillary Services (RRAS) providers. NLDC along with RLDC, operating as the nodal agency, shall call for these services in varying situations, such as extreme weather events, loss of generating unit

or transmission line outage, load-generation imbalance, etc. The RRAS providers shall be paid from the Regional DSM Pools.

14. Furthermore, the Commission notified the Order on Extended Market Session on Power Exchanges on 8th April, 2015, and the power exchanges started operating extended hours for intra-day products by end of July. The trading window is now open round-the-clock for delivery of power on the same day, with a 3-hour delivery time-frame. This can enable to significantly correct for intra-day imbalances in a proactive manner, and not passively rely on the grid for the same. It is expected that the Distribution Control Centres (DCCs) of DISCOMs also operate in a 24 x 7 manner to reap the advantages from these extended market sessions. Depending on the market needs, there is a need for newer products in the electricity market to provide more opportunities to the participants to balance their portfolio. The Commission directs the staff to examine this aspect of market design and submit a proposal for consideration of the Commission.

15. It is also expected that with provision for reserves and harnessing the same through 'controls', the inter area power flows would be manageable and help in optimizing the Transmission Reliability Margin (TRM). This would benefit all stakeholders to a great extent.

16. In due recognition of the above factors, the Commission would like to chart out a road map for introduction of reserves in the country. Accordingly, the Commission directs as under:

(a) For reliable and secure grid operation, to maintain continuous load-generation balance, to counter generation outages as well as unexpected load surges or crashes, and for large scale integration of variable renewable power, it is essential for the grid operators to have access to distributed Spinning Reserves which are dispatched taking due care of transmission constraints whenever required.

(b) The Commission reiterates the need for mandating Primary Reserves as well as Automatic Generation Control (AGC) for enabling Secondary Reserves.

(i) All generating stations that are regional entities must plan to operationalise AGC along with reliable telemetry and communication by 1st April, 2017. This would entail a one-time expense for the generators to install requisite software and firmware, which could be compensated for. Communication infrastructure must be planned by the CTU and developed in parallel, in a cost-effective manner.

(ii) On the other hand, National/Regional/State Load Dispatch Centres (NLDC/RLDCs/SLDCs) would need technical upgrades as well as operational procedures to be able to send automated signals to these generators. NLDC /RLDCs and SLDCs should plan to be ready with requisite software and procedures by the same date.

(iii) The Central Commission advises the State Commissions to issue orders for intra-state generators in line with this timeline as AGC is essential for reliable operation of India's large inter-connected grid.

(c) To start with, a regulated framework in line with the Ancillary Services Regulations would need be evolved for identification and utilising of spinning reserves and implemented with effect from 1st April, 2016. This framework may continue till 31st March, 2017. This may only include generating stations regulated by CERC, which could be started off with a manual process for secondary reserves. The NLDC/POSOCO is directed to submit a detailed procedure in this regard for approval by the Commission within one month from the issue of this Order. The amendments required in various Regulations issued by the Commission would also need to be indicated. As the Renewable Energy (RE) penetration levels increase in the coming years, the impact on the quantum of reserves would need to be separately studied and provided for through further amendments.

(d) In the long term, however, a market based framework is required for efficient provision of secondary reserves from all generators across the country. For this, NLDC/POSOCO is directed to commission a detailed study through a consultant and suggest a proposal to the Commission for implementation by 1st April, 2017, giving due consideration to the experience gained in the implementation of Spinning Reserves w.e.f. 1st April, 2016.

(e) The States must undertake separate scheduling and energy accounting of all generating and load entities. Deployment of DSM framework shall greatly prepare the State to differentiate between and attribute deviations caused due to various entities involved. Recording of this data shall also give the State grid operator much needed clarity on which entities are responsible for schedule deviations, and to what extent.

(f) Load forecasting must be undertaken by all DISCOMs. Combined with DSM, it is the foundation on which strong and reliable grid management can be built.

(g) In order to ensure reliable and secure operation of the grid, in addition to compliance to standards and regulations, adequate defense mechanisms such as Under Frequency Relays (UFRs), df/dt (rate of change of frequency), System Protection Schemes (SPS), etc. must be put in place and which also need to be periodically reviewed and checked for healthiness.

17. The petition is disposed of in terms of the above directions.

sd/-	sd/-	sd/-	sd/-
(Dr. M.K. Iyer)	**(A. S. Bakshi)**	**(A.K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Member**	**Chairperson**

केन्द्रीय विद्युत विनियामक आयोग
CENTRAL ELECTRICITY REGULATORY COMMISSION

नई दिल्ली
NEW DELHI

याचिका संख्या. /Petition No.: 319/RC/2018

कोरम/Coram:

श्री पी. के. पुजारी, अध्यक्ष/Shri P. K. Pujari, Chairperson
डॉ. एम. के. अय्यर, सदस्य/ Dr. M.K. Iyer, Member
श्री आई. एस. झा, सदस्य/ Sh. I.S. Jha, Member

आदेश दिनांक /Date of Order: 28th of August, 2019

IN THE MATTER OF

Automatic Generation Control (AGC) implementation in India

AND

IN THE MATTER OF

National Load Despatch Centre
Power System Operation Corporation Ltd.
(A Government of India Enterprise) B-9,
Qutab Institutional Area, Katwaria Sarai
New Delhi-110016

…Petitioner

VERSUS

1. NTPC Limited,
   Plot No A-8A,
   Sector-24, Noida,
   Uttar Pradesh, India- 201301

2. NHPC Limited,
   N.H.P.C Office Complex,
   Sector-33, Faridabad – 121003, Haryana

3. Central Transmission Utility,
   Saudamini, Plot No. 2,
   Sector-29, Gurgaon-122 001 (Haryana)

4. SJVN, Shakti Sadan,
   SJVN Corporate Office Complex, Shanan-171006

5. THDC INDIA LIMITED, Corporate Office,
   Rishikesh, Pragatipuram, By Pass Road,
   Rishikesh – 249201, Uttrakhand

6. Aravali Power Company Private Ltd.,
   Indira Gandhi Super Thermal Power Station (IGSTPS),
   Jharli, District Jhajjar, Haryana-124141

7. N T E C L Vallur Thermal Power Project,
   P.O.: Vellivoyal Chavadi,
   Ponneri Taluk, Tiruvallur Dist, Chennai- 600 103

8. NLC India Limited,
   Block - 1, Neyveli - 607 801,
   Cuddalore District, Tamilnadu

9. NTPC-SAIL Power Company Limited –
   Corporate Centre, 4th Floor, Nbcc Tower,
   15 Bhikaiji Cama Place, New Delhi, Delhi – 110066

10. Coastal Gujarat Power Ltd,
    Tata Power Co. Ltd., Backbay Rec Station,
    148, Lt. Gen. J.Bhonsle Marg,
    Nariman Point, Mumbai 400 021

11. Sasan Power Limited,
    Reliance Centre, Near Prabhat Colony,
    Off Western Express Highway,
    Santacruz East, Mumbai – 400055, Mumbai

12. Ratnagiri Gas and Power Pvt. Ltd.,
    Registered Office, NTPC Bhawan,
    Core-7, SCOPE Complex,
    7, Institutional Area, Lodi Road,
    New Delhi-110003, India

13. North Eastern Electric Power Corporation Ltd,
    Brookland Compound, Lower New Colony,
    Shillong-793003, Meghalaya, India.

14. ONGC Tripura Power Company Ltd.
    6th Floor, A Wing, IFCI Towers, 61,
    Nehru Place, New Delhi – 110019

15. Bharatiya Rail Bijlee Company Ltd.
    Nabinagar,Khera Police Station
    Dist.-Aurangabad, Bihar-824303

Northern Region

16. Delhi Transco Limited,
    33kV, Sub Station Building,
    Minto Road, New Delhi -110002.

17. Haryana Vidyut Prasaran Nigam Limited,
    XEN/LD & PC, SLDC Complex,
    Sewah Panipat -132103.

18. Himachal Pradesh State Electricity Board,
    HP Load Despatch Society,
    SLDC complex, Totu,
    Shimla -171011.

19. Jammu & Kashmir Power Development Department,
    SLDC Building,
    220 kV Grid Station Narwal,
    Jammu -180007.

20. Punjab State Transmission Corporation Limited,
    Ablowal, Patiala, SLDC Building,
    Near 220KV Grid Substation,
    PSTCL, Ablowal,
    Patiala -147001

21. Rajasthan Rajya Vidyut Prasaran Nigam Limited,
    State Load Despatch Centre,
    Rajasthan Rajya Vidyut Prasaran Nigam Limited,
    Ajmer Road, Heerapura,
    Jaipur -302024

22. Uttar Pradesh Power Transmission Corporation Limited,
    Power System,5th Floor,
    Shakti Bhawan,14 Ashok Marg,
    Lucknow -226001

23. Power Transmission Corporation of Uttarakhand Limited,
    400 KV Substation,
    Veerbhadra, Rishikesh -249202

24. General Manager,
Singrauli Super Thermal Power Station,
Shakti Nagar, UP-231222

25. General Manager,
Singrauli Solar PV Power Project,
Shakti Nagar, UP-231222

26. General Manager,
Singrauli Small Hydro Power Project,
Shakti Nagar, UP-231222

27. General Manager,
Rihand Super Thermal Power Station-I,
Rihand Nagar, UP-231223

28. General Manager,
Rihand Super Thermal Power Station-II,
Rihand Nagar, UP-231223

29. General Manager,
Rihand Super Thermal Power Station-III,
NTPC Rihand, Dist-Sonbhadra,
UP - 231223

30. General Manager,
Dadri, National Capital Power Project,
Dadri Dhaulana Road,
Distt. Gautam Buddh Nagar,
UP-201008

31. General Manager,
Dadri – Stage - II,
National Capital Power Project,
Dadri Dhaulana Road,
Distt. Gautam Buddh Nagar,
UP-201008

32. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-I,
Unchahar, Distt. Rai bareilly,
UP

33. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-II,
Unchahar, Distt. Raibareilly,
UP

34. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-III,
Unchahar, Distt. Raibareilly,
UP

35. General Manager,
Firoz Gandhi Unchahar Thermal Power Project-IV,
P.O. Unchahar, Dist. : Raibareilly (U.P.) Pin-229406

36. General Manager,
Firoz Gandhi Unchahar Solar PV Power Project,
Unchahar, Distt. Raibareilly, UP

37. General Manager,
Dadri Gas Power Project,
Dhaulana Road, Distt.
Gautam Buddh Nagar,
UP-201008

38. General Manager,
Dadri Solar PV Power Project,
Dhaulana Road, Distt.
Gautam Buddh Nagar,
UP-201008

39. General Manager,
Auraiya Gas Power Project(Gas Fired, RLNG Fired, Liquid Fired),
Dibiyapur, Distt Etawah,
UP-206244

40. General Manager,
Anta Gas Power Project (Gas Fired, RLNG Fired, Liquid Fired),
Distt. Baran,
Rajasthan-325209

41. General Manager, Koldam HPP, NTPC,
Post- Barman, Dist- Bilaspur,
Himachal Pradesh 174013

42. Station Director,
Narora Atomic Power Station,
Narora, Distt. Bulandshahar,
UP-202389

43. Station Director,
Rajasthan Atomic Power Station-B,
Anu Shakti Vihar, Kota,
Rajasthan-323303

44. Station Director,
Rajasthan Atomic Power Station-C, (RAPS-5&6)
PO-Anushakti, Kota,
Rajasthan-323304

45. General Manager,
Bairasiul Hydro Electric Project,
NHPC Ltd., Surangini,
Distt. Chamba, HP-176317

46. General Manager,
Salal Hydro Electric Project,
NHPC Ltd,
Jyotipuram, Distt. Udhampur,
J&K-182312

47. General Manager,
Tanakpur Hydro Electric Project,
NHPC Ltd.,
Banbassa, Distt. Champawa,
Uttrakhand-262310

48. General Manager,
Chamera-I Hydro Electric Project,
NHPC Ltd.,
Khairi, Distt.
Chamba, HP-176310

49. General Manager,
Uri Hydro Electric Project,
NHPC Ltd.,
Mohra, Distt. Baramulla,
J&K-193122

50. General Manager,
Chamera-II Hydro Electric Project,
NHPC Ltd.,
Karian, Distt. Chamba,
HP-176310

51. General Manager,
Chamera-III Hydro Electric Project,
NHPC Ltd., Dharwala, Distt.- Chamba,
HP-176311

52. General Manager,
Dhauliganga Hydro Electric Project,
NHPC Ltd., Tapovan, Dharchula, Pithoragarh,
Uttrakhand-262545

53. General Manager,
Dulhasti Hydro Electric Project,
NHPC Ltd.,
Chenab Nagar, Distt. Kishtwar,
J&K-182206

54. General Manager,
Uri 2 Hydro Electric Project, NHPC Ltd.,
Nowpura, Distt. Baramulla, J&K-193123

55. General Manager,
Parbati HE Project Stage-III Behali,
P.O- Larji Kullu 175122 Himachal Pradesh

56. Chief Engineer,
Sewa-II Power Station,
NHPC Ltd. Mashke, post Bag no-2,
P.O-Khari, Dist: Kathua, Jammu and Kasmir -176325

57. The Chief Engineer (Electrical),
Kishanganga HEP,
Office cum Residential colony, Kralpora,
Distt: Bandipora, Jammu and Kashmir-193502

58. Chief Engineer (Elect.),
Parbati-II HEP, Electrical & Mechanical complex,
Sainj, Distt. Kullu, Himachal Pradesh -175134

59. General Manager,
Naptha Jhakhri HEP,
Satluj Jal Vidyut Nigam Ltd. Power Project,
Jhakri, Rampur, Distt. Shimla, HP-172201

60. General Manager,
Rampur HEP,
Satluj Jal Vidyut Nigam Ltd. Power Project,
Jhakri, Rampur, Distt. Shimla, HP-172201

61. General Manager,
Tehri Hydro Development Corporation Ltd.,
Pragatipuram, Rishikesh,
Uttrakhand-249201

62. General Manager,
Koteshwar HEP, THDCIL, Koteshwerpuram,
Post Office- Pokhari Tehri Garwal, Uttarakhand - 249146

63. Director (Power Regulation),
Bhakra Power House, SLDC Complex,
66 KV Substation, Industrial Area Phase-I,
Madhya Marg, BBMB Chandigarh

64. General Manager, ADHPL,
Village- Prini, PO -Jagat Sukh,
Tehsil - Manali, Distt- Kullu (H.P) India.

65. General Manager,
Indra Gandhi Super Tharmal Power Project,
PO -Jharli, Tahsil Matanhail, Dist – Jhajjar, (Haryana)-124125

66. General Manager,
Karcham Wangtoo HEP,
Himachal Baspa Power Company Limited,
Sholtu Colony, PO- Tapti, Dist-Kinnaur, -172104 (HP)

67. Director,
Malana - II Everest Power Pvt. Ltd,
Hall-A/ First Floor Plot No-143-144,
Udyog Vihar, Phase -4, Gurgaon, Haryana 122015

68. Company Secretary,
Shree Cement Thermal Power Project Bangurnagar,
Beawar , Dist Ajmer, Rajasthan -305901

69. Company Secretary,
Greenco Budhil HPS Ltd,
Plot No. 1367 Road No- 45,
Jubilee Hills, Hyderabad- 500033

70. Project General Manager,
Himachal Sorang Power Limited, D-7,
Lane-I, Sector-I, New Shimla, Shimla, H.P.-171009.

71. General Manager,
Sainj HEP, HPPCL, Larji,
Distric - Kullu, Himachal Pradesh, 175122

Western Region

72. MSLDC,
Airoli, Navi Mumbai, Airoli,
Thane - Belapur Road, Navi Mumbai-400708.

73. State Load Despatch Centre,
MPPTCL, Jabalpur,
O/o Chief Engineer (SLDC), MPPTCL, Nayagaon, Jabalpur

74. SLDC Gotri Vadodara,
Gujarat, 132kV Gotri s/s compound,
Opposite Kalpvrux Complex,
Gotri Road,
Vadodara

75. Chhattisgarh State Load Despatch Centre,
C.E(LD), State Load Despatch Centre,
CSPTCL, Daganiya-HQ,
Raipur, Chhattisgarh

76. General Manager, Korba STPS STG (I& II),
National Thermal Power Corporation,
P.O. Vikas Bhavan, Jamnipali,
Korba(Distt.),
Chhattisgarh- 495 450.

77. General Manager,
Korba STPS STG (III),
National Thermal Power Corporation,
P.O. Vikas Bhavan, Jamnipali,
Korba(Dist),
Chhattisgarh- 495 450.

78. General Manager,
STAGE-I, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885

79. General Manager,
STAGE-II, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885

80. General Manager,
STAGE-III, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhyanagar, Sidhi(Dist),
Madhya Pradesh – 486 885

81. General Manager,
STAGE-IV, Vindhyachal STPS,
National Thermal Power Corporation of India Ltd,
P.O Vindhynagar, Sidhi(Distt.),
Madhya Pradesh – 486 885

82. General Manager,
Kawas Gas Power Project,
National Thermal Power Corporation of India Ltd,
P.O. Aditya Nagar,
Surat- 394 516

83. General Manager,
Gandhar Gas Power Project,
National Thermal Power Corporation of India Ltd,
P.O. NTPC Township, Bharuch(Distt.),
Gujarat- 392 215

84. General Manager,
SIPAT TPS Stg-I,
National Thermal Power Corporation of India Ltd,
SIPAT, Chhattisgarh.

85. General Manager,
SIPAT TPS Stg-II,
National Thermal Power Corporation of India Ltd,
SIPAT, Chhattisgarh.

86. General Manager,
Mouda STPP,
NTPC Ltd,
Mouda Ramtek Road,
P.O.Mouda, Nagpur (Dist),
Maharashtra

87. General Manager ,
2 X 135 MW Kasaipali Thermal Power Project,
ACB (India) Ltd.
District - Korba
Chhattisgarh Chakabura 495445

88. General Manager,
Bharat Aluminium Co. Ltd,
Captive Power plant-II,
BALCO Nagar Chhattisgarh, Korba 495 684

89. Executive Director,
Costal Gujarat Power Ltd,
Tunda Vandh Road, Tunda Village, Mundra,
Gujarat Kutch 370435

90. Executive Director,
DB Power,
Village - Baradarha, Post - Kanwali,
Dist - Janjgir, Champa, Chhattisgarh Baradarha 495695

91. Executive Director,
Jindal Power Ltd. Stg-I,
OP Jindal STPP, PO-Tamnar,
Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107

92. Executive Director,
Jindal Power Ltd. Stg-II,
OP Jindal STPP,
PO-Tamnar,
Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107

93. Executive Director,
Plot No Z-9,
Dahej SEZ Area (Eastern side),
Dahej, Taluka-Vagra, Gujarat Dist-Bharuch, 392130

94. Executive Director,
EMCO Power Ltd,
Plot No B-1, Mohabala MIDC Growth Center
Post Tehsil - Warora, Dist Chandrapur-Maharashtra 442907

