PETITION FOR DETERMINATION OF TARIFF

FOR

Unchahar Stage-I

(From 01.04.2024 to 31.03.2029)

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 Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 MW) **for the period from 01.04.2024 to 31.03.2029**.

INDEX

Summary of Issues:

Tariff determination petition (2024-29) of Unchahar-I (420 MW)

(In compliance with CERC notice dated 07.06.2024)

The major highlights of the tariff determination petition of Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 MW) (hereinafter referred to as Unchahar-I) for tariff period 2024-29 are as follows:-

The present petition is being 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(2) of Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2024 for determination of Tariff of Unchahar-I(420 MW) for the period from 01.04.2019 to 31.03.2024.

Unchahar-I is located in the State of Uttar Pradesh (UP) and comprises of two units of 210 MW . The COD of station is 13.02.1992.The power generated from Unchahar-I is being supplied to various discoms as per MoP allocation and respective PPAs including Uttar Pradesh Power Corp. Ltd. (UPPCL), BSES Rajdhani Power Ltd. (BRPL), BSES Yamuna Power Ltd. (BYPL), Tata Power Delhi Distribution Ltd. (TPDDL), Haryana Power Purchase Centre (HPPC), Power Development Department (J&K), Electricity Department (Chandigarh) , Gujarat Urja Vikas Nigam Ltd.(GUVNL) and Uttarakhand Power Corporation Ltd. (UPCL).

The tariff for Unchahar-I for the period from 01.04.2019 to 31.3.2024 was determined by the Hon'ble Commission vide order dated 07.10.2022 in Petition No. 431/GT/2020. The capital cost allowed for tariff determination included the projected additional capital expenditure admitted by the Hon'ble Commission after prudence check. The petitioner had filed a separate true up petition for the period 01.04.2019 to 31.03.2024 for revision of tariff in line with the applicable provisions of Tariff Regulations 2019.

The Petitioner in the instant petition has considered the opening capital cost as of 01.04.2024 by adjusting the admitted capital cost as on 31.03.2024, accounting for the

difference between the admitted expenditure for the period 2019-24 and the actual expenditure as per true-up petition.

The projected additional Capital Expenditure for the FY 2024-25, 2025-26, 2026-27, 2027-28 and 2028-29 are Nil, Rs 0.88 Cr, Rs 19.86 Cr, Rs 27.40 Cr and Rs. 14.02 Cr respectively amounting to total of Rs 62.17 Crores during the 2024-29 period. The same has been depicted year wise in Form 9A of the Appendix-I along with applicable regulations and justification for the claims. It is humbly requested to approve the projected Additional Capital expenditure during the period of 2024-29.

The Hon'ble Commission is requested to allow the claims for water charges, security expenses, and ash transportation expenses for the instant station as estimated by the Petitioner in Form 3A of Appendix-I. These claims shall be subject to retrospective adjustment based on actual expenditures during the truing-up process.
Furthermore, the consumption of capital spares shall be claimed at the time of truing up based on the actual consumption of spares during the period 2024–29.

Further, in order to avoid interest liabilities for beneficiaries until the 2024-29 tariff order is finalized, the petitioner requests permission to recover ash transportation charges monthly subject to true-up at the end of the 2024-29 period.

The petitioner seeks permission to approach the Commission to recover the impact of wage revisions effective from 1.1.2027, as allowed under Tariff Regulations 2024, during the tariff true-up based on actual payments made.

The petitioner requests the Commission's approval to recover the filing and publication fees directly from the beneficiaries, as permitted under Regulation 94(1) of the Tariff Regulations 2024.

In the light of above submission and as per the Petition being filed by the Petitioner for determination of tariff of Feroze Gandhi Unchahar Thermal Power Station Stage-I (Unchahar-I)(420 MW) ,the Hon'ble Commission may please approve tariff for the tariff period 2024-29 as per provision of Regulation 9(2) of Tariff Regulations 2024.

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 of Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 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. Uttar Pradesh Power Corp. Ltd. (UPPCL) Shakti Bhawan 14, Ashok Marg Lucknow -226 001
2. Uttarakhand Power Corporation Ltd. (UPCL) Urja Bhavan Kanwali Road Dehradun -248 001 Gujrat

3. Tata Power Delhi Distribution Ltd. (TPDDL) Grid Substation, Hudson Road Kingsway Camp, Delhi-110009
4. BSES Rajdhani Power Ltd. (BRPL) BSES Bhawan, Nehru Place New Delhi-110019
5. BSES Yamuna Power Ltd. (BYPL) Shakti Kiran Building Karkardooma Delhi- 110092
6. Haryana Power Purchase Centre. (HPPC) Shakti Bhawan, Sector-VI, Panchkula, Haryana -134 109
7. Gujarat Urja Vikas Nigam Ltd.(GUVNL) Vidyut Bhavan, Race Course Vadodara – 390 007
8. Electricity Department (Chandigarh) Union Territory of Chandigarh Addl. Office Building, Sector-9 D Chandigarh
9. Power Development Department (PDD-J&K) Govt, of J&K , Civil Secretariat Srinagar

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 Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 MW (hereinafter referred to as Unchahar-I) is one such station located in the State of Uttar Pradesh (UP).The power generated from Unchahar-I is being supplied to the respondents herein mentioned above.

4) 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.

5) 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 Unchahar-I for the period from 01.04.2024 to 31.03.2029 as per the Tariff Regulations 2024.

6) The tariff of the Unchahar-I for the tariff period 1.4.2019 to 31.3.2024 was determined by the Hon'ble Commission vide order dated 07.10.2022 in Petition No. 431/GT/2020 in accordance with the CERC (Terms & Conditions of Tariff) Regulations 2019. The petitioner vide affidavit dated 16.11.2024 had filed a separate true up petition for the period 01.04.2019 to 31.03.2024 for revision of tariff in line with the applicable provisions of Tariff Regulations 2019.

7) It is submitted that Hon'ble Commission vide order dated 07.10.2022 in Petition No. 431/GT/2020 has allowed a capital cost of Rs 962.65 Cr. as on 31.03.2024 based on the admitted projected capital expenditure for the 2019-24 period. However, the actual closing capital cost as on 31.03.2024 has been worked out in the foresaid true-up petition as Rs. 963.77 Cr based on the actual expenditure after truing up exercise for the period 2019-24. Accordingly, the Petitioner has adjusted an amount of Rs. 1.12 Cr from the admitted capital cost as on 31.03.2024 and accordingly the opening capital cost as on 01.04.2024 has been considered as Rs 963.77 Cr. in the instant petition. The Hon'ble Commission may be pleased to accordingly adopt this adjustment in the admitted capital cost as on 31.3.2024 and determine the tariff in the present petition for the period 2024-29.

8) 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.

9) 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, rate of water charges as applicable for 2023-24 have been furnished below for reference. Water charges for the period 2024 – 29 is claimed based on the estimated expenses and same may be allowed in tariff based on the same. 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

Rate of Water Charges	Rs 12.48 per 1000 cubic feet
Rate of Royalty	Rs 6 Lakh per cusec per year
Total Water Charges(2023-24)	202.49 lacs

10) 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.

11) 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. To avoid the interest payment liability of the beneficiaries, it is prayed that the petitioner may be allowed to recover/ pass on the ash utilization charges on a monthly basis subject to true-up at the end of the 2024-29 period.

12) The petitioner humbly submits that petition no. 227/MP/2024 has been filed by the petitioner concerning Ash utilization 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.

13) 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 fuel 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 fuel also as per Form 15 of the Tariff Regulations, 2019.

14) However, in so far as the present Petition is concerned, the Petitioner has prepared & submitted the data of fuel 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 fuel 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 fuel for its existing plants month wise for the preceding 12 months i.e. for FY 2023-24 for computation of Interest on Working Capital.

15) 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 fuel as per the new format of Form-15.

16) 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.

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

18) The Petitioner further respectfully submits that the wage/ salary revision of the employees of the Petitioner will be due with effect from 1.1.2027. As per Regulation 36(1)(8) of the Tariff Regulations 2024, the impact on account of implementation of wage/ pay revision shall be allowed at the time of truing up of tariff. The Petitioner therefore craves liberty to approach the Hon'ble Commission for allowing the impact on account of implementation of wage/ pay revision of the employees of the Petitioner with effect from 1.1.2027, based on the actual payments whenever paid by it.

19) The present petition is filed on the basis of norms specified in the Tariff Regulations 2024. It is submitted that the petitioner is in the process of installing the Emission Control Systems (ECS) in compliance of the Revised Emission Standards as notified by MOEF vide notification dated 07.12.2015 as amended. Completion of these schemes in compliance of revised emission norms will affect the Station APC, Heat Rate, O&M expenses, water consumption etc. In addition the availability of the unit/ station would be also affected due to shutdown of the units for installation of ECS. The petitioner would be filing the details of the same in a separate petition in terms of the Regulation 29 of CERC (Terms& Conditions of Tariff) Regulations 2024.

20) 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.

21) 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/notices.

22) In accordance with the 'Conduct of Business Regulations 2023' of the Hon'ble Commission, the Petitioner shall 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 along with the prayer for recovery of Publication Expenses as per Regulation-94 of CERC Tariff Regulations 2024.

23) It is submitted that the Petitioner has already paid the requisite filing fee vide transaction id 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 recover filing fee and publication fee directly from the beneficiaries.

24) 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 31.3.2019 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 Unchahar-I 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 reimbursement of Ash utilization Charges directly from the beneficiaries on monthly basis, subject to true up.

iv) Allow the recovery of pay/wage revision as additional O&M over and above the normative O&M.

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

Petitioner

Noida

21-11-2024

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 Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 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: Uttar Pradesh Power Corp. Ltd. (UPPCL)
Shakti Bhawan
14, Ashok Marg
Lucknow – 226 001

And

Others

NOTARIAL NOTARIAL

AFFIDAVIT

I, Parimal Piyush, Son of Late Bharat Mishra, aged about 49 years, resident of IN1-2004, Inspire, Eldeco Aamantran, Sector-119, Noida (UP), 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 24 as mentioned in the Petition are true and correct based on my personal knowledge, belief and records maintained in the office.

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.

परिमल पीयूष/PARIMAL PIYUSH
अपर महाप्रबन्धक (वाणिज्यिक)
Addl. General Manager (Commercial)
एन टी पी सी लिमिटेड/NTPC LIMITED
EOC, A-8A, Sector-24, Noida-201301 (U.P.)

(Deponent)

Verification:

Verified at Noida on this 21ST 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)

परिमल पीयूष/PARIMAL PIYUSH
अपर महाप्रबन्धक (वाणिज्यिक)
Addl. General Manager (Commercial)
एन टी पी सी लिमिटेड/NTPC LIMITED
EOC, A-8A, Sector-24, Noida-201301 (U.P.)

NOTARY
YOGENDRA SINGH
GAUTAM BUDDHA NAGAR
REGN. NO.
OF INDIA

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

21 NOV 2024

TARIFF FILING FORMS (THERMAL)

FOR DETERMINATION OF TARIFF

FOR

Unchahar Stage-I

(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 Ash Transportation Expenses	✓
FORM-3C	Computation of Special Allowance	✓
FORM- 4	Details of Foreign loans	✓
FORM- 4A	Details of Foreign Equity	NA
FORM-5	Abstract of Admitted Capital Cost for the existing Projects	✓
FORM-5A	Abstract of Claimed Capital Cost for the existing Projects	✓
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	NA
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: Primary Fuel(Coal)	✓
FORM- 15A##	Details of Fuel for Computation of Energy Charges: Secondary Fuel(Oil)	✓
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

***** 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	✓
FORM-M	Statement of Capital Woks in Progress	✓
FORM-N	Calculation of Interest on Normative Loan	✓
FORM-O	Calculation of Interest on Working Capital	✓
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	***
FORM-T	Summary of issues involved in the petition	✓
***** Shall be provided at the time of true up**		

List of supporting documents for tariff filing for Thermal Stations

S. No.	Information / Document	Tick
1	Certificate of incorporation, Certificate for Commencement of Business, Memorandum of Association, & Articles of Association (For New Station setup by a company making tariff application for the first time to CERC)	NA
2	A. Station wise and Corporate audited Balance Sheet and Profit & Loss Accounts with all the Schedules & annexures on COD of the Station for the new station & for the relevant years.	NA
	B. Station wise and Corporate audited Balance Sheet and Profit & Loss Accounts with all the Schedules & annexures for the existing station for relevant years.	***
3	Copies of relevant loan Agreements	NA
4	Copies of the approval of Competent Authority for the Capital Cost and Financial package.	NA
5	Copies of the Equity participation agreements and necessary approval for the foreign equity.	NA
6	Copies of the BPSA/PPA with the beneficiaries, if any	NA
7	Detailed note giving reasons of cost and time over run, if applicable.	NA
	List of supporting documents to be submitted:	
	a. Detailed Project Report	
	b. CPM Analysis	
	c. PERT Chart and Bar Chart	
	d. Justification for cost and time Overrun	
8	Generating Company shall submit copy of Cost Audit Report along with cost accounting records, cost details, statements, schedules etc. for the Generating Unit wise /stage wise/Station wise/ and subsequently consolidated at Company level as submitted to the Govt. of India for first two years i.e. 2019-20 and 2020-21 at the time of mid-term true-up in 2021-22 and for balance period of tariff period 2019-24 at the time of final true-up in 2024-25. In case of initial tariff filing the latest available Cost Audit Report should be furnished.	***
9	Any other relevant information, (Please specify)	NA
10	Reconciliation with Balance sheet of any actual additional capitalization and amongst stages of a generating station	***
11	BBMB is maintaining the records as per the relevant applicable Acts. Formats specified herein may not be suitable to the available information with BBMB. BBMB may modify the formats suitably as per available information to them for submission of required information for tariff purpose.	NA

PART-I
FORM- 1

Summary of Tariff

	Name of the Petitioner:	**NTPC Limited**
	Name of the Generating Station:	**Unchahar Stage-I**
	Place (Region/District/State):	**Northern Region /Raibareli / Uttar Pradesh**

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	379.56	580.18	39.60	933.71	2,127.11	1,863.95
1.2	Interest on Loan	Rs Lakh	7.33	7.13	0.85	19.35	28.76	10.27
1.3	Return on Equity	Rs Lakh	5,421.76	5,430.48	5,432.96	5,489.91	5,618.29	5,728.03
1.4	Interest on Working Capital	Rs Lakh	5,388.30	5,022.42	5,051.50	5,110.40	5,176.11	5,225.14
1.5	O&M Expenses	Rs Lakh	19,258.32	21054.74	21811.95	22717.53	23680.82	24702.37
1.6	Special Allowance (If applicable)	Rs Lakh	3,990.00	4515.00	4515.00	4515.00	4515.00	4515.00
	Total	Rs Lakh	**34445.27**	**36609.94**	**36851.86**	**38785.90**	**41146.08**	**42044.75**
2	Primary Fuel							
2.1	Landed Fuel Cost (coal/gas/RLNG/ liquid) as per FSA approved by beneficiaries	Rs/Ton	4567.51	4737.91				
	(%) of Fuel Quantity	(%)	83.4%	81.5%				
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 as per FSA approved by beneficiaries	Rs/Ton	-	-				
	(%) of Fuel Quantity	(%)	-	-				
2.4	Landed Fuel Cost (coal/gas /RLNG/liquid) other than FSA	Rs/Ton	-	-				
	(%) of Fuel Quantity	(%)	-	-				
2.5	Landed Fuel Cost Imported Coal other than FSA.	Rs/Ton	19299.69	14224.32				
	(%) of Fuel Quantity	(%)	16.6%	18.5%				
3	Secondary Fuel	Rs./kL	78,489.16	81596.96				
	Energy Charge Rate ex-bus (Paise/kWh) -Coal	Rs/Unit	4.85	4.41				
	Energy Charge Rate ex-bus (Paise/kWh) -Oil	Rs/Unit	0.04	0.04				
	Energy Charge Rate ex-bus (Paise/kWh) - Total	Rs/Unit	4.89	4.46				

(Petitioner)

PART-I
FORM- 1(I)

	Name of the Petitioner:	NTPC Limited
	Name of the Generating Station:	Unchahar Stage-I

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	96,377.39	96,377.39	96,465.39	98,452.29	1,01,192.29
2	Add: Addition during the year/period	-	88.00	1,986.90	2,740.00	1,402.10
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	96,377.39	96,465.39	98,452.29	1,01,192.29	1,02,594.39
7	**Average Capital Cost**	**96,377.39**	**96,421.39**	**97,458.84**	**99,822.29**	**1,01,893.34**

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	96377.39	96377.39	96465.39	98205.39	100405.39
2	Add: Addition during the year / period	0.00	88.00	1740.00	2200.00	800.00
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	96377.39	96465.39	98205.39	100405.39	101205.39
7	**Average Capital Cost**	**96377.39**	**96421.39**	**97335.39**	**99305.39**	**100805.39**