95. Executive Director,
ESSAR POWER MP LTD.
Village Bandhora,
Post Karsualal, Tehsil Mada,
Distt. Singrauli, Madhya Pradesh-486886

96. General Manager,
GMR CHHATTISGARH ENERGY LTD
Skip House, 25/1, Museum Road
Karnataka Banglore 560025

97. Managing Director,
Jaypee Nigri Super Thermal Power Project,
Nigri District, Madhya Pradesh
Singrauli 486668

98. Executive Director,
DCPP, OP Jindal STPP,
PO-Tamnar, Gjarghoda Tehsil,
Chhattisgarh District - Raigarh, 496107

99. Station Director,
Nuclear Power Corporation of India ltd,
Kakrapara Atomic Power Station,
PO - via Vyara, Gujarat Dist - Surat 395651

100. Station Director,
Tarapur Atomic Power Station 1&2,
Nuclear Power Corporation of India Ltd,
P.O. TAPP, Thane(Dist),
Maharashtra- 401 504

101. Station Director,
Tarapur Atomic Power Station 3&4,
Nuclear Power Corporation of India Ltd,
P.O. TAPP, Thane (Distt.),
Maharashtra- 401 504

102. Managing Director,
Korba West Power Co. Ltd.,
Village – Chhote Bhandar,
P.O. - Bade Bhnadar,
Tehsil - Pussore,
District - Raigarh,
Chhattisgarh Raigarh 496100

103. Managing Director,
KSK Mahanadhi,
8-2-293/82/A/431/A, Road No 22 Jubilee Hills
Andhra Pradesh Hyderabad 500033

104. General Manager,
LANCO Power Ltd,
Plot No - 397, Phase -III, Udyog Vihar, Haryana
Gurgaon 122016

105. General Manager,
NTPC-SAIL Power Company Private Ltd,
Puranena Village, Chhattisgarh Dist - Durg,
Bhilai 490021

106. General Manager,
Ratnagiri Gas & Power Pvt Ltd,
2nd Floor, Block-2, IGL Complex,
Sector-126, Expressway, Uttar Pradesh
Noida 201304

107. Managing Director,
Sasan Power Ltd,
DAKC, I Block, 2nd Floor, North Wing,
Thane Belapur Road, Koparkhairana Maharashtra
New Mumbai 400710

108. Managing Director,
Vandana Vidyut Bhavan,
M. G. Road
Chhattisgarh Raipur 492001

109. Managing Director,
RAPP Transmission Company Limited,
Mira Corporate Suites,
1&2 Ishwar Nagar,
Okhla crossing,
Mathura road,
New Delhi, 110065

110. General Manager,
LARA,
National Thermal Power Corporation of India Ltd,
Chappora, PO-Pussora,
Raigarh, Chhattisgarh.

111. General Manager,
Solapur,
National Thermal Power Corporation of India Ltd,
Western Region HQ,
Samruddhi Venture Park,
2nd Floor, MIDC Marol,
Andheri East, Mumbai,
Maharashtra.

Eastern Region

112. State Load Despatch Center,
GRIDCO Colony
PO-Mancheswar Railway Colony,
BBSR Bhubaneshwar -751070

113. State Load Despatch Center,
Jharkhand State Electricity Board (JSEB)
Kushai Colony, Doranda,
Ranchi-834002

114. SLDC-BSEB,
Patna, Bihar State Electricity Board,
Vidyut Bhawan, Jawaharlal Nehru Marg,
Patna-800021

115. SLDC-W.Bengal,
P.O. Danesh Seikh Lane,
Andul Road
Howrah – 711109

116. Damodar Valley Corporation,
DVC Tower,
VIP Road, Kolkata,
WB 700054

117. Energy and Power Deptt.,
Govt. of Sikkim
Kazi Road,
Gangtok 737 201

118. General Manager,
Farakka Super Thermal Power Plant-I&II,
NTPC Ltd.,
Farakka, WB 742236

119. General Manager,
Farakka Super Thermal Power Plant-III,
NTPC Ltd.,
Farakka, WB 742236

120. General Manager,
Kahalgaon Super Thermal Power Plant-I NTPC Ltd,
Bhagalpur Bihar 813214

121. General Manager,
Kahalgaon Super Thermal Power Plant-II NTPC Ltd,
Bhagalpur Bihar 813214

122. Executive Director,
Talcher Super Thermal Power Stn-I NTPC Ltd,
Nayapalli, Odisha 751012

123. Addl. General Manager,
National Thermal Power Corporation Limited,
BARH Thermal Power Station, Patna, Bihar 803213

124. GM(O&M),
Kanti Bijlee Utpadan Nigam Limited
Muzaffarpur Thermal Power Station Bihar Muzaffarpur 843130.

125. The General Manager(O&M),
Bharatiya Rail Bijlee Company Ltd.
Nabinagar,Khera Police Station Dist.-Aurangabad, Bihar-824303

126. General Manager (O&M),
Darlipali Super Thermal Power Project NTPC Ltd.
Odisha Darlipali,Sundergarh 770072.(upcoming)

127. Chairman, Damodar Valley Corporation
DVC Tower, VIP Road West Bengal Kolkata 700054
(Not an ISGS but have many generating units)

128. Chief Engineer (Elect),
Teesta V HEP,
NHPC,
Singtam, East Sikkim 737134

129. Chief Engineer,
Rangit Hydro Electric Project NHPC,
P.O. Rangit Nagar
South Sikkim 737111

130. CEO,
Maithon Power Limited
MA-5 Gogna Colony,
P.O: Maithon, Dhanbad,
Jharkhand 828027

131. DGM (Electrical), Adhunik Power & Natural Resource Limited
Village: Padampur, PS: Kandra Tata-Seraikela Road,
Jharkhand 832105

132. GM (Power Sales & Regulatory),
GMR Kamalanga Energy Ltd,
Plot No.-29, Satyanagar,
Bhubaneswar, Odissa-751007

133. Head Power & Sales,
Jindal India Thermal Power Ltd.,
Plot No.12,Local Shopping Complex,
Sector-B1,Vasant Kunj, New Delhi- 110070

134. Advisor(Power),
Ind-Barath Energy Utkal Ltd ,
Sahajbahal, PO CgarpaliBarpali,
Dist - Jharsuguda, Odisha , Pin – 768211

135. GM(C & RA),
Odisha Power Generation Corporation Ltd.,
Zone-A, 7th Floor, Fortuna Towers,
Chandrashekharpur, Odisha Bhubanneswar 751023. (Upcoming)

136. Sr.Vice President(O&M),
Teesta Urja Ltd.(Teesta -III HEP)
Vijaya Building, 2nd Floor, 17 Barakhamba Road
New Delhi New Delhi 110001

137. Asst. General Manager ,
DANS ENERGY PVT. LTD.
5th Floor, DLF Building No. 8,
Tower C, DLF Cyber City, Phase – II,
Gurgaon- 122002, Haryana

138. Chairman,
GATI Infrastructure Ltd,
268, UdyogVihar,
Phase-IV, Gurgaon,
Haryana 122001

139. President –Technical,
Shiga Energy Private Ltd.
5th Floor, DLF Building No.8,
Tower C, Phase-II, Haryana Gurgaon 122002

140. VP (Commercial),
Sneha Kinetic Power Project Private Ltd
1366, Road no. 45, Jubilee Hills
Telangana Hyderabad 500033

Southern Region

141. Andhra Pradesh State Load Dispatch Centre,
Room No. 611, 6th Floor, A Block APTRANSCO,
Vidyut Soudha, Khairatabad

142. State Load Despatch Centre,
KPTCL, 28, Race course Cross Road,
Bangalore -560009

143. State Load Despatch Centre, Kalamassery,
Executive Engineer O/o Chief Engineer, (Transmission),
System Operation, Kalamassery-683503

144. System Control Centre,
Electricity Department, Puducherry,
137, Nethaji Subhash Chandra Bose Salai,
Electricity Department-605001

145. TANTRANSCO, SLDC, MLDC
Block, 144 Anna Salai, Chennai-600002

146. Telangana SLDC, Chief Engineer,
Room No 611 A Block,
SLDC of the State of Telangana (TSSLDC),
TSTRANSCO, Vidyut Soudha,
Khairtabad, Hyderabad-500082

147. General Manager,
National Thermal Power Corporation Ltd.,
SR Headquarters II & V Floors,
MCH Complex,
R.P. Road, Secunderabad-500 003,

148. General Manager,
National Thermal Power Corporation Ltd.,
SR Headquarters II & V Floors,
MCH Complex,
R.P.Road, Secunderabad-500 003,

149. General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O. Neyveli, PIN: 607 801,
Cuddalore Distt., Tamil Nadu State.

150. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O. Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.

151. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O.Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.

152. The Deputy General Manager,
Neyveli Lignite Corporation Ltd.,
Corporate Office, Block-01,
P.O.Neyveli, PIN: 607 801,
Cuddalore Dist., Tamil Nadu State.

153. The Station Director,
Madras Atomic Power Station,
Nuclear Power Corpn. Of India Ltd.,
Kalpakkam – 603 102, Tamil Nadu State

154. The Deputy General Manager,
Kaiga Generating Station,
Nuclear Power Corpn. of India Ltd.,
P.O.Kaiga, Via Karwar,
Karnataka - 581400 , Karnataka State.

155. The Station Director,
Kudankulam Nuclear Power Project, Unit -1
Nuclear Power Corporation of India Ltd.,
P.O. Kudankulam, Radhapuram Taluk Tirunelveli District,
Tamil Nadu - 627 106

156. The Station Director,
Kudankulam Nuclear Power Project, Unit -2
Nuclear Power Corporation of India Ltd.,
P.O. Kudankulam, Radhapuram Taluk Tirunelveli District,
Tamil Nadu - 627 106

157. The Chief Operating Officer,
LANCO- Kondapalli Power Ltd., Stage-II
Plot No.4, Software Units Layout,
Hitech City, Madhapur,
Hyderabad-500 081. Andhra Pradesh State

158. The Chief Operating Officer,
LANCO- Kondapalli Power Ltd., Stage-III
Plot No.4, Software Units Layout,
Hitech City, Madhapur,
Hyderabad-500 081. Andhra Pradesh State

159. General Manager (O&M),
NTPC Tamilnadu Energy Company Ltd.,
Vallur Thermal Power Project,
Vellivoyalchavadi P.O.,
Ponneri Taluk, Tiruvallur Dist.,
Chennai – 600103, Tamil Nadu State.

160. Sr. Vice President,
Meenakshi Energy Pvt. Ltd.,
Meenakshi, Plot No: 119,
Road No: 10, Jubliee Hills,
Hyderabad-500 033.

161. The Chief Executive Officer,
NLC Tamil nadu Limited,
2*500, MW JV Thermal Power Project,
Harbour Estate,
Tuticorin, PIN: 628004, Tamil Nadu State.

162. Thermal Power Tech Corporation India Limited,
SPSR Nellore, 6-3-1090,
A-Block, 5th Floor, TSR Towers,
Raj Bhavan Road, Somajiguda,
Hyderabad, 5000082.

163. Sr. Vice President,
Meenakshi Energy Pvt. Ltd.,
Meenakshi, Plot No: 119,
Road No: 10, Jubliee Hills,
Hyderabad-500 033.

164. The General Manager (Projects),
Simhapuri Energy Pvt. Ltd.,
Madhucon Greenlands, 6-3-866/2,
3rd Floor, Begumpet,
Hyderabad-500016.

165. Managing Director,
Coastal Energen Pvt. Ltd,
7th Floor, Buhari Towers,
4 ,Moores Road,
Chennai, PIN: 600006, Tamil Nadu State

166. The Chief Commercial Officer (CCO)
SEMBCORP Energy India Ltd.,
6-3-1090, A-Block, 5th Floor,
T.S.R Towers, Raj Bhavan Road,
Somajiguda, Hyderabad 500082, Telangana

167. Senior General Manager,
IL & FS Tamilnadu Power Company limited,
C. Pudhupettai post,
Parangipettai (via), Chidambaram(tk.),
Cuddalore-608502, Tamil Nadu.

168. General Manager,
Sembcorp Gayatri Power Ltd.,
TP Gudur Mandal,
Nellore-524344, Andhra Pradesh.

North Eastern Region

169. State Load Despatch Centre,
Agartala, 79 Tilla, Kunjaban, Agartala,
Tripura (West)

170. Department of Power,
Government of Nagaland, SLDC Nagaland,
Electricity Colony,
Full Nagarjan Dimapur, Nagaland

171. Mizoram State Load Despatch Centre,
Tuikhuahtlang, Aizawl -796001

172. State Load Despatch Centre,
Assam, SLDC, AEGCL,
Near 132kv Grid Sub Station,
Kahilipara, Guwahati

173. General Manager,
Doyang HEP, NEEPCO,
Wokha, Nagaland

174. General Manager,
Ranganadi HEP, NEEPCO,
P.O. Ranganadi Proj. Dist. Subansiri,
Ar. Pradesh-791121

175. General Manager,
AGBPP, NEEPCO,
Kathalguri, Tinsukia, Assam

176. General Manager,
AGTPP, NEEPCO,
Ramchandranagar, Agartala, Tripura

177. General Manager,
KHANDONG HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam

178. General Manager,
KOPILI HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam

179. General Manager,
KOPILI-2 HEP, NEEPCO,
Umrangsoo, N.C.Hills, Assam

180. Chief Engineer,
NHPC
Loktak HEP Leimatak-795124,Manipur

181. Ranganadi HEP (NEEPCO)
Ranganadi HEP, NEEPCO Ltd.,
Yazali, Dist. Lower Subansiri,
Andhra Pradesh-791119

182. Managing Director,
ONGC Tripura Power Company Ltd,
6th Floor, A Wing, IFCI Tower-61,
Nehru Place, New Delhi, 110019

183. General Manager,
Bongaigaon TPP, NTPC Ltd.,
P.O.-Salakati, Kokrajhar Dist.
Assam-783369

184. Kameng HEP (NEEPCO),
EMG, Kameng HEP, NEEPCO, Kimi,
P.O.- Bhalukpong, Post Box-2, West Kameng
Dist., Arunachal Pradesh, PIN – 790114

185. Pare HEP (NEEPCO),
Pare HEP, NEEPCO Ltd, Sopo,
P.O- Doimukh, Dist- Papumpare,
Arunachal Pradesh, PIN – 791112

186. State Load Despatch Centre,
Agartala, 79 tilla, Kunjaban,
Agartala, Tripura (West)

187. Department of Power,
Government of Nagalnd,
SLDC Nagaland, Electricity Colony,
Full Nagarjan Dimapur, Nagaland.

188. Mizoram State Load Despatch Centre,
Tuikhuahtlang, Aizawl -796001

189. State Load Despatch Centre,
Assam, SLDC, AEGCL,
Near 132kv Grid Sub Station,
Kahilipara, Guwahati

…Respondents

190. Member Secretary,
Northern Regional Power Committee
18-A, Shaheed Jeet Singh Sasanwal Marg,
Katwaria Sarai,
New Delhi-110 016

191. Member Secretary,
Southern Regional Power Committee
29, Race Course Cross Road,
Bangalore-560 009.

192. Member Secretary,
Eastern Regional Power Committee
14, Golf Club Road,
Kolkata-700 033

193. Member Secretary,
Western Regional Power Committee
F-3, MIDC Area,
Andheri (East),
Mumbai-400 093

194. Member Secretary,
North Eastern Regional Power Committee
NERPC Complex,
Dong Parmaw,
Lapalang,
Shillong-6

195. Chief Engineer (Grid Management),
Central Electricity Authority Sewa Bhawan,
R.K.Puram,
New Delhi-110 022.

196. Chief Engineer
(National Power Committee),
Central Electricity Authority,
18-A, Shaheed Jeet Singh Sasanwal Marg,
Katwaria Sarai, New Delhi-110 016

…Proforma Respondents

Parties Present: Shri S.R. Narasimhan, NLDC
Shri N. Nallarasan, NLDC
Shri Phanisankar Chilakuri, NLDC

ORDER

The Petitioner, National Load Dispatch Centre (NLDC) is the system operator at the national level and has made the following prayers:

a) Direct all ISGS stations whose tariff is regulated / determined by CERC to install equipment as per the requirement mentioned in the Petition at the unit control rooms for transferring the required data for AGC by 30th June 2019.

b) Direct all ISGS stations whose tariff is regulated / determined by CERC to ensure communication from nearest wide band node to the RTU in the unit control room by 30th June 2019.

c) Direct Central Transmission Utility (CTU) to ensure communication availability

from NLDC/RLDCs to nearest wide band node/switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication by 30th June 2019.

d) Decide the mark up price for secondary regulation service through AGC.

e) Allow NLDC/RLDCs to test, tune and operate the AGC system for providing the signals to the power plants as and when they comply with the directions above.

f) Allow any variation in the generation during testing phase to be settled under DSM.

g) Allow NLDC/RLDCs to put all the Phase-I plants under continuous operation on AGC before 31st December 2019.

h) Direct Phase-II plants in the detailed modus operandi to provide infrastructure at RTU/internal communication.

i) Road map for implementation of AGC at RLDCs in future may be accepted.

j) Pass any other orders as this Commission may deem fit and proper under the given facts and circumstances.

SUBMISSIONS OF THE PETITIONER

2. The Petitioner has submitted that vide Order dated 13.10.2015 in petition no 11/SM/2015, the Commission gave the roadmap for 'Operationalization of Generation Reserves in the Country'. The Order mandated that each region should maintain primary, secondary and tertiary reserves. The objective of the Order was to introduce 'Spinning Reserves' in the country, which is one of the important components for ensuring grid security, quality and reliability by achieving adequacy of supply and maintaining load-generation balance. All generating stations that are regional entities were directed to 'must plan' operationalization of Automatic Generation Control (AGC) along with reliable telemetry and communication by 01.04.2017. The Commission noted that this would entail a one-time expense for the generators to install requisite software and firmware, which could be compensated for and that the communication infrastructure must be planned by the Central Transmission Utility (CTU) and developed in parallel, in a cost-effective manner.

3. The Commission directed the Petitioner to upload the detailed modus operandi on 'Operationalization of Spinning Reserves' on NLDC website and seek comments from the

stakeholders by 11.08.2017 and file the comments received from stakeholders within two weeks thereafter. Accordingly, the report was also uploaded on the NLDC website.

4. The Petitioner has submitted that the detailed implementation plan was also discussed in the National Power Committee (NPC) meeting held at Indore on 08.09.2017. An agenda on 'secondary frequency control' was sent to NPC for discussion in the respective Regional Power Committees (RPC). The Expert Group constituted (in May 2017) by the Commission to review and suggest measures for bringing power system operation closer to National Reference Frequency, recommended that the frequency control continuum as given in their report may be adopted and included as part of the Grid Code (hereinafter referred to as 'IEGC') through an amendment to Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010. Further, it was recommended that AGC must be implemented throughout the country at the earliest in line with the Commission's recommendation of treating a region as a balancing area and that the Performance Metrics for AGC payments may be introduced once sufficient experience is gained through the pilot project (carried out at Dadri generating station of NTPC). AGC at the intra-State level, particularly for large states, was to be implemented in line with directions by the Appropriate Commission(s).