Statement showing claimed capital cost eligible for RoE at one year MCLR + 350 bps subject to ceiling of 14.00% (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	0.00	0.00	246.90	786.90
2	Add: Addition during the year / period	0.00	0.00	246.90	540.00	602.10
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	0.00	0.00	246.90	786.90	1389.00
7	**Average Capital Cost**	**0.00**	**0.00**	**123.45**	**516.90**	**1087.95**

(Petitioner)

PART-I

FORM- 1(IIA)

	Name of the Petitioner:	**NTPC Limited**
	Name of the Generating Station:	**Unchahar Stage-I**

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)	47,696.79	47,696.79	47,723.19	48,245.19	48,905.19
2	Less: Adjustment in Opening Equity	18,783.57	18,783.57	18,783.57	18,783.57	18,783.57
3	Adjustment during the year					
4	Net Opening Equity (Normal)	28,913.22	28,913.22	28,939.62	29,461.62	30,121.62
5	Add: Increase in equity due to addition during the year / period	0.00	26.40	522.00	660.00	240.00
7	Less: Decrease due to De-capitalisation during the year / perio	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)	28,913.22	28,939.62	29,461.62	30,121.62	30,361.62
11	Average Equity (Normal)	28,913.22	28,926.42	29,200.62	29,791.62	30,241.62
12	Rate of ROE (%)	18.782	18.782	18.782	18.782	18.782
13	Total ROE	**5,430.48**	**5,432.96**	**5,484.46**	**5,595.46**	**5,679.98**

(Petitioner)

PART-I

FORM- 1(IIB)

	Name of the Petitioner:	**NTPC Limited**					
	Name of the Generating Station:	**Unchahar Stage-I**					
	Statement showing Return on Equity linked to SBI MCLR+ 350 basis points						
							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 linked to SBI MCLR+ 350 basis points						
1	Gross Opening Equity (Normal)	0.00	0.00	0.00	74.07	236.07	
2	Less: Adjustment in Opening Equity	0.00	0.00	0.00	0.00	0.00	
3	Adjustment during the year						
4	Net Opening Equity (Normal)	0.00	0.00	0.00	74.07	236.07	
5	Add: Increase in equity due to addition during the year / period	0.00	0.00	74.07	162.00	180.63	
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)	0.00	0.00	74.07	236.07	416.70	
11	Average Equity (Normal)	0.00	0.00	37.04	155.07	326.39	
12A	Rate of ROE- Base Rate(%)	12.150	12.150	12.150	12.150	12.150	
12B	Effective Tax Rate (%)	17.472	17.472	17.472	17.472	17.472	
12C	Rate of ROE(Grossed Up) (%)	14.722	14.722	14.722	14.722	14.722	
13	Total ROE	**0.00**	**0.00**	**5.45**	**22.83**	**48.05**	

(Petitioner)

PART-I
FORM-2

Plant Characteristics

Name of the Petitioner	**NTPC Limited**	
Name of the Generating Station	**Unchahar Stage-I**	
Unit(s)/Block(s)/Parameters	**Unit-1**	**Unit-2**
Installed Capacity (MW)	210	210
Schedule COD as per Investment Approval		
Actual COD /Date of Taken Over (as applicable)	13.02.1992	
Pit Head or Non Pit Head or Integrated Mine	Non Pit Head	
Name of the Boiler Manufacture	BHEL	
Name of Turbine Generator Manufacture		
Main Steams Pressure at Turbine inlet (kg/Cm^2) abs.		
Main Steam Temperature at Turbine inlet (^0C)		
Reheat Steam Pressure at Turbine inlet (kg/Cm^2)		
Reheat Steam Temperature at Turbine inlet (^0C)		
Main Steam flow at Turbine inlet under MCR condition (tons /hr)		
Main Steam flow at Turbine inlet under VWO condition (tons /hr)		
Unit Gross electrical output under MCR /Rated condition (MW)		
Unit Gross electrical output under VWO condition (MW)		
Guaranteed Design Gross Turbine Cycle Heat Rate (kCal/kWh)		
Conditions on which design turbine cycle heat rate guaranteed		
% MCR		
% Makeup Water Consumption	NA	
Design Capacity of Make up Water System		
Design Capacity of Inlet Cooling System		
Design Cooling Water Temperature (^0C)		
Back Pressure		
Steam flow at super heater outlet under BMCR condition (tons/hr)		
Steam Pressure at super heater outlet under		
BMCR condition) **(kg/Cm^2)**		
Steam Temperature at super heater outlet under		
BMCR condition (^0C)		
Steam Temperature at Reheater outlet at BMCR condition (^0C)		
Design / Guaranteed Boiler Efficiency (%)		
Design Fuel with and without Blending of domestic/imported coal		
Type of Cooling Tower	Induced draught type Cooling tower	
Type of cooling system	Closed Cycle	
Type of Boiler Feed Pump	MDBFP	
Type of Boiler (Wall Fired/Tangential Fired)	Tangential Fired	
Fuel Details[7]		
-Primary Fuel	COAL	
-Secondary Fuel	LDO	
-Alternate Fuels		
Special Features/Site Specific Features		
Special Technological Features		
Environmental Regulation related features	ESP	
Any other special features	FGD implementation is in process.	

Petitioner

PART-I
FORM- 3

Normative parameters considered for tariff computations

Name of the Petitioner:	**NTPC Limited**
Name of the Generating Station:	**Unchahar Stage-I**

(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 Rate of Return on Add - cap beyond the original scope of work including additional capitalization due to Change in Law, Force Majeure	%	8.765	12.150	12.150	12.150	12.150	12.150
Effective Tax Rate	%	17.4720	17.4720	17.4720	17.4720	17.4720	17.4720
Target Availability	%	85.00	83.00	83.00	83.00	83.00	83.00
Peak Hours	%	85.00	83.00	83.00	83.00	83.00	83.00
Off-Peak Hours	%	85.00	83.00	83.00	83.00	83.00	83.00
& Average Monthly Frequency Response Performance	0-1	NA	Will be provided at the time of truing up				
Auxillary Energy Consumption	%	9.00	9.00	9.00	9.00	9.00	9.00
Gross Station Heat Rate	kCal/kWh	2430.00	2415.00	2415.00	2415.00	2415.00	2415.00
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	NA	NA	NA	NA	NA	NA
Liquid Fuel Stock for WC2	in Months	NA	NA	NA	NA	NA	NA
O&M Expenses	Rs lakh/MW	37.84	40.92	43.07	45.33	47.71	50.21
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**	Lakh MT	6.5	6.5	6.5	6.5	6.5	6.5
SBI 1 Year MCLR plus 325 basis point3	%	12.00	11.90	11.90	11.90	11.90	11.90
Blending ratio of domestic coal/imported coal		NA	NA	NA	NA	NA	NA
Norms for consumption of reagent		NA	NA	NA	NA	NA	NA
Specific Limestone consumption for Wet Limestone FGD		FGD is yet to be Commissioned.					
Specific Limestone consumption for Lime Spray Dryer or Semi-dry FGD		NA	NA	NA	NA	NA	NA
Specific consumption of sodium bicarbonate		NA	NA	NA	NA	NA	NA
Specific Limestone consumption for CFBC based generating station		NA	NA	NA	NA	NA	NA
Specific urea consumption of the SNCR		NA	NA	NA	NA	NA	NA
Specific ammonia consumption of the SCR		NA	NA	NA	NA	NA	NA
Transit and Handling Losses of coal or lignite, as applicable	%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%

****Combined storage capacity of Unchahar Station**

Petitioner

Part-I
FORM-3A
ADDITIONAL FORM

Calculation of O&M Expenses

Name of the Company :	NTPC Limited
Name of the Power Station :	Unchahar Stage-I

Amount in Rs. Lakhs

S.No.	Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	7	8
1	**O&M expenses under Reg.36(1)**					
1a	Normative	17186.40	18089.40	19038.60	20038.20	21088.20
2	**O&M expenses under Reg.36(1)(6)**					
2a	Water Charges	134.94	134.94	134.94	134.94	134.94
2b	Secutiry expenses	1063.82	1148.90	1240.76	1339.94	1446.97
2c	Capital Spares	Shall be provided at the time of truing up				
3	O&M expenses-Ash Transportation	2669.57	2438.71	2303.23	2167.74	2032.26
	Total O&M Expenses	**21054.74**	**21811.95**	**22717.53**	**23680.82**	**24702.37**

Petitioner

PART-I
FORM-3B
Additional Form

Computation of Special Allowance

Name of the Company :				NTPC Limited					
Name of the Power Station :				Unchahar Stage-I					
Rate of Special allowance @lakh/MW/year					10.75				
									(Rs. Lakh)
Unit No.	Capacity (MW)	Date of COD	Year of completion of useful life of 25 yrs.		Special Allowance as per Clause 28				
				Existing 2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
1	210	21-Nov-88	2013-14	1,995	2,258	2,258	2,258	2,258	2,258
2	210	22-Mar-89	2013-14	1,995	2,258	2,258	2,258	2,258	2,258
Year wise Total for the Station				**3,990**	**4,515**	**4,515**	**4,515**	**4,515**	**4,515**

Petitioner

Form-4

PART 1
FORM- 4

DETAILS OF FOREIGN LOANS
(Details only in respect of loans applicable to the project under petition)

Name of the company: NTPC LIMITED
Name of the Power Station:

Exchange Rate as on	31-03-2019	USD = Rs.	69.77	EUR = Rs.	78.64	JPY = Rs.	0.6343
Exchange Rate as on	31-03-2020	USD = Rs.	76.06	EUR = Rs.	84.43	JPY = Rs.	0.7069
Exchange Rate as on	31-03-2021	USD = Rs.	74.06	EUR = Rs.	87.28	JPY = Rs.	0.6730
Exchange Rate as on	31-03-2022	USD = Rs.	79.33	EUR = Rs.	85.76	JPY = Rs.	0.6280
Exchange Rate as on	31-03-2023	USD = Rs.	82.74	EUR = Rs.	90.67	JPY = Rs.	0.6263
Exchange Rate as on	31-03-2024	USD = Rs.	83.95	EUR = Rs.	91.51	JPY = Rs.	0.5576

4.84% (Amount in Lacs) (Amount in Lacs) (Amount in Lacs) (Amount in Lacs)

Financial Year (Starting from COD)	2019-20 (01.04.2019 to 31.03.2020)				2020-21 (01.04.2020 to 31.03.2021)				2021-22 (01.04.2021 to 31.03.2022)				2022-23 (01.04.2022 to 31.03.2023)				2023-24 (01.04.2023 to 31.03.2024)			
1	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
KfW -ESP	Date	Amount (FC)	Ex. Rate	Amount (INR)	Date	Amount (FC)	Ex. Rate	Amount (INR)	Date	Amount (FC	Ex. Rate	Amount (INR)	Date	Amount (FC	Ex. Rate	Amount (INR)	Date	Amount (FC	Ex. Rate	Amount (INR)
Currency 1 EURO	15-03-2019																			
At the date of draw	01-04-2019	45.96	78.64	3,623.47	01-04-2020	45.96	84.43	3,880.36	01-04-2021	45.96	87.28	4,011.37	01-04-2022	45.96	85.76	3,941.31	01-04-2023	45.96	90.67	4,166.36
Loan repayment upto previous period		11.49	78.64	905.87		17.23				22.98				28.72				34.47		
Net loan at the Beginning of the period	01-04-2019	34.47	78.64	2,717.60	01-04-2020	28.72	84.43	2,425.24	01-04-2021	22.98	87.28	2,005.68	01-04-2022	17.23	85.76	1,478.07	01-04-2023	11.49	90.67	1,044.09
Schedule repayment date of principal	15-09-2019	2.87	78.50	226.78	15-09-2020	2.87	86.97	249.82	15-09-2021	2.87	86.90	249.63	15-09-2022	2.87	80.34	230.78	15-09-2023	2.87	89.05	255.61
Scheduled payment date of interest	15-09-2019	0.55	78.50	43.21	15-09-2020	0.46	86.97	39.86	15-09-2021	0.37	86.90	31.85	15-09-2022	0.27	80.34	22.09	15-09-2023	0.18	89.05	16.32
Withholding tax including surcharge on Interest	15-09-2019	-		-	15-09-2020	-	0.00	-	15-09-2021	-	0.00	-	15-09-2022	-	0.00	-	15-09-2023	-	0.00	-
Schedule repayment date of principal	15-03-2020	2.87	83.77	240.61	15-03-2021	2.87	86.71	248.97	15-03-2022	2.87	84.01	241.30	15-03-2023	2.87	87.76	252.16	15-03-2024	2.87	90.47	259.87
Scheduled payment date of Interest	15-03-2020	0.50	83.77	42.22	15-03-2021	0.41	86.71	35.75	15-03-2022	0.32	84.01	26.84	15-03-2023	0.23	87.76	20.11	15-03-2024	0.14	90.57	12.45
Withholding tax including surcharge on Interest	15-03-2020	-		-	15-03-2021	-	0.00	-	15-03-2022	-	0.00	-	15-03-2023	-	0.00	-	15-03-2024	-	0.00	-
ERV	31-03-2020			174.04	31-03-2021			78.33	31-03-2022			-35.68	31-03-2023			48.96	31-03-2024			-2.68
At the end of Financial year	31-03-2020	28.72	84.43	2,425.24	31-03-2021	22.98	87.28	2,005.68	31-03-2022	17.23	85.76	1,478.07	31-03-2023	11.49	90.87	1,044.09	31-03-2024	5.74	91.51	525.73

PART 1
FORM- 5

Abstract of Admitted Capital Cost for the existing Projects

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Unchahar Stage-I**

Last date of order of Commission for the project	**Date (DD-MM-YYYY)**	07-10-2022
Reference of petition no. in which the above order was passed	**Petition no.**	431/GT/2020

Following details (whether admitted and /or considered) as on the last date of the period **i.e. 31.03.2024** for which tariff is approved, in the above order by the Commission:

Capital cost	**(Rs. in lakh)**	96,265.33
Amount of un-discharged liabilities included in above (& forming part of admitted capital cost)		-
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		48,602.17
Cumulative Repayment		48,602.17
Net Normative Debt		-
Gross Notional Equity		47,663.17
Adjustment to equity in terms of 1st proviso to Regulation 18(3)		18783.57
Normative Equity		28879.6
Cumulative Depreciation		86,381.11
Freehold land		357.18

(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 :	**Unchahar Stage-I**

Reference of Final True-up Tariff Petition	**Affidavit dated**	16-11-2024
Capital Cost as on 31.03.2024/01.04.2024 as per Hon'ble Commission's Order dated 07.10.2022 in 431/GT/2020	**Rs. Lakhs**	96,265.33
Adjustment as per this petition		112.06
Following details as considered by the Petitioner as **on the First date of the period i.e. 01.04.2024** for which tariff is claimed:		
Capital cost as on 01.04.2024	**(Rs. in lakh)***	96377.39
Amount of un-discharged liabilities included in above (& forming part of admitted capital cost)		0
Amount of un-discharged liabilities corresponding to above admitted capital cost (but not forming part of admitted capital cost being allowed on cash basis)		82.86
Gross Normative Debt		48,680.60
Cumulative Repayment		48,497.22
Net Normative Debt		183.39
Gross Notional Equity		47,696.79
Adjustment to equity in terms of 1st proviso to Regulation 18(3)		18,783.57
Normative Equity		28,913.22
Cumulative Depreciation		85,867.94
Freehold land		357.08

(Petitioner)

Statement Giving Details of Project Financed through a Combination of loan

Form 8

TRANCHE NO

BP NO 5050000261	**T00001**	**D00012**
Unsecured Loan From SBI-VII		
Source of Loan :	**SBI-VII**	
Currency :	INR	
Amount of Loan :	1,00,00,00,00,000	
Total Drawn amount :	2,50,00,00,000	
Date of Drawl	22.07.2013	
Interest Type :	Floating	
Rate of Interest as on 01.04.2019	8.25%	
Upfront fees	0.08% excluding service tax	
Margin, If Floating Interest :	Nil	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	Monthly	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	4 Years	
Moratorium effective from :	08.07.2011	
Repayment Period (Inc Moratorium) :	12 Years	
Repayment Frequency :	16 Half Yearly Instalments	
Repayment Type :	AVG	
First Repayment Date :	30.09.2015	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	BARH-II	67,00,00,000
	FARAKKA-III	35,00,00,000
	SIMHADRI-II	20,00,00,000
	RAMAGUNDAM SOLAR	10,00,00,000
	FGUTPS-I	8,40,09,477
	FGUTPS-II	5,59,90,523
	VSTPS R&M	28,00,00,000
	RAMAGUNDAM-R&M	18,00,00,000
	KORBA-R&M	17,00,00,000
	KAWAS-R&M	17,00,00,000
	BADARPUR-R&M	14,00,00,000
	TSTPP-R&M	10,00,00,000
Total Allocated Amount		**2,50,00,00,000.00**