5. The Petitioner has submitted that the Commission in its order dated 06.12.2017 in Petition No. 79/RC/2017 approved the Commissioning of the AGC Pilot Project between NLDC and NTPC Dadri Stage-II and various developments in the AGC Pilot were acknowledged by the Commission. Vide the above order, the Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Dadri Stage-II was successfully taken under remote as a part of AGC pilot project from NLDC from 1225 Hrs. of 04.01.2018 and is under continuous operation. Further, data is being submitted by NLDC to NRPC in the agreed format on a weekly basis.

6. The Petitioner has submitted that Karnataka Power Transmission Corporation Limited (KPTCL) together with (United States Agency for International Development (USAID) has proposed AGC pilot project on Varahi and Sharavathi Hydro Power Plants. On 10.02.2018, SRLDC, USAID and NLDC visited NP Kunta solar park in Andhra Pradesh for understanding the feasibility of AGC implementation. USAID agreed to take the AGC implementation at NP Kunta Solar power project under 'Greening the Grid' (GtG)-RISE

project. The matter was also discussed in the 33rd meeting of SRPC held on 17.02.2018 at Puducherry. A workshop was organised by USAID and NLDC on 15.05.2018 at Andhra Pradesh SLDC, Vijayawada to explain the basic architecture of the AGC project and the proposed project at NP Kunta to stakeholders.

7. On 18.05.2018, Letter of Award was issued by NTPC Simhadri to M/S Siemens for the supply, testing and commissioning of software and hardware and implementation of the AGC pilot project at NTPC-Simhadri. AGC on Barh (Eastern Region), Bongaigaon (North Eastern Region) and Mauda (Western Region) are power plants of NTPC under contracting phase of implementation.

8. The Petitioner has submitted that it has started up-gradation of SCADA from October 2017. AGC set up is envisaged to be capable of sending and receiving AGC signals to all Regional Entity generating stations to start with for the first time in India. The RLDCs' SCADA/EMS system was recently upgraded before AGC was notified through the Commission's Order. Hence, considering a region as a balancing area, AGC is being implemented through NLDC, which is a unique experiment as five (5) AGCs are being operated from a single control center at NLDC. Further, as a next step, discussion could start on the roadmap to progressively shift AGC control to RLDCs over the next 3-5 years. At the intra-regional level, discussion at RPC level is on for introducing AGC at least in the few intra-State generators in RE-rich States.

9. The Petitioner has submitted that the CERC (Communication System for inter-State transmission of electricity) Regulations, 2017 has provided detailed roles and responsibilities of various organizations with respect to communication. NLDC was given the responsibility for preparation and issuance of guidelines with the approval of the Commission on the interfacing requirements in respect of terminal equipment, RTUs, SCADA, PMUs, Automatic Generation Control (AGC), Automatic Meter Reading (AMR), Advanced Metering Infrastructure (AMI), etc. and for data communication to the respective control centres. The Generic Technical Specifications for AGC connecting equipment that has to be procured by the power plants were prepared by the Petitioner based on the experience of the AGC pilot project (at Dadri) for full scale implementation of AGC. Generating stations have to install AGC connecting equipment at the unit control rooms for transferring the required set of data for AGC.

10. The Petitioner has submitted that Regional Secondary Reserves quantum, mandated by the Commission are given as below:

Secondary Reserves quantum needed in MW (Region wise)	
NR	800
ER	660
WR	800
SR	1000
NER	363
Total	3623

11. The Petitioner has suggested that the detailed implementation plan pan-India for AGC implementation is proposed in the following manner:

Phase-I

(a) Inter-State Generating Stations (ISGS) generators, whose tariff is regulated/ adopted by the Commission, are proposed to be made capable of participating in 'Secondary Control' since the tariff for these generators is already available and there are fewer communication issues. This is also because in case of these generating stations, Ancillary Services/ AGC Pilot Project Framework is available for settlement (without the refund of fixed charges as mentioned in the Half Yearly Feedback on Ancillary Services and CERC Order on AGC Pilot Project) and, therefore, its implementation is expected to be dispute free. However, limiting AGC implementation to only these generating stations may not be sufficient to ensure availability of the full quantum of reserves as mandated by the Commission.

Phase-II

(b) All Regional Entity generating stations scheduled by RLDCs (over and above the Phase-I power stations mentioned above) can be made capable of participating in secondary control. However, Declared Capability (DC) at present is not taken from these generating stations by RLDCs. Some Independent Power Producers (IPP) have part Power Purchase Agreements with discoms/ traders while part capacity is untied, and power is sold under merchant contracts. Tariff for these generators has to be

decided and agreed upon *a priori* for secondary control participation of these generators. DC and Schedule have to be obtained from these generators similar to Central Sector generating stations for reserve estimation. Many of these regional entity generating stations operate in the day-ahead energy market and the day-ahead prices may have a significant role in respect of these generating stations as far as availability to the grid at any instant is concerned. Low prices in the Day-Ahead Market (DAM) on a sustained basis may lead to many of these units remaining off the grid. The following, inter-alia, may be the requirements for the Regional entity generating stations equipped under Secondary Control:

- The generating stations shall bear the cost of secondary control hardware at the generating station end including the cost of the fibre optic cable from the generating station control room to the nearest communication node.
- Share DC and Schedule like ISGS generators on day ahead basis and subsequent revisions with RLDCs.
- Payment for energy and incentive will be as decided by the Commission.
- The generating stations shall have working control systems for turbine, boiler and governor. Governor response plots/ graphs of past incidents have to be submitted to concerned RLDC.
- Existing wide band communication node to be established within a radius below 30-40 km from the plant to communicate with the nearest RLDC. Distance need not be a binding limitation and the connectivity of the generating station with the communication node can be seen on case to case basis based on merit.

12. The Petitioner has submitted that Primary, secondary and tertiary generation reserves are required for frequency control and ensuring reliable operation of the grid, particularly under high Renewable Energy (RE) penetration. Primary control provision has been existing in the IEGC but its enforcement has been an issue that has been highlighted before the Commission. Secondary control had been absent in the system so far while tertiary frequency control was introduced only in April 2016 through the Central Electricity Regulatory Commission (Reserves Regulation Ancillary Services) Regulations, 2016 (or for short, RRAS Regulations). Through Order dated 16th July 2018 in Petition No. 07/SM/2018, Fast Response Ancillary Services or FRAS was ordered by the Commission for central sector hydro stations and is under implementation phase.

13. The Petitioner has submitted that the following issues become important when one looks at the entire continuum of frequency control:

i. Ensuring accurate load forecasting and Renewable Energy (RE) forecasting: This is the first step towards reliability as generating units need to get committed based on the forecasts. Starting from Discom level, the forecasts need to be aggregated for the State at SLDCs level, at RLDCs for the regional level and at NLDC for the All-India level.

ii. Evaluating Area Control Error (ACE) of each control area: Bias may be taken as equal to Frequency Response Characteristics (FRC) of the State in past ten events. For ACE, high quality measurement of line flows and frequency at 10 seconds or better periodicity at LDCs is a must. Further, seamless transfer of schedule data from off-line systems to SCADA must be ensured. RLDCs are already bringing forth the non-availability of real time data in the RPC forums and this needs to be addressed promptly.

iii. Primary Response: The SLDCs must also monitor the primary response from the generating units within the State and report to the respective SERCs as directed by CERC vide its order dated 31st July 2017 in Petition No. 84/MP/2015.

iv. Measurements: For AGC, high quality measurements are needed for inter-regional tie lines and generating stations under AGC. As stated above, periodic monitoring of the data quality needs to be done at the RPC forums and chronic problems of non-availability of data are addressed promptly so that real time operation is smooth.

v. Fiber Optic Communication: Fiber optic communication from Regional Entity generating station to nearest CTU node and from there on to RLDCs/ NLDC is a must and it could be closely monitored through the RPC forums. This is required irrespective of whether we have a regulated system of secondary reserves procurement or a market based one.

vi. Participation: ACE is allocated to the generating stations under AGC based on the selected participation factor mode in the AGC software. The participation of each generating station will be calculated by the AGC software based on the weightage assigned to different attributes of the plant and the grid. Spinning reserve availability, ramp rate and variable cost of the generating station are the important attributes that are typically considered. In case of inter-/ intra-regional transmission constraints during

outages, certain plants may not be able to participate in AGC till normalization of transmission system.

14. The Petitioner has submitted that 'Spinning Reserves' viz. DC on bar minus schedules available in real time in ISGS is currently used for rescheduling/ tertiary reserves by States, tertiary frequency control through Reserves Regulation Ancillary Services and now being envisaged for secondary control through AGC. It is also available for primary control though the IEGC clearly specifies that the schedules should not exceed capacity on bar less Normative Auxiliary Consumption. This ensures that even if the power plant is fully scheduled, the overload capacity and margins in auxiliary consumption is able to provide primary response.

15. The Petitioner has submitted that after the forecast of load and RE generation, the scheduling of conventional generation resources by the States assumes importance. Here, apart from scheduling, the States also need to indicate the amount of hot spinning reserves it is holding. The reserves could be held either within the State or at the ISGS where the State has a share but it should be replenished whenever there is a contingency such as a generating unit tripping within the State. Unless such a mechanism is in place, the secondary control would not work as all the reserves would get depleted quickly. DC on bar less the schedules equals the hot spinning reserves. It was observed that hot spinning reserve gets depleted daily during the morning and evening peak hours when States requisition their full entitlement. Under this situation, the State utilities ought to have reserves elsewhere within the State.

16. The Petitioner has submitted that on 06.09.2018, the Commission has issued a discussion paper on *'Redesigning Ancillary Services Mechanism in India'* and comments were invited from stakeholders. The Petitioner is of the view that the physical infrastructure in terms of communication and suitable hardware/ software at the power plants is sine qua non for secondary control through AGC irrespective of whether the same is regulated or market-based. The only variable is the quantum of secondary reserves required on day to day basis.

PROCEEDINGS DURING HEARING

17. The Petition was admitted on 25.10.2018. During the hearing on 31.1.2019, the

Petitioner submitted that the present petition has been filed for implementation of AGC in India.

18. The Petitioner further submitted that the Commission in its Order dated 06.12.2017 in Petition No. 79/RC/2017 approved the commissioning of AGC pilot project between NLDC and NTPC Dadri Stage-II and the Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Accordingly, one plant in each region has been identified and AGC has also been commissioned in Simhadri and Mauda generating station.

19. The Petitioner requested the Commission to direct ISGS to install the equipment in power plants for accepting signals from NLDC. After hearing, the Commission directed the Petitioner to furnish the Minutes of Meeting held with RPCs wherein RPCs have given their consent to the AGC pilot project. The Commission further directed the Petitioner to submit the feedback report on the operation of AGC at NTPC Dadri Stage-II along with the summary of findings of this pilot project.

20. The Petitioner has complied with the directions and submitted the minutes of the special meetings on AGC pilot project which were held with all RPCs. The Petitioner has also submitted the feedback report before the Commission on 15th February 2019, highlighting the learning from the pilot project. Several learning including those on the implementation aspects, communication protocols, generator regulation and load following capabilities, metering, monitoring, visualisation, accounting etc. were gathered via pilot project and explained in the feedback report. The Pilot projects have also provided capacity building in the field of AGC which will be useful during implementation of secondary control on a large scale.

ANALYSIS & DECISION

21. We have heard the Learned Counsels for the Petitioner and have carefully perused the records.

22. The Commission is of the view that the most important responsibility of the Power System operators is to maintain reliability of the Power System by maintenance of Load -

Generation balance. For a large complex grid such as the Indian grid, primary, secondary and tertiary frequency controls are must-have tools to ensure reliability. With the objective of ensuring grid security, quality and reliability, the Commission vide Order dated 13.10.2015 in Petition no 11/SM/2015 had laid down a roadmap for *'Operationalization of Generation Reserves in the Country'*. It was envisaged that apart from the primary reserve at the national level, secondary reserve should be maintained by each region and tertiary reserve by each State. All the generating stations that are regional entities were directed to plan to operationalize AGC along with reliable telemetry and communication by 01.04.2017. The NLDC was directed to submit a detailed procedure to operationalize reserves in the country vide Order dated 13.10.2015.

23. The Commission notes that an 'outline procedure' was submitted by NLDC vide letter dated 15.12.2015 in which it was proposed to take up a pilot project with one of the NTPC plants in a region based on which further activities could be taken up. On 05.02.2016, NLDC was advised to submit the draft detailed procedure and implementation plan for operationalization of Reserves within three months of implementation of Ancillary Services Regulations. After various brainstorming sessions and meetings, NLDC submitted the detailed procedure on Operationalization of Spinning Reserves on 14.07.2017 and recommended that secondary control should be added as an Ancillary Service.

24. The Commission observes that the 'National Electricity Policy' also mandates that adequate reserves may be maintained to ensure secure grid operation. The Commission is of the view that collective efforts of the stakeholders in implementation of the AGC are a step forward and will go a long way in development of the secondary reserves in the country leading to stable frequency operation and grid security and reliability.

25. The Commission observes that the feedback on implementation of AGC submitted by NLDC highlights the need for enhancing adequacy of reserves in the country. It has been stated that valuable experience has been gained in terms of implementation aspects, communication protocols, generator regulation and load following capabilities, cyber security etc. which is useful during implementation of secondary control on a large scale. The Petitioner has submitted that from the interactions with national and international experts on power systems and experience with Ancillary Services till date, the general understanding was that different solutions as a package like load and Renewable Energy (RE) generation

forecast, proper portfolio management by the States, primary response from the generators, secondary control in the form of AGC, Ancillary Service products in different timeframes etc. are needed for stable frequency operation of the power system. No unique solution existed. NLDC report emphasised that a bad or no forecast of load/ RE generation and poor portfolio management by the State utilities would lead to heavy deviations from schedule and grid indiscipline exhausting all reserves in the system and making the system insecure. AGC effectiveness would have to be seen in this overall context. It was further highlighted in the feedback report that deployment of two-three plants under AGC with 200 MW-300 MW reserve might not be sufficient for a grid size like that of India. The Commission observes that the Expert Group on 'National Reference Frequency' in its report submitted to the Commission in November 2017 recommended that AGC must be implemented throughout the country at the earliest and Performance Metrics for such AGC payments may be introduced once sufficient experience is gained through the pilot project.

26. The Petitioner has suggested that implementation of AGC be undertaken in Phases. Under Phase-I, ISGS generators, whose tariff is regulated/ adopted by the Commission, are proposed to be made capable of participating in 'Secondary Control'. Dadri Stage-II NTPC in Northern Region was the first AGC pilot project of the country which was approved by the Commission vide Order in Petition No.79/RC/2017 on 06.12.2017 and is in continuous operation from 1225 Hrs. of 04.01.2018. The Commission also directed that similar pilot projects may be replicated by NLDC, in at least one other regional grid of the country. Accordingly, four more AGC pilot projects have been/are being implemented viz. Simhadri Stage-II in Southern Region, Mauda Stage-II in Western Region, Barh Stage-II in Eastern Region and Bongaigaon in North-Eastern Region.

27. The Commission observes that there is one-time expense involved for the generators to install requisite software and firmware. The Commission has been informed that the implementation cost i.e. placing of order for the equipment and integration cost of the four AGC pilot projects which have been commissioned viz. Dadri Stage-II NTPC in Northern Region Simhadri Stage-II in Southern Region, Mauda Stage-II in Western Region and Barh Stage-II in Eastern Region, is in the range of Rs. 30.00 lakhs to Rs. 50 lakhs per generating station. The Commission accepts the Petitioner's proposition that the cost of such equipment at generating stations for AGC implementation is not significant and ideally all ISGS stations should be AGC enabled. The Commission notes that majority of the thermal stations

regulated by the Commission have station capacity of 200 MW and above and the AGC support is mainly expected from these facilities apart from the hydro generating stations other than Run-of-River projects. It will therefore be prudent, also from the point of view of cost effectiveness to ensure that the thermal generating stations with installed capacity of 200 MW and above and all hydro stations with capacity exceeding 25 MW necessarily have the capability to provide AGC support. Further, the Commission is of the view that with due regard to the nature of the Run-of-River Hydro projects it may not be advisable to mandate such plants to provide AGC support, as this might lead to spillage/ under-utilization of water, which should be avoided. Accordingly, the Commission directs all thermal Inter State Generating Stations (ISGS) that are regional entities with installed capacity of 200 MW and above and all hydro stations with capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by the Commission, to install the required software and firmware for implementation of AGC at the unit control rooms for transferring the required set of data for AGC. These regional entity generators may approach the Commission under relevant regulations and provisions of PPA for compensation of this one-time cost. The Commission also directs the Central Transmission Utility and the NLDC to commission the required communication system in parallel.

28. Once the aforesaid generating stations are AGC enabled, NLDC/ RLDCs shall be allowed to test, tune and operate the AGC system for providing the signals to the power plants. With this decision to make the ISGS stations AGC compliant, the Commission is of the view that any other pilot beyond the five pilots already initiated by NLDC, may not be needed.

29. As regards compensation for AGC support and deviation charges, it is clarified that the framework in this regard as stipulated in the Commission's Order in Petition no. 79/RC/2017 dated 06.12.2017 shall apply to the five pilot projects as also to other ISGS as and when they are AGC enabled. This arrangement shall remain in place till further Orders or till relevant regulations inter-alia on compensation for AGC services are framed by the Commission.

30. The Commission has noted the suggestions of the Petitioner for covering under Phase-II, other regional entity generators (other than those whose tariff is determined or adopted by

the Commission). The Commission is of the view that decision on this issue cannot be taken in the present petition. It needs wider consideration.

31. The Commission observes that NLDC in its report on implementation of RRAS, has recommended moving towards market-based procurement of ancillary service for a more robust design. The relevant excerpt is reproduced below:

> *"Once the scope of present implementation of ancillary services is enlarged from the regulated generation stations at inter-state level to include state-level generators also, a critical mass would be achieved. Moreover as more and more generators start participating in regulation services, closer monitoring of the performance of generating stations would also be needed. The implementation would also be more robust by design and subsequently, based on the experience gained, market based procurement of ancillary services could also be thought of."*

32. The Commission is of the view that the experience gained under RRAS underlines the need for a calibrated approach to transform the extant administered Ancillary Services mechanism to a market-based mechanism with the objective of increasing the ambit of potential providers of such services at efficient costs and enhanced reliability of the grid. The Staff Paper on *'Redesigning Ancillary Services Mechanism in India'* issued by staff of the Commission on 06.09.2018 has highlighted that the physical infrastructure in terms of communication and suitable hardware/ software at the power plants is sine qua non for secondary control through AGC irrespective of the fact whether the same is regulated or market-based. The only variable is the quantum of secondary reserves required on day to day basis.