Statement Giving Details of Project Financed through a Combination of loan

Form 8

TRANCHE NO

BP NO 5050000442 **T00001** **18**

Unsecured Loan From SBI-VIII		
Source of Loan :	**SBI-VIII**	
Currency :	INR	
Amount of Loan :	1,00,00,00,00,000	
Total Drawn amount :	1,50,00,00,000	
Date of Drawl	21.04.2016	
Interest Type :	Floating	
Fixed Interest Rate :	----------	
Base Rate, If Floating Interest	D00018-8.25%	
Margin, If Floating Interest :	0.00%	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	Monthly	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	6 Years	
Moratorium effective from :	21.04.2016	
Repayment Period (Inc Moratorium) :	15 Years	
Repayment Frequency :	9 Yearly Installments	
Repayment Type :	AVG	
First Repayment Date :	31.01.2022	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	**Project Name**	**Amount**
	BONGAIGAON	70,00,00,000
	UNCHAHAR-IV	5,00,00,000
	RAMAGUNDAM R&M	15,00,00,000
	TSTPS R&M	21,00,00,000
	GANDHAR R&M	8,00,00,000
	KORBA R&M	6,00,00,000
	DADRI GAS R&M	10,00,00,000
	UNCHAHAR R&M	5,00,00,000
	BADARPUR R&M	5,00,00,000
	KAHALGAON R&M	5,00,00,000
Total Allocated Amount		**1,50,00,00,000**

Statement Giving Details of Project Financed through a Combination of loan

Form 8

TRANCHE NO

BP NO 5050000521 **T00001** **D00004**

Unsecured Loan From HDFC Bank Ltd.-IV		
Source of Loan :	**HDFC Bank Ltd.-IV**	
Currency :	INR	
Amount of Loan :	20,00,00,00,000	
Total Drawn amount :	12,45,00,00,000	
Date of drawl	29.06.2018	
Interest Type :	Floating	
Fixed Interest Rate :		
Base Rate, If Floating Interest	8.45%	
Margin, If Floating Interest :	NIL	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	MONTHLY	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	3 Years	
Moratorium effective from :	29.06.2018	
Repayment Period (Inc Moratorium) :	12 Years	
Repayment Frequency :	9 Yearly Instalment	
Repayment Type :	AVG	
First Repayment Date :	17.04.2021	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	KORBA R&M	90,00,00,000
	RAMAGUNDAM R&M	2,20,00,00,000
	UNCHAHAR R&M	70,00,00,000
	RIHAND R&M	90,00,00,000
	KAWAS R&M	1,80,00,00,000
	AURAIYA R&M	1,80,00,00,000
	TSTPP R&M	90,00,00,000
	GANDHAR R&M	1,85,00,00,000
	NCTPP R&M	30,00,00,000
	KAHALGAON R&M	30,00,00,000
	ANTA R&M	80,00,00,000
Total Allocated Amount		**12,45,00,00,000**

Statement Giving Details of Project Financed through a Combination of loan

Form 8

TRANCHE NO

BP NO 5050000791	**T00001**	**D00003**

Unsecured Loan From HDFC Bank Ltd. VII		
Source of Loan :	**HDFC Bank Ltd. VII**	
Currency :	INR	
Amount of Loan :	25.00,00,00,000	
Total Drawn amount :	1,70,00,00,000	
Date of drawl	01.01.2020	
Interest Type :	Floating	
Fixed Interest Rate :		
Base Rate, If Floating Interest	7.65%	
Margin, If Floating Interest :	NIL	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	MONTHLY	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	6 Years	
Moratorium effective from :	01.01.2020	
Repayment Period (Inc Moratorium) :	15 Years	
Repayment Frequency :	9 Yearly Instalment	
Repayment Type :	AVG	
First Repayment Date :	11.06.2026	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	KORBA R&M	20,00,00,000
	RAMAGUNDAM R&M	40,00,00,000
	VINDHYACHAL R&M	40,00,00,000
	FARAKKA R&M	30,00,00,000
	UNCHAHAR R&M	10,00,00,000
	RIHAND R&M	10,00,00,000
	TSTPP R&M	10,00,00,000
	KAHALGAON R&M	10,00,00,000
Total Allocated Amount		**1,70,00,00,000**

Form 8

TRANCHE NO

BP NO 5050001151 **T00001** **D00002**

Unsecured Loan From HDFC Bank Ltd. X		
Source of Loan :	**HDFC Bank Ltd. X**	
Currency :	INR	
Amount of Loan :	30,00,00,00,000	
Total Drawn amount :	5,00,00,00,000	
Date of drawl	24.11.2021	
Interest Type :	Floating	
Fixed Interest Rate :		
Base Rate, If Floating Interest	5.83%	
Margin, If Floating Interest :	NIL	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	MONTHLY	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	3 Years	
Moratorium effective from :	24.11.2021	
Repayment Period (Inc Moratorium) :	12 Years	
Repayment Frequency :	12 Yearly Instalment	
Repayment Type :	AVG	
First Repayment Date :	24.11.2025	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	NORTH KARANPURA	24,00,00,000
	RAMMAM	3,00,00,000
	TELANGANA	23,00,00,000
	LARA	50,00,00,000
	GADARWARA	50,00,00,000
	DARLIPALLI	77,00,00,000
	TANDA-II	65,00,00,000
	BARAUNI-II	20,00,00,000
	SINGRAULI R&M	15,00,00,000
	KORBA R&M	25,00,00,000
	RAMAGUNDAM I & II R&M	40,00,00,000

	VINDHYACHAL R&M	7,00,00,000
	FARAKKA R&M	10,00,00,000
	UNCHAHAR R&M	4,00,00,000
	RIHAND R&M	15,00,00,000
	KAHALGAON R&M	3,00,00,000
	CHATTI BARIATU CMB	5,00,00,000
	DULANGA COAL MINE	26,00,00,000
	TALAIPALI COAL MINE	26,00,00,000
	KIRENDARI	3,00,00,000
	BARH-II FGD	2,50,00,000
	MOUDA-II FGD	6,50,00,000
Total Allocated Amount		**5,00,00,00,000**

TRANCHE NO

BP NO 5050000981 **T00001** **D00008**

Unsecured Loan From HDFC Bank Ltd. IX		
Source of Loan :	**HDFC Bank Ltd. IX**	
Currency :	INR	
Amount of Loan :	50,00,00,00,000	
Total Drawn amount :	5,00,00,00,000	
Date of drawl	18.11.2020	
Interest Type :	Floating	
Fixed Interest Rate :		
Base Rate, If Floating Interest	5.95%	
Margin, If Floating Interest :	NIL	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	MONTHLY	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	3 Years	
Moratorium effective from :	18.11.2020	
Repayment Period (Inc Moratorium) :	12 Years	
Repayment Frequency :	12 Yearly Instalment	
Repayment Type :	AVG	
First Repayment Date :	30.06.2024	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	BARH I	1,75,00,00,000
	BARAUNI-II	25,00,00,000
	SOLAPUR	20,00,00,000
	TTPS R&M	1,00,00,000
	SINGRAULI R&M	15,00,00,000
	KORBA R&M	15,00,00,000
	RAMAGUNDAM I & II R&M	43,50,00,000

	VINDHYACHAL R&M	18,00,00,000
	FARAKKA R&M	12,00,00,000
	UNCHAHAR R&M	16,00,00,000
	RIHAND R&M	16,00,00,000
	FARIDABAD R&M	1,50,00,000
	DADRI GAS R&M	3,00,00,000
	TSTPP R&M	11,50,00,000
	KAHALGAON R&M	16,00,00,000
	SIMHADRI R&M	1,50,00,000
	CHATTI BARIATU CMB	25,00,00,000
	TALAIPALI COAL MINE	75,00,00,000
	KIRENDARI	10,00,00,000
Total Allocated Amount		**5,00,00,00,000**

Statement Giving Details of Project Financed through a Combination of loan

Form 8

TRANCHE NO

BP NO 5050000571	**T00001**	**D00003**
Unsecured Loan From Punjab National Bank-III		
Source of Loan :	**Punjab National Bank-III**	
Currency :	INR	
Amount of Loan :	20.00,00,00,000	
Total Drawn amount :	5,00,00,00,000	
Date of Drawl	13.08.2018	
Interest Type :	Floating	
Fixed Interest Rate :		
Base Rate, If Floating Interest	8.30%	
Margin, If Floating Interest :	0.00%	
Are there any Caps/ Floor :	Y/N	
Frequency of Intt. Payment	MONTHLY	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	3 Years	
Moratorium effective from :	13.08.2018	
Repayment Period (Inc Moratorium) :	12 Years	
Repayment Frequency :	9 Yearly Instalment	
Repayment Type :	AVG	
First Repayment Date :	01.02.2022	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	BARH-I	30,00,00,000.00
	SOLAPUR	20,00,00,000.00
	TANDA-II	20,00,00,000.00
	TALLAIPALLI	50,00,00,000.00
	SINGRAULI R&M	80,00,00,000.00
	FARAKKA R&M	80,00,00,000.00
	RIHAND R&M	50,00,00,000.00
	DADRI GAS R&M	40,00,00,000.00
	KORBA R&M	40,00,00,000.00
	RAMAGUNDAM R&M	40,00,00,000.00
	VINDHAYACHAL R&M	30,00,00,000.00
	UNCHAHAR R&M	20,00,00,000.00
Total Allocated Amount		**5,00,00,00,000.00**

Statement Giving Details of Project Financed through a Combination of loan
Form 8

BP NO 5970000011

TRANCHE NO
T00031

Unsecured Loan From PFC-V		
Source of Loan :	PFC-V	
Currency :	INR	
Amount of Loan :	1,00,00,00,00,000	
Total Drawn amount :	1,00,00,00,00,000	
Interest Type :	Fixed with Reset after every 3 Years	
Fixed Interest Rate :	----------	
Base Rate, If Floating Interest :	D00001 - 8.85%/D00002 - 8.52%/D00003 - 7.48%/D00004 -	
Margin, If Floating Interest :	D00001 - D00008 - 0.45%	
Are there any Caps/ Floor :	YES	
Frequency of Intt. Payment :	Monthly	
If Above is yes, specify Caps/ Floor :		
Moratorium Period :	4 Years	
Moratorium effective from :	20.12.2008	
Repayment Period (Inc Moratorium) :	18 Years	
Repayment Frequency :	48 Quarterly Instalments	
Repayment Type :	FIFO	
First Repayment Date :	15.07.2013	
Base Exchange Rate :	RUPEE	
Date of Base Exchange Rate :	N.A.	
Project Code	Project Name	Amount
	KOLDAM	6,43,00,00,000.00
	SIMHADRI-II	11,92,00,00,000.00
	KAHALGAON-II	98,00,00,000.00
	KORBA-III	4,59,00,00,000.00
	FARAKKA-III	6,64,00,00,000.00
	LOHARINAG-PALA	10,00,00,000.00
	TAPOVAN	2,99,00,00,000.00
	MAUDA-I	8,25,00,00,000.00
	NCTPP-II	6,44,00,00,000.00
	VINDHYACHAL-IV	8,68,00,00,000.00
	BONGAIGAON	8,77,00,00,000.00
	RIHAND-III	5,64,00,00,000.00
	BARH-II	9,75,00,00,000.00
	SIPAT-I	5,35,00,00,000.00
	TALCHER STPP-II	64,00,00,000.00
	RIHAND-II	15,00,00,000.00
	VINDHYACHAL III	50,00,00,000.00
	UNCHAHAR-III	20,00,00,000.00
	PAKRI BARWADIH	1,48,00,00,000.00
	BARH-I	6,00,00,00,000.00
	TTPS R&M	35,00,00,000.00
	TANDA R&M	15,00,00,000.00
	KORBA R&M	15,00,00,000.00
	SIPAT-II	9,00,00,000.00
	BADARPUR R&M	30,00,00,000.00
	RIHAND R&M	7,00,00,000.00
	UNCHAHAR R&M	5,00,00,000.00
Total Allocated Amount		1,00,00,00,00,000.00

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INTEREST RATE MOVEMENT FY 2019-20

BANK	RATE OF INTEREST	From	To	Number of Days	Product	Weighted Average Rate of Interest
State Bank of India - VIII	8.00%	01-Apr-23	13-May-23	43	3.44	
State Bank of India - VIII	8.10%	14-May-23	13-Aug-23	92	7.45	
State Bank of India - VIII	8.15%	14-Aug-23	13-Feb-24	184	15.00	
State Bank of India - VIII	8.20%	14-Feb-24	31-Mar-24	47	3.85	
				366	**29.74**	**8.1262%**
HDFC Bank Limited-IV	8.01%	01-Apr-23	31-May-23	61	4.89	
HDFC Bank Limited-IV	7.95%	01-Jun-23	31-Mar-24	305	24.25	
				366	**29.13**	**7.9600%**
HDFC Bank Limited-VII	8.01%	01-Apr-23	31-May-23	61	4.89	
HDFC Bank Limited-VII	7.95%	01-Jun-23	31-Mar-24	305	24.25	
				366	**29.13**	**7.9600%**
HDFC-IX	8.01%	01-Apr-23	31-May-23	61	4.89	
HDFC-IX	7.95%	01-Jun-23	31-Mar-24	305	24.25	
				366	**29.13**	**7.9600%**
HDFC-X	8.01%	01-Apr-23	31-May-23	61	4.89	
HDFC-X	7.95%	01-Jun-23	31-Mar-24	305	24.25	
				366	**29.13**	**7.9600%**
Punjab National Bank III	7.90%	01-Apr-23	31-Mar-24	366	28.91	
				366	**28.91**	**7.9000%**

KFW ESP Loan

Particulars							
Source of Loan	KfW ESP IV	KfW ESP VI	KfW ESP VIII	KfW ESP IX	KfW ESP XI	KfW ESP XII	KfW ESP XIII
Drawal	50,00,000.00	50,00,000.00	1,00,00,000.00	1,00,00,000.00	50,00,000.00	50,00,000.00	50,00,000.00
Currency	EUR	EUR	EUR	EUR	EUR	EUR	EUR
Amount of loan sanctioned							
Amount of Grcss Loan drawn upto 31.03.2019							
Interest Type	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
Fixed Interest Rate, if applicable	3.19%	3.19%	3.19%	3.19%	3.19%	3.19%	3.19%
Base Rate, if floating interest	-	-	-	-	-	-	-
Margin, if floating interest rate	-	-	-	-	-	-	-
Are there any Caps / Floor	NO	NO	NO	NO	NO	NO	NO
If above is Yes, specify Caps / Floor	-	-	-	-	-	-	-
Moratorium Period	Years 2½ Month	Years 2½ Month	4 Years 2½ Months	4 Years 2½ Months	Years 2½ Month	Years 2½ Month	Years 2½ Month
Moratorium effective from							
Repayment period	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)	Repayment in 8 Years (16 semi-annual instalments)
Repayment effective from	15.09.2017	15.09.2017	15.09.2017	15.09.2017	15.09.2017	15.09.2017	15.09.2017
Repayment frequency							
Repayment installment							
Base Exchange Rate (31.03.2019)							
Are foreign currency loan hedged							
If above is Yes, specify details	NO	NO	NO	NO	NO	NO	NO
Drawl Date	22.09.14	19.03.15	20.04.15	17.08.15	09.02.16	04.04.16	03.05.16
Drawl Exchange Rate	78.12310	66.55000	67.34541	72.34003	76.51337	75.28750	76.90000
Name of the Projects							
Anantpur Solar							
Farakka ESP			13.94230%	12.19552%	13.31480%	5.42780%	10.90220%
Korba STPS- ESP	32.39505%	32.61145%	5.12210%	10.57396%	21.68810%	34.43650%	15.52040%
Rihand-I ESP	18.88297%	13.80202%	20.30667%	22.65206%	3.55460%	18.58030%	0.12710%
Singrauli I & II ESP	6.80019%	38.77737%	53.02030%	41.60665%	54.37570%	36.01210%	56.41380%
Talcher STPP-I-ESP				2.82990%			
TTPS -II ESP	9.21399%	7.91649%	0.42123%	0.49892%	1.22850%		
Unchahar-I ESP	3.96507%	6.16078%	1.81156%	4.83787%	0.36020%	3.00180%	2.67880%
VSTPP I & II ESP	28.74275%	0.73190%	5.37584%	4.80512%	5.47810%	2.54150%	14.35770%
Total	**100.00002%**	**100.00000%**	**100.00000%**	**100.00000%**	**100.00000%**	**100.00000%**	**100.00000%**

Details of Refinancing

Sr. No.	Bank	ROI on refinancing date	Date of refinancing	Refinanced with Bank	Refinanced Amount (Rs. In crore)	New Loan Amount (Rs. In crore)	ROI of relplaced Loan	saving s	saving to be retained (Percent)	Remarks
1	Power Finance Corporation - V	7.31%	15-Oct-20	Bonds Series-72	4,000.00	4,000.00	5.45%	1.86%	0.9300%	Loan outstanding as on 14.10.2020 from PFC-V have been foreclosed by way of refinancing from Bond Series-72 at a concessional rate. One-half of the savings in the interest rate is added to the weighted average rate of loan.

Refinancing of PFC Loans 15.10.2020

BP NO.	DESCRIPTION	O/s amount	Interest rate benchmark and rate on swap date	Refinanced by Loan	Interest rate benchmark and rate on swap date
###	Power Finance Corporation	41,66,66,66,668	3Y-AAA Bond rate +45bps	Bonds- Rs. 4000Cr , HDFC-IX-Rs. 166.66	5.45%/ Repo rate+195bps-5.95%

Particulars					
Source of Loan - Bonds Series	72	73	74	75	78
Currency	INR	INR	INR	INR	INR
Amount of Loan sanctioned (In Lakh)	4,00,000	2,50,000	3,99,600	3,00,000	2,00,000
Amount of Gross Loan drawn upto COD (In La	4,00,000	2,50,000	3,99,600	3,00,000	2,00,000
Interest Type	Fixed	Fixed	Fixed	Fixed	Fixed
Fixed Interest Rate, if applicable	5.45%	6.43%	6.87%	6.69%	7.44%
Base Rate, if Floating Interest	N/A	N/A	N/A	N/A	N/A
Margin, if Floating Interest	N/A	N/A	N/A	N/A	N/A
Are there any Caps/Floor	No	No	No	No	No
If above is yes,specify caps/floor	N/A	N/A	N/A	N/A	N/A
Moratorium Period (In Years)	5	10	15 Years and 1 day	10	10
Moratorium effective from*	15-10-2020	27-01-2021	20-04-2021	13-09-2021	25-08-2022
Repayment Period	Bullet Repayment	Bullet Repayment	Bullet Repayment	Bullet Repayment	Bullet Repayment
Repayment effective from	15-10-2025	27-01-2031	21-04-2036	13-09-2031	25-08-2032
Repayment Frequency	Bullet Repayment	Bullet Repayment	Bullet Repayment	Bullet Repayment	Bullet Repayment
Repayment Instalment (In Lakh)	4,00,000	2,50,000	3,99,600	3,00,000	2,00,000
Base Exchange Rate	N/A	N/A	N/A	N/A	N/A
Door to Door Maturity (In Years)	5	10	15 Years and 1 day	10	10

Name of the Projects	72	73	74	75	78
Anta Solar 90MW				650.00	900.00
Auraiya R&M		200.00			
Auraiya Solar 20MW		400.00			
Auraiya Solar FS 20MW			150.00		586.00
Barauni-II			1,500.00	8,400.00	500.00
BARH I	3,866.67	51,100.00	32,900.00	42,800.00	4,511.00
BARH II	62,500.00				
BONGAIGAON	27,200.00				
CC					
CC - Jhabua Power					60,000.00
CC - NEEPCO		18,243.00	56,696.00	48,250.00	10,922.00
CC - THDC		34,207.00	1,06,304.00	90,470.00	20,478.00
CHATTI BARIATU CMB		825.00	200.00	1,350.00	211.00
DADRI GAS R&M			100.00	200.00	
DARLIPALLI		28,300.00	11,500.00	1,000.00	500.00
DULANGA COAL		2,700.00	3,400.00	4,100.00	
FARAKKA III	37,900.00				
FARAKKA R&M		1,700.00	1,600.00	1,550.00	
Farakka-I , II & III FGD			1,500.00	550.00	
Faridabad R&M		100.00		700.00	
GADARWARA		19,000.00	7,500.00		
Gandhar 20MW			3,750.00	90.00	
KAHALGAON II	3,800.00				
KAHALGAON R&M		600.00	1,200.00	2,620.00	
Kahalgaon-I & II FGD			300.00		
Kawas Solar			2,800.00	5,250.00	800.00
Kayamkulam FS (22 MW)		170.00	2,000.00	2,195.00	100.00
Kayamkulam FS (70 MW)		1,830.00	2,850.00	1,925.00	
KHARGONE		3,000.00	2,000.00		500.00
Kirenderi Coal Mine		7,350.00		165.00	1,900.00
KOLDAM	18,800.00				
KORBA III	9,900.00				
KORBA R&M	1,500.00	2,300.00	1,350.00	4,050.00	2,200.00
Korba-I, II & III FGD			100.00		
KUDGI					
KUDGI-FGD			2,950.00	1,000.00	
LARA		1,700.00	14,000.00		
MAUDA I	30,500.00		500.00		
MAUDA II			100.00	2,200.00	
Nabinagar					5,664.00
NCPS-FGD				5,600.00	

Particulars					
Source of Loan - Bonds Series	72	73	74	75	78
NCTPP II	31,733.33				
NCTPP R&M			200.00		
Nokh Solar Plot-I (245MW)					7,500.00
Nokh Solar Plot-II (245MW)					7,500.00
Nokh Solar Plot-III (245MW)					7,500.00
NORTH KARANPURA		9,500.00	11,700.00	11,900.00	3,917.00
PAKRI BARWADIH CMB	10,800.00		20,000.00		41,800.00
RAMAGUNDAM R&M			3,300.00		
Ramagundam Floating Solar-100 MW		3,375.00	3,800.00	8,640.00	1,400.00
Ramagundam I & II R&M		4,200.00		8,985.00	1,800.00
RAMAGUNDAM SOLAR					
Ramagundam-I & II FGD				100.00	
Ramagundam-III (1x500 MW)			400.00		
RAMMAM		3,300.00	1,100.00	800.00	311.00
Rihand- I FGD				20.00	
Rihand- II & III FGD				130.00	
RIHAND III	31,400.00				
RIHAND R&M	700.00	1,200.00	2,000.00	6,275.00	2,400.00
Rihand Solar (20MW)			300.00	510.00	400.00
Simhadri Floating		1,875.00	3,050.00	525.00	
SIMHADRI II	38,700.00				
SIMHADRI R&M				200.00	
Simhadri-II & I (2x500 MW) & (2x500 MW) FGD			7,600.00	1,150.00	
Singrauli R&M		4,200.00	1,700.00	2,725.00	1,300.00
Singrauli-I & II FGD			8,700.00	150.00	
SIPAT I	34,500.00				
Sipat-I (3x660 MW) FGD			5,600.00	1,100.00	500.00
SIPAT II	900.00				
SOLAPUR					
Solapur Solar				2,575.00	200.00
Solapur-FGD			2,700.00	3,450.00	
Talaipali Coal Mine		19,400.00	4,800.00	2,160.00	856.00
TALCHER II	3,400.00				
TALCHER R&M		500.00			
TANDA R&M	1,500.00				
TANDA II		9,500.00	16,700.00	1,000.00	
TAPOVAN VISHNUGAD	10,600.00	6,200.00	8,000.00	1,500.00	166.00
TELANGANA		9,725.00	20,300.00	9,200.00	8,678.00
TSTPP R&M				640.00	700.00
TSTPS Stage-II & I FGD			9,700.00		
UNCHAHAR IV					
Unchahar R&M	500.00	500.00	900.00	1,050.00	1,500.00
Unchahar-I, II & III-FGD			5,400.00	5,100.00	
Unchahar-IV-FGD			2,750.00	1,200.00	
VINDHYACHAL IV	39,300.00				
VINDHYACHAL R&M		2,800.00	1,450.00	2,900.00	1,800.00
Vindhyachal-I &II FGD			200.00	900.00	
TOTAL	**4,00,000.00**	**2,50,000.00**	**3,99,600.00**	**3,00,000.00**	**2,00,000.00**

FORM-8	Details of Allocation of Corporate Bonds to various projects
Name of the Company	**NTPC LIMITED**
Name of the Power Station	
Commercial Operation Date (COD)	
Particulars	
Source of Loan - Bonds Series	**54**
Currency	INR
Amount of Loan sanctioned (In Lakh)	10,30,683.05
Amount of Gross Loan drawn upto COD (In Lakh)	10,30,683.05
Interest Type	Fixed
Fixed Interest Rate, if applicable**	8.49%
Base Rate, if Floating Interest	N/A
Margin, if Floating Interest	N/A
Are there any Caps/Floor	No
If above is yes,specify caps/floor	N/A
Moratorium Period (In Years)	8
Moratorium effective from*	25-03-2015
Repayment Period	Installments Due on 25/03/2023, 25/03/2024 & 25/03/2025
Repayment effective from	25-03-2023
Repayment Frequency	Installments Due on 25/03/2023, 25/03/2024 & 25/03/2025
Repayment Instalment (In Lakh)	Installments 1st - 206,136.61 2nd - 412,273.22 3rd - 412,273.22
Base Exchange Rate	N/A
Door to Door Maturity (In Years)	10
Name of the Projects	**54**
Anantpur Solar	5,600.00
Auraiya R & M	
Badarpur R & M	2,300.00
Barh I	74,883.05
Barh II	63,500.00
Bhadla Solar	

Particulars	
Bongaigaon	54,000.00
Chatti Bariatu CMB	8,100.00
Corporate Centre	
Dadri Gas R & M	600.00
Darlipalli	49,200.00
Dulanga CMB	
Farakka III	10,900.00
Farakka R & M	2,000.00
Gadarwara	81,000.00
Gandhar R & M	4,300.00
Kahalgaon II Phase I	
Kahalgaon II Phase II	1,800.00
Kahalgaon R & M	2,000.00
Kawas R & M	1,400.00
Khargone	45,000.00
Koldam	25,100.00
Korba III	9,200.00
Korba R & M	4,400.00
Kudgi FGD	
Kudgi	1,23,300.00
Lara	**53,300.00**
Lata Tapovan	1,600.00
Lohari Nagpala	
Mauda I	21,900.00
Mauda II	45,800.00
Mandsaur Solar	
NCTPP II	11,000.00
NCPS-FGD	
NCTPP R & M	3,700.00
North Karanpura	12,400.00
Pakri Barwadih CMB	26,600.00
Ramagundam I & II R & M	2,400.00
Ramagundam III	

Particulars	
Ramagundum Floating Solar-100 MW	
Rammam	3,100.00
Rihand II	
Rihand III	28,300.00
Rihand R & M	2,500.00
Simhadari II	26,800.00
Simhadari R & M	900.00
Vindhyachal Hydro	1,900.00
Singrauli R & M	1,600.00
Vindhyachal Solar	4,800.00
Sipat I	20,500.00
Sipat II	
Solapur	70,300.00
Talchar II	12,000.00
Talcher R & M	1,600.00
Talcher Thermal R & M	1,000.00
Tanda II	9,000.00
Tanda R& M	
Tapovan Vishnugad	26,400.00
Talaipali Coal Mine	
Telengana	
Unchahar III	
Unchahar IV	17,400.00
Unchahar R & M	3,400.00
Vindhyachal III	
Vindhyachal IV	17,200.00
Vindhyachal R & M	1,200.00
Vindhyachal V	33,500.00
Bilhaur Solar 140 MW	
Bilhaur Solar 85 MW	
CC	
TOTAL	**10,30,683.05**

PART-I
FORM- 9A

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	NTPC Limited
Name of the Generating Station	Unchahar Stage-I
COD	13-02-1992
For Financial Year	2024-29 (Summary)

Sl. No.	Head of Work /Equipment	ACE Claimed (Actual / Projected)					Regulations under which claimed	Justification	Admitted Cost by the Commission, if any
		2024-25	2025-26	2026-27	2027-28	2028-29			
1	2	3	4	5	6	7	8	8A	9
A.	**Works eligble for RoE at Normal Rate**								
1	Upgradation of Existing Control Systems deployed in Unchahar-I		88.00	1140.00	1600.00	800.00	25(2)(b) ,25(2)(c)	Justification is provided in Form 9 of 2025-26	
2	Procurement of Diesal-Electric Locomotive			600.00	600.00		25(2)(b), 25(2)(c), and 26(1)(d).	Justification is provided in Form 9 of 2026-27	
	Total (A)	-	88.00	1,740.00	2,200.00	800.00			
B.	**Works eligble for Return on Equity linked to SBI MCLR+ 350 basis points:**								
1	AGC System			120.00			26(1)(b)	Justification is provided in Form 9 of 2026-27	
2	Ash Utilization Infrastructure			126.90	540.00	602.10	26-1(b), 19(2)(l)	Justification is provided in Form 9 of 2026-27	
	Total (B)	0.00	0.00	246.90	540.00	602.10			
Total Add. Cap. Claimed (A+B)		-	88.00	1,986.90	2,740.00	1,402.10			

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Unchahar Stage-I**
COD	**13-02-1992**
For Financial Year	**2024-25**

Amount in Rs Lakh

Sl. No.	Head of Work /Equipment	ACE Claimed (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**							
	NIL							
	Total (A)	**-**	**-**	**-**	**-**			
B.	**Works eligble for Return on Equity linked to SBI MCLR+ 350 basis points:**							
	NIL							
	Total (B)	**-**	**-**	**-**	**-**			
Total Add. Cap. Claimed (A+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	Unchahar Stage-I
COD	13-02-1992
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 eligible for RoE at Normal Rate							
1	Upgradation of Existing Control Systems deployed in Unchahar-I	88.00	-	88.00		25(2)(b) ,25(2)(c)	It is submitted that the Stage-I HMI system of OEM Yokogawa and Honeywell and TSI system of OEM Shinkawa have been declared obsolete by respective OEMs(Attached as annexure A-1).Further,these systems are based on window XP/7 operating system. As Microsoft has officially ended support for Windows XP on April 8, 2014 and Window 7 on January 14,2020, no further maintenance patches, security updates, or antivirus support are available, exposing the existing system to significant security risks. It is further submitted that , the CEA Guidelines (2021) for Cyber Security in the Power Sector (attached as Annexure A-2) mandates (i) Phasing out legacy systems, (ii) Hardening existing systems with additional security controls in consultation with the OEM, and (iii) Maintaining system logs for a minimum of six months. In light of these mandates, it has become essential to upgrade the existing systems. It is submitted that the proposed upgradation involves upgradation of existing System and implementing a cybersecurity suite for HMI to strengthen system hardening as mandated in the CEA guideline. In view of the above, it is respectfully submitted that the Hon'ble Commission may allow the proposed expenditure under Section 25(2)(c),25(2)(b) of Tariff Regulations 2024.	
	Total (A)	88.00	-	88.00				
B.	Works eligible for Return on Equity linked to SBI MCLR+ 350 basis points:							
							NIL	
	Total (B)	-	-	-				
Total Add. Cap. Claimed (A+B)		88.00	-	88.00	-			

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	NTPC Limited
Name of the Generating Station	Unchahar Stage-I
COD	13-02-1992
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 eligible for RoE at Normal Rate							
1	Upgradation of Existing Control Systems deployed in Unchahar-I	1,140.00	-	1,140.00		25(2)(b) ,25(2)(c)	Please refer to Justification provided in Form-9 2025-26 for Same item	
2	Procurement of Diesel-Electric Locomotive	600.00	-	600.00		25(2)(b), 25(2)(c), and 26(1)(d).	It is respectfully submitted that, as per Railway's RBA No. 25/2006 (attached as Annexure A3), replacement of existing diesel-electric locomotives is mandated upon completion of 36 years of service. In this regard, the existing locomotive commissioned in 1988 has now surpassed 36 years of operational life. Therefore, based on the aforementioned mandate and safety considerations, its replacement is essential.Additionally, it is pertinent to highlight that in GMR Warora Energy Limited v. CERC & Ors., notifications or circulars issued by government entities, such as Coal India or Indian Railways, were recognized by the Hon'ble Supreme Court as constituting a 'Change in Law' event. In view of the above, it is requested that the Hon'ble Commission kindly allow the proposed expenditure under Sections 25(2)(b), 25(2)(c), and 26(1)(d) of Tariff Regulations 2024.	
	Total (A)	1,740.00	-	1,740.00				
B.	Works eligible for Return on Equity linked to SBI MCLR+ 350 basis points:							
1	AGC System	120		120.00		26(1)(b)	Hon'ble Commission vide its order dated 28.06.2019 in petion 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 28.06.2019 is attached as Annexure-A4. Accordingly, in compliance of direction of Hon'ble Commission, implementation of AGC is proposed to be carried out at the instant station. Therefore, it is humbly requested that Hon'ble Commission may be pleased to allow the same at the instant station under Regulation 26 (1) (b) of Tariff Regulations 2024.	
2	Ash Utilization Infrastructure	126.9		126.90		26-1(b), 19(2)(i)	It is respectfully submitted that in accordance with the Ministry of Environment, Forest and Climate Change (MOEF&CC) notification dated 31st December 2021(Attached as annexure-A5), all coal or lignite-based thermal power plants are responsible for ensuring 100% utilization of the ash generated by them in an eco-friendly manner. To comply with this mandate and to enhance ash utilisation , this expenditure is proposed to be incurred in the instant station during tariff period 2024-29. Further, it is submitted that Hon'ble commission acknowledges the inclusion of capital expenditure on account of ash disposal and utilization in capital cost as per provision of regulation 19(2)(i). In view of this, Hon'ble Commission may be pleased to allow the same under Reg. 26(1)(b) and 19(2)(i) of Tariff Regulations 2024.	
	Total (B)	246.90	-	246.90				
Total Add. Cap. Claimed (A+B)		1,986.90	-	1,986.90	-	-		