33. The Commission observes that given the changes in technology, generation mix and increasing decentralized generation, and locational ancillary requirements, long term bilateral contracts for ancillary support should be avoided. Same resource can provide multiple flexibility services. For example, a generator that can provide fast tertiary response can also provide slow tertiary response. An arrangement which bundles multiple flexibility services has some advantages – by allowing such generators to utilize their capabilities to serve various system requirements thereby reducing the cost of providing individual services. Accordingly, the Commission directs the staff of the Commission to initiate a comprehensive review of Ancillary services framework based on these principles, and present to the Commission for suitable decision.

SUMMARY

34. In the interest of reliable and safe grid operation, the Commission directs that all the ISGS stations whose tariff is determined or adopted by CERC shall be AGC-enabled and the ancillary services including secondary control through AGC be implemented as per the following direction:

i. *All thermal ISGS stations with installed capacity of 200 MW and above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC are directed to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by NLDC. NLDC shall notify the said requirements within one month of this order.*
ii. *All such ISGS stations whose tariff is determined or adopted by CERC shall have communication from the nearest wide band node to the RTU in the unit control room.*
iii. *The Central Transmission Utility (CTU) is directed to have communication availability from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication.*
iv. *The NLDC is also directed to commission the required communication infrastructure.*
v. *The expenditure as a result of compliance of the above directions may be claimed as per relevant regulations or provisions of the PPA.*
vi. *The NLDC is directed to monitor implementation of the above directions so that all the ISGS stations whose tariff is determined or adopted by CERC are AGC-enabled within six months of this order.*
vii. *The framework regarding compensation for AGC support and deviation charges as stipulated in the Commission's Order in Petition no. 79/RC/2017 dated 06.12.2017 shall apply to the five pilot projects as also to other ISGS as and when they are AGC enabled. This arrangement shall remain in place till the relevant regulations interalia on compensation for AGC services are framed by the Commission.*
viii. *NLDC/RLDCs are allowed to operate the AGC system for enabling the signals to the power plants at the earliest.*

ix. All new thermal ISGS stations with installed capacity of 200 MW and above and hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC shall mandatorily have the capability to provide AGC support.

35. With the above directions, Petition No. 319/RC/2018 stands disposed of.

Sd/-	**Sd/-**	**Sd/-**
आई. एस. झा	**डॉ एम. के. अय्यर**	**पी. के. पुजारी**
सदस्य	**सदस्य**	**अध्यक्ष**

FORM-15

FORM- 15 : Details of Fuel for Computation of Energy Charges

ame of t e et t one — T C L m ted
ame of t e Gene at ng Stat on — Ba aun Stage-II

S. o.	Mont	Unit	A -23		
			Domest c (T C M nes)	Domest c (Ot er Sou ces)	Im o ted
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	25406.34	12907.75	0.00
2	Value of Stock	(Rs.)	88031465.99	53345671.86	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	245776.18	3724.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	245776.18	3724.00	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1966.21	29.79	0.00
7	Net Coal Supplied (5-6)	(MT)	243809.97	3694.21	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	597607733.28	10319144.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	9957071.47	150869.52	0.00
11	Total amount Charged (8+9+10)	(Rs.)	607564804.75	10470013.52	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		228137321.00	3152748.00	0.00
	By Road		7242392.04	109736.70	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	136783.25	2072.54	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	235516496.29	3264557.24	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	843081301.04	13734570.76	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3458.60**	**4040.50**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3458.60**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5239	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	4901	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3641	2573	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3523	2923	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3534**		

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Chartered Accountants

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	May-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	49331.31	762.95	0.00
2	Value of Stock	(Rs.)	170617499.73	3082719.82	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	222174.47	7878.29	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	222174.47	7878.29	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1777.40	63.03	0.00
7	Net Coal Supplied (5-6)	(MT)	220397.07	7815.26	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	551215013.00	26414100.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	10677359.01	378618.35	0.00
11	Total amount Charged (8+9+10)	(Rs.)	561892372.01	26792718.35	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		196604252.00	6593581.00	0.00
	By Road		7090002.16	251410.94	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	333725.71	11833.89	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	204027979.87	6856825.83	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	765920351.88	33649544.18	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3472.15**	**4282.04**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3472.15**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5163	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5101	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3534	2651	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3496	3197	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3503**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited

Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Jun-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	46654.39	544.22	0.00
2	Value of Stock	(Rs.)	161991101.06	2330363.50	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	173488.71	51320.14	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	173488.71	51320.14	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1387.91	410.56	0.00
7	Net Coal Supplied (5-6)	(MT)	172100.80	50909.58	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	439326909.68	238101950.75	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	10287299.46	3043112.42	0.00
11	Total amount Charged (8+9+10)	(Rs.)	449614209.14	241145063.17	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		157049764.52	52698908.00	0.00
	By Road		4756116.51	1406919.02	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	383117.11	113330.86	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	162188998.15	54219157.87	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	611803207.29	295364221.04	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3537.26**	**5785.67**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3537.26**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5106	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5179	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3503	3148	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3568	3516	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3553**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Jul-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	24448.19	35263.80	0.00
2	Value of Stock	(Rs.)	86479628.51	204024620.47	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	228033.57	3896.98	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	228033.57	3896.98	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1824.27	31.18	0.00
7	Net Coal Supplied (5-6)	(MT)	226209.30	3865.80	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	574054602.61	5130483.25	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	250759.38	4285.35	0.00
11	Total amount Charged (8+9+10)	(Rs.)	574305361.99	5134768.60	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		204691427.00	3603829.00	0.00
	By Road		4142184.14	70787.86	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	279652.26	4779.12	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	209113263.40	3679395.98	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	783418625.39	8814164.58	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3470.47**	**5439.33**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3470.47**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5178	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5201	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3553	3512	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3271	3758	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3299**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Aug-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	46484.49	24495.60	0.00
2	Value of Stock	(Rs.)	161322827.08	133239640.63	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	149656.62	3925.45	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	149656.62	3925.45	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1197.25	31.40	0.00
7	Net Coal Supplied (5-6)	(MT)	148459.37	3894.05	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	376176917.63	15710967.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	5064375.44	132837.11	0.00
11	Total amount Charged (8+9+10)	(Rs.)	381241293.07	15843804.11	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		139169880.00	3491187.00	0.00
	By Road		3341324.03	87641.97	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	387469.93	10163.22	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	142898673.96	3588992.19	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	524139967.03	19432796.30	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3516.21**	**5377.75**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3516.21**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5180	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5201	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3299	3536	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3390	4066	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3369**		

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Chartered Accountants

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Sep-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	73094.85	28389.65	0.00
2	Value of Stock	(Rs.)	257016582.28	152672436.93	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	57135.63	132.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	57135.63	132.00	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	457.09	1.06	0.00
7	Net Coal Supplied (5-6)	(MT)	56678.54	130.94	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	149314069.00	415535.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	12356824.03	28547.87	0.00
11	Total amount Charged (8+9+10)	(Rs.)	161670893.03	444082.87	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		53682648.00	95981.00	0.00
	By Road		1986517.56	4589.44	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	321141.55	741.93	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	55990307.11	101312.37	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	217661200.14	545395.24	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3657.74**	**5372.18**	**0.00**
20	Blending Ratio (Domestic/Imported)		85.00%	15.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3914.91**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5183	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5201	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4689**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3369	3609	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3709	4510	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3542**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**

Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Oct-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	63029.40	16742.59	0.00
2	Value of Stock	(Rs.)	230545363.67	89944263.02	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	138669.63	7863.89	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	138669.63	7863.89	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1109.36	62.91	0.00
7	Net Coal Supplied (5-6)	(MT)	137560.27	7800.98	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	348919104.58	17084084.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	1634015.01	92664.23	0.00
11	Total amount Charged (8+9+10)	(Rs.)	350553119.59	17176748.23	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		127042225.52	9940352.00	0.00
	By Road		0.00	0.00	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	196382.68	11136.77	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	127238608.20	9951488.77	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	477791727.79	27128237.00	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3531.27**	**4769.99**	**0.00**
20	Blending Ratio (Domestic/Imported)		90.00%	10.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3655.15**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	5185	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	4312	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4632**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3510	3720	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3540	2950	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3525**		

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For M.C. Bhandari & Co.
Chartered Accountants

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Nov-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	20322.67	4513.57	0.00
2	Value of Stock	(Rs.)	71764924.52	21529670.44	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	201846.53	0.00	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	201846.53	0.00	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1614.77	0.00	0.00
7	Net Coal Supplied (5-6)	(MT)	200231.76	0.00	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	508890209.90	0.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	10315600.26	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	519205810.16	0.00	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		184726344.54	0.00	0.00
	By Road		5922025.99	0.00	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	0.00	0.00	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	190648370.53	0.00	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	709854180.69	0.00	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3543.88**	**4769.99**	**0.00**
20	Blending Ratio (Domestic/Imported)		100.00%	0.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3543.88**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	4906	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	0	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4601**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3531	3475	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3724	0	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3703**		