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	**NTPC Limited**
Name of the Generating Station	**Unchahar Stage-I**
COD	**13-02-1992**
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**							
1	Upgradation of Various Control Systems deployed in Unchahar-I	1,600.00	-	1,600.00		25(2)(b) ,25(2)(c)	Please refer to Justification provided in Form-9 2025-26 for Same item	
2	Procurement of Diesel/Electric Locomotive	600.00	-	600.00		25(2)(b), 25(2)(c), and 26(1)(d).	Please refer to Justification provided in Form-9 2026-27 for Same item	
	Total (A)	**2,200.00**	**-**	**2,200.00**				
B.	**Works eligble for Return on Equity linked to SBI MCLR+ 350 basis points:**							
2	Ash Utilization Infrastructure	540.00		540.00		26-1(b), 19(2)(i)	Please refer to Justification provided in Form-9 2026-27 for Same item	
	Total (B)	**540.00**	**-**	**540.00**				
Total Add. Cap. Claimed (A+B)		**2,740.00**	**-**	**2,740.00**	**-**	**-**		

(Petitioner)

PART-I
FORM- 9

Year wise Statement of Additional Capitalisation after COD

Name of the Petitioner	NTPC Limited
Name of the Generating Station	Unchahar Stage-I
COD	13-02-1992
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	Upgradation of Various Control Systems deployed in Unchahar-I	800.00	-	800.00		25(2)(b) ,25(2)(c)	Please refer to Justification provided in Form-9 2025-26 for Same item	
	Total (A)	**800.00**	**-**	**800.00**				
B.	**Works eligble for Return on Equity linked to SBI MCLR+ 350 basis points:**							
2	Ash Utilization Infrastructure	602.1		602.10		26-1(b), 19(2)(i)	Please refer to Justification provided in Form-9 2026-27 for Same item	
	Total (B)	**602.10**	**-**	**602.10**				
Total Add. Cap. Claimed (A+B)		**1,402.10**	**-**	**1,402.10**	**-**	**-**		

(Petitioner)

PART-I
FORM- 10

Name of the Petitioner			**NTPC Limited**						
Name of the Generating Station			**Unchahar Stage-I**						
Date of Commercial Operation			**13-02-1992**						
						Amount in Rs Lakh			
Financial Year (Starting from COD)1	Actual				Admitted				
	2024-25	**2025-26**	**2027-28**	**2028-29**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**
1		3	5	6	7	8	9	10	11
Amount capitalised in Work/ Equipment									
Financing Details									
Loan-1	**Add cap is proposed to be finance in Debt:Equity ratio of 70:30**								

(Petitioner)

PART-I
FORM- 12

Statement of Depreciation

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Unchahar Stage-I**

(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	96,067.88	96,377.39	96,377.39	96,465.39	98,452.29	1,01,192.29
2	Closing Capital Cost	96,377.39	96,377.39	96,465.39	98,452.29	1,01,192.29	1,02,594.39
3	Average Capital Cost	96,222.64	96,377.39	96,421.39	97,458.84	99,822.29	1,01,893.34
1a	*Cost of IT Equipments & Software included in (1) above	254.19	298.38	298.38	298.38	298.38	298.38
2a	*Cost of IT Equipments & Software included in (2) above	298.38	298.38	298.38	298.38	298.38	298.38
3a	*Average Cost of IT Equipments & Software	276.29	298.38	298.38	298.38	298.38	298.38
4	Freehold land	357.08	357.08	357.08	357.08	357.08	357.08
8	Rate of depreciation						
6	Depreciable value	86,306.63	86,448.12	86,487.72	87,421.42	89,548.53	91,412.47
9	Balance useful life at the beginning of the period	-	-	-	-	-	-
9	Depreciation (for the period)	379.56	580.18	39.60	933.71	2,127.11	1,863.95
10	Depreciation (annualised)	379.56	580.18	39.60	933.71	2,127.11	1,863.95
11	Cumulative depreciation at the end of the period	86,306.63	86,448.12	86,487.72	87,421.42	89,548.53	91,412.47
12	Less: Cumulative depreciation adjustment on account of un-discharged liabilities deducted as on 01.04.2009						
13	Add: Cumulative depreciation adjustment on account of liability Discharge						
14	Less: Cumulative depreciation adjustment on account of de-capitalisation	438.69					
15	Net Cumulative depreciation at the end of the period after adjustments	85,867.94	86,448.12	86,487.72	87,421.42	89,548.53	91,412.47

***to be provided at the time of truing up.**

(Petitioner)

Sl.	Calculation of Interest on Actual Loans / Particulars	2024-25	2025-26	2026-27	2027-28	2028-29
	Name of the Company : NTPC Limited					
	Name of the Power Station : Unchahar Stage-I					
1	**SBI-VIII D18**					
	Gross loan - Opening	500.00	500.00	500.00	500.00	500.00
	Cumulative repayments of Loans	166.67	222.22	277.78	333.33	388.89
	Net loan - Opening	333.33	277.78	222.22	166.67	111.11
	Addition	-	-	-	-	-
	Repayments of Loans during the year	55.56	55.56	55.56	55.56	55.56
	Net loan - Closing	277.78	222.22	166.67	111.11	55.56
	Average Net Loan	305.56	250.00	194.44	138.89	83.33
	Rate of Interest on Loan	8.2000%	8.2000%	8.2000%	8.2000%	8.2000%
	Interest on loan	25.06	20.50	15.94	11.39	6.83
2	**HDFC-IV D4 (9 Yearly Instalment Repayment form 17.04.2021)**					
	Gross loan - Opening	7,000.00	7,000.00	7,000.00	7,000.00	7,000.00
	Cumulative repayments of Loans	2,333.33	3,111.11	3,888.89	4,666.67	5,444.44
	Net loan - Opening	4,666.67	3,888.89	3,111.11	2,333.33	1,555.56
	Addition	-	-	-	-	-
	Repayments of Loans during the year	777.78	777.78	777.78	777.78	777.78
	Net loan - Closing	3,888.89	3,111.11	2,333.33	1,555.56	777.78
	Average Net Loan	4,277.78	3,500.00	2,722.22	1,944.44	1,166.67
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on loan	340.08	278.25	216.42	154.58	92.75
3	**HDFC-VII D3 (9 Yearly Instalment Repayment form 11.06.2026)**					
	Gross loan - Opening	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
	Cumulative repayments of Loans	-	-	-	111.11	222.22
	Net loan - Opening	1,000.00	1,000.00	1,000.00	888.89	777.78
	Addition	-	-	-	-	-
	Repayments of Loans during the year	-	-	111.11	111.11	111.11
	Net loan - Closing	1,000.00	1,000.00	888.89	777.78	666.67
	Average Net Loan	1,000.00	1,000.00	944.44	833.33	722.22
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on loan	79.50	79.50	75.08	66.25	57.42
4	**HDFC-X D2 (12 Yearly Instalment Repayment form 24.11.2025)**					
	Gross loan - Opening	400.00	400.00	400.00	400.00	400.00
	Cumulative repayments of Loans	-	-	33.33	66.67	100.00
	Net loan - Opening	400.00	400.00	366.67	333.33	300.00
	Addition					
	Repayments of Loans during the year	-	33.33	33.33	33.33	33.33
	Net loan - Closing	400.00	366.67	333.33	300.00	266.67
	Average Net Loan	400.00	383.33	350.00	316.67	283.33
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on loan	31.80	30.48	27.83	25.18	22.53
5	**HDFC-IX D8 (12 Yearly Instalment Repayment form 30.06.2024)**					
	Gross loan - Opening	1,600.00	1,600.00	1,600.00	1,600.00	1,600.00
	Cumulative repayments of Loans	-	133.33	266.67	400.00	533.33
	Net loan - Opening	1,600.00	1,466.67	1,333.33	1,200.00	1,066.67
	Addition					
	Repayments of Loans during the year	133.33	133.33	133.33	133.33	133.33
	Net loan - Closing	1,466.67	1,333.33	1,200.00	1,066.67	933.33
	Average Net Loan	1533.33	1400.00	1266.67	1133.33	1000.00
	Rate of Interest on Loan	7.9500%	7.9500%	7.9500%	7.9500%	7.9500%
	Interest on loan	121.90	111.30	100.70	90.10	79.50
6	**PNB-III (9 Yearly Instalment Repayment form 01.02.2022)**					
	Gross loan - Opening	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00
	Cumulative repayments of Loans	666.67	888.89	1,111.11	1,333.33	1,555.56
	Net loan - Opening	1,333.33	1,111.11	888.89	666.67	444.44
	Addition	-	-	-	-	-
	Repayments of Loans during the year	222.22	222.22	222.22	222.22	222.22
	Net loan - Closing	1,111.11	888.89	666.67	444.44	222.22
	Average Net Loan	1,222.22	1,000.00	777.78	555.56	333.33
	Rate of Interest on Loan	7.9000%	7.9000%	7.9000%	7.9000%	7.9000%
	Interest on loan	96.56	79.00	61.44	43.89	26.33
7	**Bonds 54 Series (Repayment in 3 yearly installments starting 25.03.2023)**					
	Gross loan - Opening	3,400.00	3,400.00	3,400.00	3,400.00	3,400.00
	Cumulative repayments of Loans	2,040.00	3,400.00	3,400.00	3,400.00	3,400.00
	Net loan - Opening	1,360.00	-	-	-	-
	Addition	-	-	-	-	-
	Repayments of Loans during the year	1,360.00				
	Net loan - Closing	-	-	-	-	-
	Average Net Loan	680.00	-	-	-	-
	Rate of Interest on Loan	8.5200%	8.5200%	8.5200%	8.5200%	8.5200%

	Interest on loan	57.94	0.00	0.00	0.00	0.00
8	**BOND-72**					
	Gross loan - Opening	260.42	260.42	260.42	260.42	260.42
	Cumulative repayments of Loans	-	-	-	-	-
	Net loan - Opening	260.42	260.42	260.42	260.42	260.42
	Addition	-	-	-	-	-
	Repayments of Loans during the year	-	-	-	-	-
	Net loan - Closing	260.42	260.42	260.42	260.42	260.42
	Average Net Loan	260.42	260.42	260.42	260.42	260.42
	Rate of Interest on Loan	6.4100%	6.4100%	6.4100%	6.4100%	6.4100%
	Interest on loan	16.69	16.69	16.69	16.69	16.69
9	**BOND-72**					
	Gross loan - Opening	239.58	239.58	239.58	239.58	239.58
	Cumulative repayments of Loans	143.75	143.75	239.58	239.58	239.58
	Net loan - Opening	95.83	95.83	-	-	-
	Addition	-	-	-	-	-
	Repayments of Loans during the year		95.83			
	Net loan - Closing	95.83	-	-	-	-
	Average Net Loan	95.83	47.92	-	-	-
	Rate of Interest on Loan	5.4800%	5.4800%	5.4800%	5.4800%	5.4800%
	Interest on loan	5.25	2.63	0.00	0.00	0.00
10	**BOND-73**					
	Gross loan - Opening	500.00	500.00	500.00	500.00	500.00
	Cumulative repayments of Loans	300.00	300.00	300.00	300.00	300.00
	Net loan - Opening	200.00	200.00	200.00	200.00	200.00
	Addition	-	-	-	-	-
	Repayments of Loans during the year					
	Net loan - Closing	200.00	200.00	200.00	200.00	200.00
	Average Net Loan	200.00	200.00	200.00	200.00	200.00
	Rate of Interest on Loan	6.4600%	6.4600%	6.4600%	6.4600%	6.4600%
	Interest on loan	12.92	12.92	12.92	12.92	12.92
11	**BOND-74**					
	Gross loan - Opening	900.00	900.00	900.00	900.00	900.00
	Cumulative repayments of Loans	540.00	540.00	540.00	540.00	540.00
	Net loan - Opening	360.00	360.00	360.00	360.00	360.00
	Addition	-	-	-	-	-
	Repayments of Loans during the year					
	Net loan - Closing	360.00	360.00	360.00	360.00	360.00
	Average Net Loan	360.00	360.00	360.00	360.00	360.00
	Rate of Interest on Loan	6.9000%	6.9000%	6.9000%	6.9000%	6.9000%
	Interest on loan	24.84	24.84	24.84	24.84	24.84
12	**BOND-75**					
	Gross loan - Opening	1,050.00	1,050.00	1,050.00	1,050.00	1,050.00
	Cumulative repayments of Loans	630.00	630.00	630.00	630.00	630.00
	Net loan - Opening	420.00	420.00	420.00	420.00	420.00
	Addition	-	-	-	-	-
	Repayments of Loans during the year					
	Net loan - Closing	420.00	420.00	420.00	420.00	420.00
	Average Net Loan	420.00	420.00	420.00	420.00	420.00
	Rate of Interest on Loan	6.7200%	6.7200%	6.7200%	6.7200%	6.7200%
	Interest on loan	28.22	28.22	28.22	28.22	28.22
13	**BOND-78**					
	Gross loan - Opening	1,050.00	1,050.00	1,050.00	1,050.00	1,050.00
	Cumulative repayments of Loans	630.00	630.00	630.00	630.00	630.00
	Net loan - Opening	420.00	420.00	420.00	420.00	420.00
	Addition	-	-	-	-	-
	Repayments of Loans during the year					
	Net loan - Closing	420.00	420.00	420.00	420.00	420.00
	Average Net Loan	420.00	420.00	420.00	420.00	420.00
	Rate of Interest on Loan	7.4700%	7.4700%	7.4700%	7.4700%	7.4700%
	Interest on loan	31.37	31.37	31.37	31.37	31.37
14	**KFW ESP IV Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	154.88	154.88	154.88	154.88	154.88
	Cumulative repayments of Loans	135.52	154.88	154.88	154.88	154.88
	Net loan - Opening	19.36	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	19.36				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	9.68	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.31	0.00	0.00	0.00	0.00
15	**KFW ESP VI Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	205.00	205.00	205.00	205.00	205.00
	Cumulative repayments of Loans	179.37	205.00	205.00	205.00	205.00

	Net loan - Opening	25.62	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	25.62				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	12.81	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.41	0.00	0.00	0.00	0.00
16	**KFW ESP VIII Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	122.00	122.00	122.00	122.00	122.00
	Cumulative repayments of Loans	106.75	122.00	122.00	122.00	122.00
	Net loan - Opening	15.25	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	15.25				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	7.63	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.24	0.00	0.00	0.00	0.00
17	**KFW ESP IX Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	349.97	349.97	349.97	349.97	349.97
	Cumulative repayments of Loans	306.23	349.97	349.97	349.97	349.97
	Net loan - Opening	43.75	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	43.75				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	21.87	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.70	0.00	0.00	0.00	0.00
18	**KFW ESP XI Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	13.78	13.78	13.78	13.78	13.78
	Cumulative repayments of Loans	12.06	13.78	13.78	13.78	13.78
	Net loan - Opening	1.72	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	1.72				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	0.86	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.03	0.00	0.00	0.00	0.00
19	**KFW ESP XII Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	113.00	113.00	113.00	113.00	113.00
	Cumulative repayments of Loans	98.87	113.00	113.00	113.00	113.00
	Net loan - Opening	14.12	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	14.12				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	7.06	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.23	0.00	0.00	0.00	0.00
20	**KFW ESP XIII Loan Repayment in 16 semi-annual instalments starting 15.09.2017**					
	Gross loan - Opening	103.00	103.00	103.00	103.00	103.00
	Cumulative repayments of Loans	90.12	103.00	103.00	103.00	103.00
	Net loan - Opening	12.87	0.00	0.00	0.00	0.00
	Addition	0.00	0.00	0.00	0.00	0.00
	Repayments of Loans during the year	12.87				
	Net loan - Closing	0.00	0.00	0.00	0.00	0.00
	Average Net Loan	6.44	0.00	0.00	0.00	0.00
	Rate of Interest on Loan	3.1900%	3.1900%	3.1900%	3.1900%	3.1900%
	Interest on loan	0.21	0.00	0.00	0.00	0.00
	TOTAL LOAN					
	Gross loan - Opening	22,301.73	22,301.73	22,301.73	22,301.73	22,301.73
	Cumulative repayments of Loans	9,719.44	12,401.03	13,719.09	15,052.42	16,385.76
	Net loan - Opening	12,582.29	9,900.69	8,582.64	7,249.31	5,915.97
	Addition	-	-	-	-	-
	Repayments of Loans during the year	2,681.59	1,318.06	1,333.33	1,333.33	1,333.33
	Net loan - Closing	9,900.69	8,582.64	7,249.31	5,915.97	4,582.64
	Average Net Loan	11,241.49	9,241.67	7,915.97	6,582.64	5,249.31
	Rate of Interest on Loan	7.7770%	7.7443%	7.7244%	7.6783%	7.6088%
	Interest on loan	874.25	715.70	611.46	505.44	399.41

Part-I

Form-15

Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Apr-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	189033.455	100359.926	0.000
2	Value of Stock	Rs.	889669445	1547087057	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	403064.140	117811.400	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-785.120	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	402279.020	117811.400	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3224.513	235.623	0.000
7	Net coal / Lignite Supplied (5-6)	MT	399054.507	117575.777	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1273747315	1733468274	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.			
10	Handling, Sampling and such other similar charges	Rs.	69514931	0	0
11	Total amount Charged (8+9+10)	Rs.	1343262246	1733468274	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	566345964	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	566345964	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	1909608210	1733468274	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4759.96	15052.86	0
19	Blending Ratio (Domestic /Imported)	%	78.99%	21.01%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	6922.76		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	6922.76		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3800		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3731		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5023	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5030	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3906.8		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3906.8		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3749		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3811		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5029	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5067	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	4055.25		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	4055.25		

Part-I

Form-15

Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	May-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	226540.962	167784.703	0.000
2	Value of Stock	Rs.	1078326951	2525639399	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	487502.120	50732.000	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-1106.770	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	486395.350	50732.000	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3900.017	101.464	0.000
7	Net coal / Lignite Supplied (5-6)	MT	482495.333	50630.536	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1587140693	720082415	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.			
10	Handling, Sampling and such other similar charges	Rs.	85041697	0	0
11	Total amount Charged (8+9+10)	Rs.	1672182290	720082415	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	683765551	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	683765551	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2355947941	720082415	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / PMT	4843.58	14860.33	0
19	Blending Ratio (Domestic /Imported)	%	79.16%	20.84%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / PMT	6930.88		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / PMT	6930.88		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3749		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3811		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5029	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5067	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	4055.25		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		4055.25		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3791		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3893		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5049	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5164	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	4114.08		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	4114.08		

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Form-15

Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel: Coal Month Jun-23 Provisional 01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	329288.295	63924.239	0.000
2	Value of Stock	Rs.	1594934694	2435967735	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	392569.530	0.000	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-209.000	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	392360.530	0.000	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3140.556	0.000	0.000
7	Net coal / Lignite Supplied (5-6)	MT	389219.974	0.000	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1424551998	0	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		0	0
10	Handling, Sampling and such other similar charges	Rs.	87675423		
11	Total amount Charged (8+9+10)	Rs.	1512227421	0	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	535553253	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	535553253	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2047780654	0	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	5069.80	14860.33	0
19	Blending Ratio (Domestic /Imported)	%	77.24%	22.76%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	7298.60		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	7298.60		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3791		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3893		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5049	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5164	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	4114.08		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		4114.08		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3680		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3823		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5076	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		0	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	4121.33		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	4121.33		

Part-I

Form-15

Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Jul-23	Provisional	01-08-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	304557.269	95796.239	0.000
2	Value of Stock	Rs.	1544045327	1423563378	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	411326.030	39119.600	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-189.000	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	411137.030	39119.600	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3290.608	78.239	0.000
7	Net coal / Lignite Supplied (5-6)	MT	407846.422	39041.361	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1491844402	665540412	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.	117044730	-58455057	0
10	Handling, Sampling and such other similar charges	Rs.			
11	Total amount Charged (8+9+10)	Rs.	1608889132	607085355	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	572498529	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	572498529	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2181387661	607085355	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / PMT	5229.38	15059.96	0
19	Blending Ratio (Domestic /Imported)	%	78.17%	21.83%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / PMT	7375.58		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / PMT	7375.58		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3680		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3823		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5076	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		0	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	4121.33		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		4121.33		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3840		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3851		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5076	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5417	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	4127.55		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	4127.55		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Aug-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	265458.691	64128.600	0.000
2	Value of Stock	Rs.	1388185509	965774092	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	436181.330	78216.800	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-132.000	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	436049.330	78216.800	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3489.451	156.434	0.000
7	Net coal / Lignite Supplied (5-6)	MT	432559.879	78060.366	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1444801629	1147474085	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		0	0
10	Handling, Sampling and such other similar charges	Rs.	133568386		
11	Total amount Charged (8+9+10)	Rs.	1578170016	1147474085	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	638195470	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	638195470	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2216365486	1147474085	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	5163.98	14862.25	0
19	Blending Ratio (Domestic /Imported)	%	79.01%	20.99%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	7199.88		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	7199.88		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3840		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3831		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5076	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5417	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	4127.55		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		4127.55		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3835		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3595		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5175	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		4920	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3967.4		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3967.4		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel: Coal Month Sep-23 Provisional 01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	191906.570	64263.967	0.000
2	Value of Stock	Rs	991000773	95510268	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	335545.480	50268.000	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-1607.600	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	333937.880	50268.000	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	2684.364	100.536	0.000
7	Net coal / Lignite Supplied (5-6)	MT	331253.516	50167.464	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs	1077574220	676305155	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs		-16606180	0
10	Handling, Sampling and such other similar charges	Rs	96283788		
11	Total amount Charged (8+9+10)	Rs	1173858008	659698975	0
D)	TRANSPORTATION	Rs			
12	Transportation charges by rail, ship, road transport	Rs	469766749	0	0
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			
16	Total Transportation Charges (12+13+14+15)	Rs	469766749	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs	1643624757	659698975	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	5035.98	14111.56	0.00
19	Blending Ratio (Domestic /Imported)	%	80.35%	19.65%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	6819.35		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	6819.35		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3815		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3595		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5175	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		4920	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3967.4		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3967.4		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3684		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3625		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5034	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5225	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3935.43		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3935.43		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Oct-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	52714.004	45495.631	0.000
2	Value of Stock	Rs.	265467059	642014427	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	434626.290	26371.000	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-3808.970	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	430817.420	26371.000	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3477.011	52.742	0.000
7	Net coal / Lignite Supplied (5-6)	MT	427340.409	26318.258	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1277180090	354429407	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		0	0
10	Handling, Sampling and such other similar charges	Rs.	71065202		
11	Total amount Charged (8+9+10)	Rs.	1348245293	354429407	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	549883574	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	549883574	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	1898128867	354429407	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4506.98	13475.36	0.00
19	Blending Ratio (Domestic /Imported)	%	84.29%	15.71%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	5978.94		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	5978.94		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3684		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3625		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5034	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5225	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3935.43		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3935.43		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3646		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3728		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5119	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5179	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3942.69		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3942.69		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Nov-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	11307.413	16288.889	0.000
2	Value of Stock	Rs.	50962102	226014248	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	474848.930	52743.400	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-6526.900	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	468322.030	52743.400	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3798.791	105.487	0.000
7	Net coal / Lignite Supplied (5-6)	MT	464523.239	52637.913	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1464754177	695067018	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		0	0
10	Handling, Sampling and such other similar charges	Rs.	61481317		
11	Total amount Charged (8+9+10)	Rs.	1526235494	695067018	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	658622213	0	0
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 MCR system, if applicable	Rs.			
16	Total Transportation Charges (12+13+14+15)	Rs.	658622213	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2184857706	695067018	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4698.77	13363.18	0.00
19	Blending Ratio (Domestic /Imported)	%	80.10%	19.90%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	6422.96		
20a	Weighted average cost of Coal / Lignite (Excluding Biomass)	Rs / MT	6422.96		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3646		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3728		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5119	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5179	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3942.69		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3942.69		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3719		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3829		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5142	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5197	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	4095.89		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	4095.89		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Dec-23	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	115374.652	9390.802	0.000
2	Value of Stock	Rs.	542119249	125490981	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	470415.570	46287.600	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-3977.410	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	466438.160	46287.600	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3763.325	92.575	0.000
7	Net coal / Lignite Supplied (5-6)	MT	462674.835	46195.025	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1308178836	633133878	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		-7065042	0
10	Handling, Sampling and such other similar charges	Rs.	65111122		
11	Total amount Charged (8+9+10)	Rs.	1373289959	626068836	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	636301217	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	636301217	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2009591173	626068836	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4414.35	13520.71	0.00
19	Blending Ratio (Domestic /Imported)	%	86.34%	13.66%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	5657.92		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	5657.92		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3719		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3829		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5142	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		0	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	4095.89		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		4095.89		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3825		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3472		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5184	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5140	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3754.12		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3754.12		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel: Coal Month Jan-24 Provisional 01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	199700.487	9059.827	0.000
2	Value of Stock	Rs	881547029	122495264	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	491478.140	51320.740	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-3334.760	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	488143.380	51320.740	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	5905.147	102.641	0.000
7	Net coal / Lignite Supplied (5-6)	MT	484238.233	51218.099	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs	1475167913	812171281	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs		0	0
10	Handling, Sampling and such other similar charges	Rs	10674426		
11	Total amount Charged (8+9+10)	Rs	1485842339	812171281	0
D)	TRANSPORTATION	Rs			
12	Transportation charges by rail, ship, road transport	Rs	575558340	0	0
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			
16	Total Transportation Charges (12+13+14+15)	Rs	575558340	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs	2061400679	812171281	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4302.94	15505.95	0.00
19	Blending Ratio (Domestic /Imported)	%	86.93%	13.07%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	5767.20		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	5767.20		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3825		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3472		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5184	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		0	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3754.12		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3754.12		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3534		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3743		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5147	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5051	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3861.28		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3861.28		

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Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel:	Coal	Month	Feb-24	Provisional	01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	258326.720	14914.925	0.000
2	Value of Stock	Rs.	1111564382	231270090	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	501358.030	39908.200	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-4027.170	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	497330.860	39908.200	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3978.647	79.816	0.000
7	Net coal / Lignite Supplied (5-6)	MT	493352.213	39828.384	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	1452998746	466624005	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		-13198696	0
10	Handling, Sampling and such other similar charges	Rs.	3,48,63,076.30		
11	Total amount Charged (8+9+10)	Rs.	1487861822	453425309	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	671455311	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	671455311	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2159317133	453425309	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4351.43	12507.38	0.00
19	Blending Ratio (Domestic /Imported)	%	82.79%	17.21%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	5755.09		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	5755.09		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3534		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3743		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5147	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5031	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3861.28		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3861.28		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3683		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3661		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5048	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5149	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3919		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3919		

Part-I

Form-15

Details/Information to be submitted in respect of Fuel for Computation of Energy Charges

NTPC LTD.

FGTPS Unchahar Stage-I

Fuel: Coal | Month: Mar-24 | Provisional | 01-06-2024

S. No.	Particulars	Unit	Domestic Type 1 (M1149100657)	Imported	Bio Mass
A)	OPENING QUANTITY				
1	Opening Quantity of Coal/Lignite	MT	446667.933	18691.309	0.000
2	Value of Stock	Rs.	1943646278	233779335	0
B)	QUANTITY				
3	Quantity of Coal/Lignite supplied by Coal/Lignite Company	MT	459623.230	46534.000	0.000
4	Adjustment (+/-) in quantity supplied made by Coal/Lignite Company	MT	-3619.150	0.000	0.000
5	Coal supplied by Coal/Lignite (3+4)	MT	456004.080	46534.000	0.000
6	Normative Transit & Handling Losses (For coal/Lignite based Projects)	MT	3648.033	93.068	0.000
7	Net coal / Lignite Supplied (5-6)	MT	452356.047	46440.932	0.000
C)	PRICE				
8	Amount charged by the Coal/Lignite Company	Rs.	142727870b	656188965	0
9	Adjustment (+/-) in amount charged made by Coal/Lignite Company	Rs.		-35959270	0
10	Handling, Sampling and such other similar charges	Rs.	6,23,65,246.60		
11	Total amount Charged (8+9+10)	Rs.	1489643952	620229695	0
D)	TRANSPORTATION	Rs.			
12	Transportation charges by rail, ship, road transport	Rs.	592308769	0	0
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.			
16	Total Transportation Charges (12+13+14+15)	Rs.	592308769	0	0
17	Total amount Charged for coal/lignite supplied including Transportation (11+16)	Rs.	2081952721	620229695	0
E)	TOTAL COST				
18	Landed cost of coal/ Lignite (2+17)/(1+7)	Rs / MT	4477.74	13111.92	0
19	Blending Ratio (Domestic /Imported)	%	84.64%	15.36%	0.00%
20	Weighted average cost of Coal/ Lignite (Including Biomass)	Rs / MT	5803.95		
20a	Weighted average cost of Coal/ Lignite (Excluding Biomass)	Rs / MT	5803.95		
F)	QUALITY				
21	GCV of Domestic Coal of the opening coal stock as per bill of Coal Company	Kcal/Kg	3683		0
22	GCV of Domestic Coal supplied as per bill of Coal Company	Kcal/Kg	3661		0
23	GCV of Imported Coal of the opening stock as per bill Coal Company	Kcal/Kg		5048	
24	GCV of Imported Coal supplied as perbill Coal Company	Kcal/Kg		5149	
25	Weighted average GCV of coal/ Lignite as Billed (Including Biomass)	Kcal/Kg	3919		
25a	Weighted average GCV of coal/ Lignite as Billed (Excluding Biomass)		3919		
26	GCV of Domestic Coal of the opening stock as received at Station	Kcal/Kg	3669		0
27	GCV of Domestic Coal supplied as received at Station	Kcal/Kg	3682		0
28	GCV of Imported Coal of opening stock as received at Station	Kcal/Kg		5122	
29	GCV of Imported Coal supplied as received at Station	Kcal/Kg		5118	
30	Weighted average GCV of Coal/ Lignite as Received (Including Biomass)	Kcal/Kg	3897		
30a	Weighted average GCV of Coal/ Lignite as Received (Excluding Biomass)	Kcal/Kg	3897		

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited

Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Apr-23	
			HFO	LDO
			M1149201055	M1149200900
A)	**OPENING QUANTITY**			
1	Opening Stock of Oil	(KL)	652.52	952.59
2	Value of Opening Stock	(Rs.)	31606811	80944692.83
B)	**QUANTITY**			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	**PRICE**			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	**TRANSPORATION**			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	**TOTAL COST**			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**84973.22**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**84973.22**
F)	**QUALITY**			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9198.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9239.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	May-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	612.79
2	Value of Opening Stock	(Rs.)	31606811	52070955.55
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**84973.49**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**84973.49**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9198.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9239.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Jun-23	
			HFO	LDO
			M1149201055	M1149200900
A)	**OPENING QUANTITY**			
1	Opening Stock of Oil	(KL)	652.52	234.37
2	Value of Opening Stock	(Rs.)	31606811	19915570.67
B)	**QUANTITY**			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	400.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	400.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	400.00
C)	**PRICE**			
8	Amount charged by Oil Company	(Rs.)	0.00	28601180.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	28601180.00
D)	**TRANSPORATION**			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	28601180.00
E)	**TOTAL COST**			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**76480.14**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**76480.14**
F)	**QUALITY**			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9239.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9240.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Jul-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	450.80
2	Value of Opening Stock	(Rs.)	31606811	34477411.60
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	1000.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	1000.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	1000.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	75507386.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	75507386.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	75507386.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**75809.73**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**75809.73**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9240.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9238.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Aug-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	1120.44
2	Value of Opening Stock	(Rs.)	31606811	84940236.69
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**75809.67**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**75809.67**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9238.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9238.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Sep-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	673.65
2	Value of Opening Stock	(Rs.)	31606811	51069335.20
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**75809.83**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**75809.83**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9238.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9238.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Oct-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	84.35
2	Value of Opening Stock	(Rs.)	31606811	6394829.84
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	2000.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	2000.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	2000.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	188368851.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	188368851.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	188368851.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**93440.94**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**93440.94**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9238.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9187.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Nov-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	32.10
2	Value of Opening Stock	(Rs.)	31606811	2999823.06
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	1000.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	1000.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	1000.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	88662946.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	88662946.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	88662946.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**88811.86**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**88811.86**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9187.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9739.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Dec-23	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	308.21
2	Value of Opening Stock	(Rs.)	31606811	27372966.97
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	1000.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	1000.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	1000.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	79093146.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	79093146.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	79093146.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**81383.01**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**81383.01**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9739.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	NA
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9511.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Jan-24	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	1029.30
2	Value of Opening Stock	(Rs.)	31606811	83767718.74
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**81383.06**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**81383.06**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9739.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	9511.00
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9511.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Feb-24	
			HFO	LDO
			M1149201055	M1149200900
A)	**OPENING QUANTITY**			
1	Opening Stock of Oil	(KL)	652.52	467.25
2	Value of Opening Stock	(Rs.)	31606811	38026518.29
B)	**QUANTITY**			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	1000.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	1000.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	1000.00
C)	**PRICE**			
8	Amount charged by Oil Company	(Rs.)	0.00	79565146.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	79565146.00
D)	**TRANSPORATION**			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	79565146.00
E)	**TOTAL COST**			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**80144.01**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**80144.01**
F)	**QUALITY**			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9511.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	9384.00
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9384.00**