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Chartered Accountants

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Dec-23		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	50220.43	4513.57	0.00
2	Value of Stock	(Rs.)	177975331.06	21529670.44	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	204896.41	15135.19	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	204896.41	15135.19	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1639.17	121.08	0.00
7	Net Coal Supplied (5-6)	(MT)	203257.24	15014.11	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	517774574.31	55021389.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	15397878.78	1137403.14	0.00
11	Total amount Charged (8+9+10)	(Rs.)	533172453.09	56158792.14	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		189829080.54	16977623.00	0.00
	By Road		10278140.92	759220.80	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	655060.43	48387.69	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	200762281.89	17785231.49	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	733934734.98	73944023.63	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3597.60**	**4889.15**	**0.00**
20	Blending Ratio (Domestic/Imported)		86.00%	14.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3778.41**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	4906	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	4142	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4561**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3703	3475	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3643	3221	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3603**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Jan-24		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	155665.67	3604.68	0.00
2	Value of Stock	(Rs.)	560022076.25	17623805.68	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	141449.06	15349.49	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	141449.06	15349.49	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1131.59	122.80	0.00
7	Net Coal Supplied (5-6)	(MT)	140317.47	15226.69	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	357330387.98	37490728.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	3675259.09	398824.51	0.00
11	Total amount Charged (8+9+10)	(Rs.)	361005647.07	37889552.51	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		129988009.00	19449311.00	0.00
	By Road		0.00	0.00	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	222081.34	24099.39	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	130210090.34	19473410.39	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	491215737.41	57362962.90	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3551.68**	**3982.01**	**0.00**
20	Blending Ratio (Domestic/Imported)		92.00%	8.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3586.11**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	4318	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	3550	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4529**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3656	3280	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3578	3253	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3590**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Feb-24		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	106720.14	2373.37	0.00
2	Value of Stock	(Rs.)	379035928.43	9450801.98	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	188761.25	40953.47	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	188761.25	40953.47	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1510.09	327.63	0.00
7	Net Coal Supplied (5-6)	(MT)	187251.16	40625.84	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	478072323.62	121115774.00	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	6725624.88	1459185.49	0.00
11	Total amount Charged (8+9+10)	(Rs.)	484797948.50	122574959.49	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		172476987.19	47165815.00	0.00
	By Road		10543193.05	2287441.62	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	420854.95	91308.31	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	183441035.19	49544564.93	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	668238983.69	172119524.42	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3562.51**	**4222.64**	**0.00**
20	Blending Ratio (Domestic/Imported)		85.00%	15.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3661.53**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	3696	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	4310	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4552**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3619	3258	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3616	3023	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3530**		

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FORM- 15 : Details of Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station Barauni Stage-II

S. No.	Month	Unit	Mar-24		
			Domestic (NTPC Mines)	Domestic (Other Sources)	Imported
A)	**OPENING QUANTITY**				
1	Opening Quantity of Coal	(MT)	111368.30	10775.22	0.00
2	Value of Stock	(Rs.)	396750377.66	45499885.24	0.00
B)	**QUANTITY**				
3	Quantity of Coal supplied by Coal Company	(MT)	206974.27	14255.59	0.00
4	Adjustment (+/-) in quantity supplied made by Coal Company	(MT)	0.00	0.00	0.00
5	Coal supplied by Coal Company (3+4)	(MT)	206974.27	14255.59	0.00
6	Normative Transit & Handling Losses (For Coal based Projects)	(MT)	1655.79	114.04	0.00
7	Net Coal Supplied (5-6)	(MT)	205318.48	14141.55	0.00
C)	**PRICE**				
8	Amount charged by the Coal Company	(Rs.)	523595801.90	71755759.60	0.00
9	Adjustment (+/-) in amount charged made by Coal Company	(Rs.)	0.00	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	12084207.68	832313.65	0.00
11	Total amount Charged (8+9+10)	(Rs.)	535680009.58	72588073.25	0.00
D)	**TRANSPORATION**				
12	Transportation charges by rail/ship/road transport	(Rs.)			
	By Rail		192608603.00	12929663.00	0.00
	By Road		6896769.08	475022.87	0.00
13	Adjustment (+/-) in amount charged made by Railways/Transport Company	(Rs.)			
14	Demurrage Charges, if any	(Rs.)			
15	Cost of diesel in transporting Coal through MGR system, if applicable	(Rs.)	470045.58	32374.93	0.00
16	Total Transportation Charges (12+13+14+15)	(Rs.)	199975417.66	13437060.80	0.00
17	Other Charges	(Rs.)			0.00
18	Total amount Charged for Coal supplied including Transportation (11+16)	(Rs.)	735655427.24	86025134.05	0.00
E)	**TOTAL COST**				
19	Landed cost of Coal (2+18)/(1+7)	Rs./MT	**3575.79**	**5278.58**	**0.00**
20	Blending Ratio (Domestic/Imported)		93.00%	7.00%	0.00%
21	**Weighted average cost of Coal**	**Rs./MT**	**3694.99**		
F)	**QUALITY**				
22	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	(kCal/Kg)	4601	4276	
23	GCV of Domestic Coal supplied as per bill of Coal Company	(kCal/Kg)	4601	5048	
24	GCV of Imported Coal of the opening stock as per bill Coal Company	(kCal/Kg)			0.00
25	GCV of Imported Coal supplied as per bill Coal Company	(kCal/Kg)			0.00
26	**Weighted average GCV of coal as Billed**	**(kCal/Kg)**	**4609**		
27	GCV of Domestic Coal of the opening stock as received at Station	(kCal/Kg)	3617	3036	
28	GCV of Domestic Coal supplied as received at Station	(kCal/Kg)	3712	3118	
29	GCV of Imported Coal of opening stock as received at Station	(kCal/Kg)			0
30	GCV of Imported Coal supplied as received at Station	(kCal/Kg)			0
31	**Weighted average GCV of coal as Received**	**(kCal/Kg)**	**3636**		

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FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Apr-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	5815.64
2	Value of Opening Stock	(Rs.)	474988633
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**81674.30**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9270.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9270.00**

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FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	May-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	4356.64
2	Value of Opening Stock	(Rs.)	355825834
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**81674.30**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9270.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9270.00**

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FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Jun-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	3097.64
2	Value of Opening Stock	(Rs.)	252997895
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**81674.30**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9270.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9270.00**

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For M.C. Bhandari & Co.
Chartered Accountants

Sanjay Sinha Digitally signed by Sanjay Sinha Date: 2024.08.21 15:44:10 +05'30'

Rajesh Vishwakarma Digitally signed by Rajesh Vishwakarma Date: 2024.05.25 12:37:15 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Jul-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	2073.64
2	Value of Opening Stock	(Rs.)	169363415
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	2970.23
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	2970.23
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	2970.23
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	206214682.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	206214682.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	206214682.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**74462.23**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9270.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9312.00**

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For M.C. Bhandari & Co.
Chartered Accountants

Sanjay Sinha Digitally signed by Sanjay Sinha Date: 2024.08.21 15:51:35 +05'30'

J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:13:10 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Aug-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	3964.87
2	Value of Opening Stock	(Rs.)	295233353
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**74462.23**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9312.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9312.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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J.Arunmanira j Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:14:28 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Sep-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	3693.87
2	Value of Opening Stock	(Rs.)	275054089
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**74462.23**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9312.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9312.00**

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For M.C. Bhandari & Co.
Chartered Accountants

Sanjay Sinha Digitally signed by Sanjay Sinha Date: 2024.08.21 15:44:41 +05'30'

J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:15:17 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Oct-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	0.73
2	Value of Opening Stock	(Rs.)	58016
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**79473.32**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9312.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9312.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Nov-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	0.73
2	Value of Opening Stock	(Rs.)	58016
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	3161.35
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	3161.35
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	3161.35
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	216774433.38
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	216774433.38
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	216774433.38
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**68572.73**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9187.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9187.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:17:31 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Dec-23
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	2316.08
2	Value of Opening Stock	(Rs.)	158819922
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	2970.23
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	2970.23
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	2970.23
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	226564446.13
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	226564446.13
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	226564446.13
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**72902.34**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9187.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9187.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:18:19 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Jan-24
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	5186.31
2	Value of Opening Stock	(Rs.)	378527095
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**72985.82**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9187.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9187.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:19:11 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Feb-24
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	4657.31
2	Value of Opening Stock	(Rs.)	339917596
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**72985.82**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9187.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9187.00**

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For M.C. Bhandari & Co.
Chartered Accountants

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J.Arunmaniraj Digitally signed by J.Arunmaniraj Date: 2024.08.13 18:20:32 +05'30'

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: **NTPC Limited**
Name of the Generating Station **Barauni Stage-II**

S. No.	Month	Unit	Mar-24
A)	**OPENING QUANTITY**		
1	Opening Stock of Oil	(KL)	4552.31
2	Value of Opening Stock	(Rs.)	332254084
B)	**QUANTITY**		
3	Quantity of LDO supplied by Oil company	(KL)	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00
6	Normative transit & Handling losses	(KL)	0.00
7	Net Oil supplied (5-6)	(KL)	0.00
C)	**PRICE**		
8	Amount charged by Oil Company	(Rs.)	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00
D)	**TRANSPORATION**		
12	Transportation charges by rail/ship/road transport	(Rs.)	
	By Rail		Inclusive
	By Road		
	By Ship		
	……..		
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	
14	Demurrage Charges, if any	(Rs.)	
15	Total Transportation Charges (12+13+14+15)	(Rs.)	
16	Other Charges	(Rs.)	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00
E)	**TOTAL COST**		
18	**Weighted average cost of Oil**	**(Rs./KL)**	**72985.82**
F)	**QUALITY**		
19	GCV of Oil of the opening stock as per Oil Company	Kcal/KL	9187.00
20	**Weighted average GCV of Oil**	**Kcal/KL**	**9187.00**

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For M.C. Bhandari & Co.
Chartered Accountants

Sanjay Sinha Digitally signed by Sanjay Sinha Date: 2024.08.21 16:03:12 +05'30'

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