FORM- 15 : Details of Secondary Fuel for Computation of Energy Charges

Name of the Petitioner: NTPC Limited
Name of the Generating Station FGTPS Unchahar

S. No.	Month	Unit	Mar-24	
			HFO	LDO
			M1149201055	M1149200900
A)	OPENING QUANTITY			
1	Opening Stock of Oil	(KL)	652.52	743.90
2	Value of Opening Stock	(Rs.)	31606811	59619511.95
B)	QUANTITY			
3	Quantity of LDO supplied by Oil company	(KL)	0.00	0.00
4	Adjustment(+/-) in qnty.supplied made by Oil Comopany	(KL)	0.00	0.00
5	LDO supplied by Oil company (3+4)	(KL)	0.00	0.00
6	Normative transit & Handling losses	(KL)	0.00	0.00
7	Net Oil supplied (5-6)	(KL)	0.00	0.00
C)	PRICE			
8	Amount charged by Oil Company	(Rs.)	0.00	0.00
9	Adjustment (+/-) in amount charged by Oil Company	(Rs.)	0.00	0.00
10	Handling, Sampling and such other similar charges	(Rs.)	0.00	0.00
11	Total amount Charged (8+9+10)	(Rs.)	0.00	0.00
D)	TRANSPORATION			
12	Transportation charges by rail/ship/road transport	(Rs.)	0.00	0.00
13	Adjustment(+/-) in amount made byRailways/ Transport Company	(Rs.)	0.00	0.00
14	Demurrage Charges, if any	(Rs.)	0.00	0.00
15	Total Transportation Charges (12+13+14+15)	(Rs.)	0.00	0.00
16	Other Charges	(Rs.)	0.00	0.00
17	Total Amount charged for Oil supplied including transportation (11+15+16)	(Rs.)	0.00	0.00
E)	TOTAL COST			
18	**Weighted average cost of Oil**	**(Rs./KL)**	**48438.22**	**80144.53**
19	**Blending Ratio**			**1.00**
20	**Weighted Average Cost of Secondary Fuel/ For the month**	**(Rs./KL)**		**80144.53**
F)	QUALITY			
21	GCV of Domestic Secondary Fuel of the opening stock as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
22	GCV of Domestic Secondary Fuel supplied as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
23	GCV of Imported Secondary Fuel of the opening stock as per bill of Secondary Fuel Company,	Kcal/KL	NA	NA
24	GCV of Imported Secondary Fuel supplied as per bill of Secondary Fuel Company	Kcal/KL	NA	NA
25	Weighted average GCV of Secondary Fuel/ as Billed	Kcal/KL	NA	NA
26	GCV of Domestic Secondary Fuel of the opening stock as received at Station	Kcal/KL	NA	9511.00
27	GCV of Domestic Secondary Fuel supplied as received at Station	Kcal/KL		
28	GCV of Imported Secondary Fuel of opening stock as received at Station	Kcal/KL	NA	NA
29	GCV of Imported Secondary Fuel of supplied as received at Station	Kcal/KL	NA	9384.00
30	**Weighted average GCV of Secondary Fuel/ as Received**	**Kcal/KL**	**NA**	**9384.00**

Computation of Energy Charges

Form-15B
ADDITIONAL FORM

Name of the Company	**NTPC Limited**
Name of the Power Station	**Unchahar Stage-I**

		2024-25	2025-26	2026-27	2027-28	2028-29
No of Days in the year	Days	365	365	365	366	365
Sp. Oil consumption	ml/kwh	0.5	0.5	0.5	0.5	0.5
Auxiliary consumption	%	9.00	9.00	9.00	9.00	9
Heat Rate	Kcal/Kwh	2,415.00	2,415.00	2,415.00	2,415.00	2415.00
Computation of Variable Charges						
Variable Charge (Coal)	p/kwh	441.34658	441.347	441.347	441.347	441.347
Variable Charge (Oil)	p/kwh	4.48335	4.483	4.483	4.483	4.483
Total	p/kwh	445.830	445.830	445.830	445.830	445.830
Price of fuel from Form-15/15A						
Coal Cost	(Rs./MT)	6494.43	6494.43	6494.43	6494.43	6494.43
Oil Cost	(Rs./KL)	81596.96	81596.96	81596.96	81596.96	81596.96
Coal GCV (After Adjustment)	(kCal/Kg)	3897.59	3897.59	3897.59	3897.59	3897.59
Oil GCV	(Rs./KL)	9345.67	9345.67	9345.67	9345.67	9345.67
Computation of Fuel Expenses for Calculation of IWC:						
ESO in a year	(MUs)	2778.90	2778.90	2778.90	2786.51	2778.90
Cost of coal for 40 Days	(Rs. Lakh)	16800.79	16800.79	16800.79	16800.79	16800.79
Cost of oil for 2 months	(Rs. Lakh)	207.65	207.65	207.65	208.22	207.65
Energy Expenses for 45 days	(Rs. Lakh)	15274.32	15274.32	15274.32	15274.32	15274.32
Rate of Energy Charge from	$= (Q_s)_n \times P_s$	4.079847875	4.079847875	4.079847875	4.079847875	4.079847875
Heat Contribution from SFO / Alternate Fuel	$= (Qs)_n \times (GCV)_s$	4.672833333	4.672833333	4.672833333	4.672833333	4.672833333
Heat Contribution from coal	$= GHR - H_s$	2,410.33	2,410.33	2,410.33	2,410.33	2,410.33
Specific Primary Fuel Consumption	$= H_p / (GCV)_p$	0.62	0.62	0.62	0.62	0.62
Rate of Energy charge from Primary Fuel (p/kwh)	$(REC)_p$	401.63	401.63	401.63	401.63	401.63
Rate of Energy charge ex-bus (p/kWh)	$= ((REC)_s + (REC)_p / (1-(AUX))$	445.83	445.83	445.83	445.83	445.83

PETITIONER

PART 1
FORM- L

Name of the Petitioner: NTPC Limited
Name of the Generating Station: Unchahar Stage-I

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

(Amount in Rs. Lakh)

S. No.	Particulars	As on 01.04.2024		
		Accrual Basis	Un-discharged Liabilities	Cash Basis
A	a) Opening Gross Block Amount as per books	132676.02	705.94	131970.09
	b) Amount of IDC in A(a) above	432.20	0.00	432.20
	c) Amount of FC in A(a) above	0.00	0.00	0.00
	d) Amount of FERV in A(a) above	813.73	0.00	813.73
	e) Amount of Hedging Cost in A(a) above	0.00	0.00	0.00
	f) Amount of IEDC in A(a) above	0.00	0.00	0.00
B	a) Addition in Gross Block Amount during the period (Direct purchases)	To be provided at the time of truing-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 Limited
Name of the Generating Station Unchahar Stage-I

Statement of Capital Woks in Progress

(To be given for relevant dates and year wise)

(Amount in Rs. Lakh)

S. No.	Particulars	01.04.2024		
		Accrual Basis	Un-discharged Liabilities	Cash Basis
A	a) Opening CWIP as per books	9607.52	1253.58	8353.93
	b) Amount of IDC in A(a) above	0.00		0.00
	c) Amount of FC in A(a) above	0.00		0.00
	d) Amount of FERV in A(a) above	0.00		0.00
	e) Amount of Hedging Cost in A(a) above	0.00		0.00
	f) Amount of IEDC in A(a) above	0.00		0.00
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	To be provided at the time of truing-up		
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			

(Petitioner)

PART-I
FORM- N

Calculation of Interest on Normative Loan

Name of the Company :	**NTPC Limited**
Name of the Power Station :	**Unchahar Stage-I**

(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	48,463.95	48,680.60	48,680.60	48,742.20	50,133.03	52,051.03
2	Cumulative repayment of Normative loan up to previous year	48,458.86	48,497.22	48,680.60	48,720.20	49,653.91	51,781.01
3	**Net Normative loan – Opening**	5.09	183.39	-	22.00	479.13	270.02
4	Add: Increase due to addition during the year / period	554.42	-	61.60	1,390.83	1,918.00	981.47
5	Less: Decrease due to de-capitalisation during the year / period	341.20	0.00	0.00	0.00	0.00	0.00
6	Less: Decrease due to reversal during the year / period						
7	Add: Increase due to discharges during the year / period	3.44	0.00	0.00	0.00	0.00	0.00
8	Less: Repayment of Loan(8A-8B)	38.36	580.18	39.60	933.71	2127.11	1863.95
8A	Repayment of Loan	379.56	580.18	39.60	933.71	2127.11	1863.95
8B	Repayment Adj- Decap	341.20	0.00	0.00	0.00	0.00	0.00
11	**Net Normative loan - Closing**	183.39	-	22.00	479.13	270.02	-
12	**Average Normative loan**	94.24	91.69	11.00	250.56	374.57	135.01
13	Weighted average rate of interest	7.7752	7.7770	7.7443	7.7244	7.6783	7.6088
14	**Interest on Loan**	**7.33**	**7.13**	**0.85**	**19.35**	**28.76**	**10.27**
15	Cumulative repayment of Normative loan at the end of the period after adjustments	48,497.22	49,077.39	48,720.20	49,653.91	51,781.01	53,644.96

(Petitioner)

PART 1
FORM- O

Calculation of Interest on Working Capital

Name of the Company :	NTPC Limited
Name of the Power Station :	Unchahar Stage-I

(Amount in Rs Lakh)

S. No.	Particulars	Existing 2018-19	2024-25	2025-26	2026-27	2027-28	2028-29
1	2	3	4	5	6	7	8
1	Cost of Coal/Lignite	18,891.97	16800.79	16800.79	16800.79	16800.79	16800.79
2	Cost of Main Secondary Fuel Oil	205.11	207.65	207.65	207.65	208.22	207.65
3	Fuel Cost						
4	Liquid Fuel Stock						
5	O & M Expenses	1,492.11	1754.56	1817.66	1893.13	1973.40	2058.53
6	Maintenance Spares	3,581.06	4210.95	4362.39	4543.51	4736.16	4940.47
7	Receivables	20,732.23	19231.23	19261.05	19499.50	19778.14	19901.27
8	Total Working Capital	44902.48	42205.17	42449.55	42944.57	43496.71	43908.72
9	Rate of Interest	12.0000	11.9000	11.9000	11.9000	11.9000	11.9000
10	**Interest on Working Capital**	**5388.30**	**5022.42**	**5051.50**	**5110.40**	**5176.11**	**5225.14**

Petitioner

PART 1
FORM-T

Summary of issue involved in the petition

	Name of the Company :	**NTPC Limited**
	Name of the Power Station :	**Unchahar Stage-I**
1	**Petitioner:**	**NTPC Limited**
2	**Subject: Approval of tariff of Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 MW) from 01.04.2024 to 31.03.2029.**	
3	**Prayer:** i) Approve tariff of Unchahar-I 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 reimbursement of Ash utilization Charges directly from the beneficiaries on monthly basis, subject to true up. iv) Allow the recovery of pay/wage revision as additional O&M over and above the normative O&M. v) Pass any other order as it may deem fit in the circumstances mentioned above.	
4	**Name of Respondents**	
	1.Uttar Pradesh Power Corp. Ltd (UPPCL)	
	2.Uttarakhand Power Corporation Ltd (UPCL)	
	3.Tata Power Delhi Distribution Ltd (TPDDL)	
	4.BSES Rajdhani Power Ltd (BRPL)	
	5.BSES Yamuna Power Ltd (BYPL)	
	6.Haryana Power Purchase Centre. (HPPC)	
	7.Gujarat Urja Vikas Nigam Ltd.(GUVNL)	
	8. Electricity Department (Chandigarh)	
	9.Power Development Department (PDD-J&K)	

5	**Project Scope : Feroze Gandhi Unchahar Thermal Power Station Stage-I (420 MW)**					
	Cost: Approved Capital Cost of Rs 96265.33 Lakh as on 31.03.2024					
	Commissioning : Station COD on 13.02.1992					
	Claim	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
	AFC (in Rs Lakh)	**96,377.39**	**96,465.39**	**98,452.29**	**1,01,192.29**	**1,02,594.39**
	Capital cost (in Rs Lakh)	**34,445.27**	**36,609.94**	**36,851.86**	**38,785.90**	**41,146.08**
	Initial spare (in Rs Lakh)	included in above				
	NAPAF (Gen) (in %)	**83**				
	Any Specific					

Honeywell Automation India Limited
53, 54, 56 & 57 Hadapsar Industrial Estate,
Hadapsar, Pune-411013

Tel. : 91-20-66039513
Fax : 91-20-66039600

www.honeywellautomationindia.com

23-Feb-2022

Kind Atten:
To,
Shri Somnath Kundu
Alternate CISO, DGM
PE-C&I, NTPC CC EOC
NTPC LIMITED

Subject: Operational Risks from Running Unsupported Microsoft® Windows™ 2008 Server R2 & Windows™ 7 or Earlier Operating Systems

For:- Upgradation against obsolescence of HMI of M/s. Honeywell along with Cyber Security Suite in
Ramagendam Unit 4,5, offsite Station LAN,
Unchahar Unit 1,2
Singrauli Stage I & II,
Talcher Unit 4,5 &6
Bongaigaon unit 1,2,3 & subunits

Dear Sir,

Hope you all are safe and doing well.

This is regarding the subject matter, as you are aware, **after January 14, 2020**, Microsoft discontinued its support for systems running on Microsoft® Windows™ Server 2008 R2 & Windows™ 7. This means that while the operating system may continue to operate beyond the end of life date, ***Microsoft will not release new security updates, security hot fixes, provide technical phone support, or online technical content updates.*** Without this support, the Microsoft Windows Server 2008 R2 & Windows 7 operating system could become increasingly vulnerable to cyber security risks; in the event a system is exploited, there is **no support available for remediation or repair.**

Who is impacted?

1. The Microsoft Operating Systems used with the Experion PKS R43x & below releases
2. Advanced Applications not running on Windows 10 or Windows Server 2016 or latest
3. Any Microsoft OS other than Windows 10 and Server 2016 or latest on PCs connected to auxiliary equipment that is connected to Experion, such as PLCs, Analyzers, etc.

Microsoft have ceased the development of all security patches for Windows 7 and Server 2008 R2. There will be no further support. Without this support,

1. Attackers are likely to target systems running Windows 7 and Windows Server 2008R2 on the first day support ends
2. More vulnerabilities will be uncovered and exploited.
3. If a system is exploited, there will be no support options available for remediation or repair!
4. Troubleshooting will become difficult and can't get the root cause analysis.

What happens after January 14, 2020	Implications
New workstation hardware will not be available	1. In case of complete HW failure workstations will become and remain non-operational 2. Cannot add new operator stations/license addition on account of plant expansions

Hardware spare availability and support will decline over time	In case of any HW failure – will have no resolution due to unavailability of spares
Updates/Fixes for 3rd party vendor e.g. driver updates etc. may not be available	No resolution in case of failures
OS Patches will not be available	Running unpatched systems, significantly increases cyber security risks

Future path forward and support modality –

Honeywell monitors risk to its open systems and strives to offer customers beneficial paths forward. To reduce the risks of unplanned downtime, Honeywell has developed system modernization solutions to address Microsoft Windows 2008 Server R2 & Windows 7 support discontinuation and to help you better protect your system.

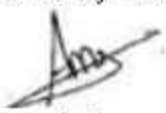
Currently installed hardware and software are obsolete and no more available; hence we will be severely constraint to support the existing system. Failure of these HMI's and its subassembly may create plant disturbance which result into plant tripping and unforeseen shutdown. In view of above, we will not be able to support / take any responsibility of failures, modification requirements, additions etc on unsupported system. We recommend that upgradation to be undertaken on urgent priority to ensure smooth operation of the system and so the plant. Honeywell will not be able to assume any responsibility towards any failures due to obsolescence and unsupported platform. It is highly recommended to utilize the system on supported configuration and licensing in order to avoid any major incident to the system and also effectively to the plant.

Honeywell recommend upgrading the hardware and software to latest Experion release of R5xx platform compatible with latest operating system.

Please feel free to contact us for any further clarification and we will be glad to explain in detail on the path forward & support planning.

Thanking you and assuring our best services at all time.

Yours truly,
For Honeywell Automation India Limited,



Amey Latkar
(HPS- Lifecycle Solution & Services)

SHINKAWA

SHINKAWA Electric Co., Ltd.
Shinkojimachi Building 3F, 4-3-3 Koji-machi, Chiyoda-ku, Tokyo 102-0083 Japan
TEL +81-3-3263-4417 FAX +81-3-3262-2171

November 19, 2017

VM-7 Monitor Series – End of Sale Notification

Dear Valued Partners,

Thank you for your interest in our products. This letter is to notify you that Shinkawa has discontinued the VM-7 series monitor, see below for a full list of model codes affected. Shinkawa customers have either transitioned to the VM-7B series or are in the process of transitioning.

VM-76x Monitor Rack	VM-732 Phase Marker 4ch Analysis Module
VM-75xx Power Supply	VM-771 MCL View Software
VM-741 Comm. & Phase Marker	VM-772 Field Config. Software
VM-742 Host Network Comm.	VM-773 infiSYS Analysis View Software
VM-701 Vib. & Displacement	VM-774 Remote View Station Software
VM-701 Absolute Vib.	VM-775 SQL Transfer Software
VM-703 Tacho & Eccentricity	VM-776 Convert Programme
VM-704 Temperature	VM-781 Diagnosis Programme for VM-773
VM-706 Rod Drop	VM-782 DCS Modbus Comm. Software
VM-721 18 Ch. Replay	VZ-72 Blank Panels
VM-732 Analysis Module	VZ-74 Configuration File

Orders will be accepted until September 30, 2018
Last order ship date is November 30, 2018
End of Service is November 30, 2023

Please note, many components have become unavailable; therefore, we apologize for not being able to fulfil your order per our End of Service date.

Sincerely,

Sensor Technology Department
Shinkawa Electric Co., Ltd.

Att. 1. VM-7 and VM-7B terminal block/connector wiring comparison table, connector location drawing/product-wise applicable devices.
Att. 2. Product-wise firmware table.

PROJECT: UPGRADATION OF HMI FOR UNIT#1, UNIT#2 AND COMMON.

Inquiry Reference	: Mail from NTPC Dated 26th April 2018
Inquiry Date	: 26.04.2018
Offer Reference	: YIL/CVP/BC18041810/P/AG/R0
Offer Date	: 30.04.2018
Prepared by	: Rajan T
System Contact	: Garg Avnish Ashwani

Yokogawa India Ltd
No 96, Electronic city
Hosur Road
Bangalore – 560 100
Land Line: 080-41586000
avnish.garg@in.yokogawa.com

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1 INTRODUCTION

The NTPC FEROZE GANDHI UNCHAHAR THERMAL POWER STATION STAGE-I (NTPC FGUTPS) – 2 X 210 MW Project consists of Centum CS3000 Distributed Control System (DCS)

The DCS Operator Station/ Engineering stations/ Other Server/ SPC's are running on Windows XP

The Existing version of Station C&I- DDCMIS is Centum CS3000 – R3.08 for DDCMIS.

As Windows XP is no longer supported by Microsoft which has resulted in Windows XP installations open for security risks and also, the possibility of related companies such as PC manufacturers not providing any spares/ replacements for Windows XP machines which has necessitated the upgrade of Windows XP to the latest supported Windows platform on which the DDCMIS is compatible i.e Windows 10

DDCMIS Unit 1, Unit 2 and Common - Upgrade to Windows 10 / Server 2008R2:

The Upgrade to Windows 10 Enterprise version, operating system would require the DCS System software to be upgraded to the latest version i.e Centum VP-R6 .The Operating system (OS) would be Windows 10 on the workstations and Windows Server 2008 R2 on the servers. As the existing PC/ Server hardware is not compatible with this latest OS, the Workstation & Server hardware would require to be replaced by latest machines.

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2 REFERRED DOCUMENTS

Rev	Issue Date	Description
		System Configuration Drawing (Drawing No. 1420-415-PVI-L-001)
		Bill of Material (Drawing No. 1420-415-PVI-H-001)

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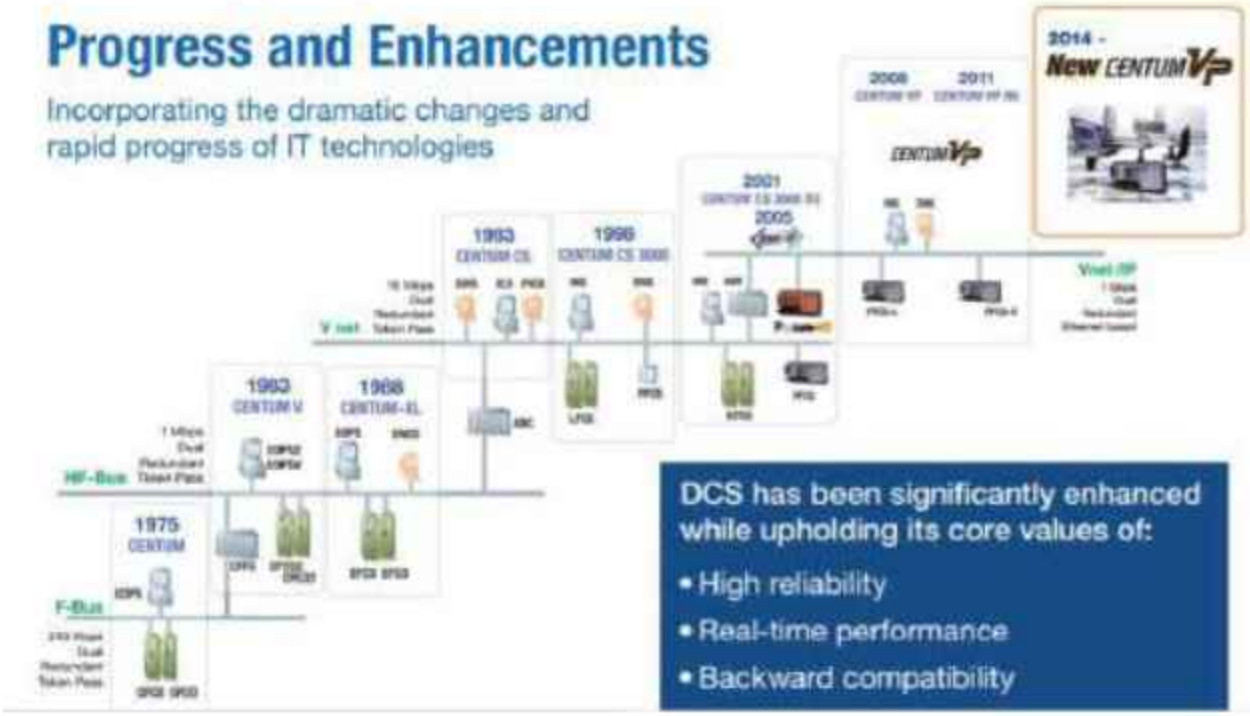
3 CENTUM VP HMI DESCRIPTION

Yokogawa's Distributed Control System - CENTUM - was released in 1975 as the first real Distributed Control System (DCS) in the world. Since then, it has been continuously enhanced and upgraded, incorporating state-of-the-art technology maintaining continuities and backward compatibility of the system. Based on our 40-year DCS experience, Yokogawa is proud to develop and introduce the new CENTUM VP system.



CENTUM VP is the next evolutionary step of Yokogawa control system with better information visibility, performance foresight, and operational agility.

The adaptive evolution of the new CENTUM VP focuses on addressing customer's needs to keep up with the fast pace of change in the business landscape and technology while delivering maximum return on assets and the lowest total cost of ownership. This R6-level of the CENTUM VP brings together smart engineering, advanced operation, system agility and sustainable plant. With CENTUM VP R6, plant operators can be assured of an optimum engineering environment that spans the entire plant lifecycle, from plant design

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and the engineering and installation of systems and devices to the start-up of production, maintenance, and renovation. In addition, it is designed to meet the most stringent industry requirements for safe and reliable plant operations and environmental protection.

CENTUM VP achieves the Operational Excellence that is the focus of Yokogawa's Production Excellence, Safety Excellence and Asset Excellence initiatives. It offers integrated viewing and data handling functions. For example, alarms from the ProSafe-RS Safety Instrumented System and Plant Resource Manager, Yokogawa's Asset Management product, can be seen and handled seamlessly in the Human Interface Station (HIS). All plant process data and device data are handled by CENTUM VP.

Yokogawa offers an intuitive and easy-to-understand HMI environment for plant operation and monitoring, which is the result of vast experience with CENTUM systems in operation. Flexibility in displaying operation windows and monitors helps in adapting to various aspects of operation needs. CENTUM VP provides easy-to understand graphics based on the ergonomics and knowledge engineering. For instance, data displays are provided with high visibility that enables intuitive awareness of the situation. The use of colors considers the best contrast and environments of the central control room and the configuration of the displays integrates the knowhow of experienced operators. With all these functions, CENTUM VP enables operators to make quick and accurate decisions during operations and contributes to improve operation efficiency.

Yokogawa enhanced the functions of the Human Interface Station (HIS) for CENTUM VP. While maintaining full compatibility with the CENTUM CS 3000, the new CENTUM VP HMI introduces a unified and intuitive operating environment. The new screens are ergonomically designed and arranged to reduce operator fatigue and discomfort. The HMI is also designed to facilitate easy access to the right information.

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System message banner

Continuously displays the latest alarm messages, keeping operators up to date on process conditions.

Browser bar

Contains navigation tools for the convenience of operators, frequently-used icons can be grouped in a My Favorites folder.

Window history

Lists the previous operational displays. Operators can quickly call up previously-used graphics windows

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4 PROPOSAL CONSIDERATIONS

The considerations for this upgrade proposal are listed below

1. The existing system network – Vnet/IP will be retained and the proposed workstations will be connected to the existing network

2. The existing Field Control stations for DDCMIS i.e., Field Control station for DDCMIS will be retained. Also, the field termination cabinets, marshalling cabinets, relay cabinets, network switch cabinets, Power distribution cabinets and all the hardware located in these cabinets for both DCS and SCS systems will be retained

3. The existing UPS / mini UPS for providing Power/ backup to the workstations (as existing) will be retained and used for powering the proposed new workstations

4. The existing printers / scanners will be retained and used to connect with the proposed new workstations

5. The existing operator desks, control desks printer tables, furniture will be retained

6. Existing large video screens will be retained.

7. Existing networking accessories / elements will be retained except the network switches will be replaced

8. Existing Power cables etc used for connectivity, powering the system will be retained

5 UPGRADATION SHUTDOWN REQUIREMENTS:

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The HMI up-gradation can be taken up online one HIS at a time if allowed by operations. The envisaged time for each operator station upgrade would be 1/2 a day with pre-changeover preparation.

Alternatively if online upgrade is not possible as per operations, up gradation can be done during shutdown. In this case the up gradation time required would be a maximum of 7-10 days per unit with pre-shutdown preparation.

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6 SCOPE OF SUPPLY / SERVICES, EXCLUSIONS AND TERMINAL POINTS

1.0 **The following supplies are included in this proposal :**

1.1 Human –Machine Interface and Plant Information system (HMIPIS for Distributed Control system (DCS) for:

a. DDCMIS for Unit 1
b. DDCMIS for Unit 2
c. Station LAN and common system as mentioned in the Bill of material enclosed
d. Mandatory Spares as per BOM

2.0 **The following Services are included in this proposal :**

2.1 Installation Testing & Commissioning of the equipment covered under this proposal are based on per-diem rates.

3.0 **The following are EXCLUDED from the scope of this proposal, unless specifically confirmed and agreed to at a later date.**

a. Controller Subsystem including I/O cards, termination modules, prefab cables, cabinets. etc. as existing will be retained and any new hardware is excluded.
b. System Communication network including Switches
c. UPS / mini UPS for providing backup to the workstations
d. Printers / scanners
e. Operator desks/ consoles, Printer tables, Furniture including chairs
f. Networking accessories / elements
g. Large Video screens
h. Power cables etc. will be retained as existing
i. Station LAN connected PCs

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 Annexure-A2

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
सूचना प्रौद्योगिकी एवं साइबर सुरक्षा प्रभाग
Information Technology & Cyber Security Division
****

विषय : CEA (Cyber Security in Power Sector) Guidelines, 2021.

CEA is mandated to prepare 'Guidelines on Cyber Security' in Power Sector under the provision of regulation (10) of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019. Guidelines on Cyber Security in Power Sector incorporating the cardinal principles has been prepared by CEA. In compliance to the provision of the above regulation, **CEA (Cyber Security in Power Sector) Guidelines, 2021** are issued for compliance by all entities listed in the clause 2.3 (Applicability of the Guidelines) of the guidelines.

Encl: Guidelines on Cyber Security

27/10/21
(V.K Mishra)
Secretary CEA

CEA (Cyber Security in Power Sector) Guidelines, 2021

1.0 Background

1.1 Cyber intrusion attempts and Cyber-attacks in any critical sector are carried out with a malicious intent. In Power Sector it's either to compromise the Power Supply System or to render the grid operation in-secure. Any such compromise, may result in mal-operations of equipments, equipment damages or even in a cascading grid brownout/blackout. The much hyped air gap myth between IT and OT Systems now stands shattered. The artificial air gap created by deploying firewalls between any IT and OT System can be jumped by any insider or an outsider through social engineering. Cyber-attacks are staged through tactics & techniques of Initial Access, Execution, Persistence, Privilege Escalation, Defence Evasion, Command and Control, Exfiltration. After gaining the entry inside the system through privilege escalation, the control of IT network and operations of OT systems can be taken over even remotely by any cyber adversary. The gain of sensitive operational data through such intrusions may help the Nation/State sponsored or non-sponsored adversaries and cyber attackers to design more sinister and advanced cyber-attacks.

1.2 Government of India has set up the Indian Computer Emergency Response Team (CERT-In) for Early Warning and Response to cyber security incidents and to have collaboration at National and International level for information sharing on mitigation of cyber threats. CERT-In regularly issues advisories on safeguarding computer systems and publishes Security Guidelines which are widely circulated for compliances. All Central Government Ministries/ Departments and State/Union Territory Governments have been advised to conduct cyber security audit of their entire Cyber Infrastructure including websites at regular interval through CERT-In empanelled Auditors so as to identify gaps and appropriate corrective actions to be taken in cyber security practices. CERT-In extends supports to enable Responsible Entity in conducting cyber security mock drills and in assessment of their preparation to withstand cyber-attacks. The Responsible Entity must submit Reports of Cyber Audit of cyber security controls, architecture, vulnerability management, network security and periodic cyber security drills to sectoral CERT as well as CERT-In. Team of experts shall review these reports and shortcomings if any in the compliances shall be flagged by them. CERT-In on regular basis also conducts workshops and training programs to enhance Cyber awareness of all Stakeholders.

1.3 Ministry of Power has created 6(six) sectoral CERTs namely Thermal, Hydro, Transmission, Grid Operation, RE and Distribution for ensuring cyber security in Indian Power Sector. Each Sectoral CERT has prepared their sub-sector specific model Cyber Crisis Management Plan(C-CMP) for countering cyber-attacks and cyber terrorism. Each Sectoral CERT has circulated their model C-CMPs for preparation and implementation of organization specific C-CMP by each of their Constituent Utility.

1.4 All Responsible Entities, Service Providers, Equipment Suppliers/Vendors and Consultants engaged in Power Sector are equally responsible for ensuring cyber security of the Indian Power Supply System. They are to act timely upon each threat intelligence,

advisories and other inputs received from authenticated sources, for continuous improvement in their cyber security posture.

1.5 In the current Indian scenario though many cyber security directives and guidelines exists, but none of them are power sector specific. Ministry of Power has directed CEA to prepare Regulation on Cyber Security in Power Sector. And as an interim measures CEA has been directed to issue Guideline on Cyber Security in Power Sector, under the provision of Regulation 10 on Cyber Security in the "Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019".

1.6 The Guidelines on Cyber Security, in the form of Articles written below, requires mandatory Compliance by all Responsible Entities. The Guidelines shall come into effect from the date of issue by Central Electricity Authority, New Delhi.

2.0 Hereby the Guidelines on Cyber Security are drawn in the form of Articles for compliance by the Requester as well as User under the following provision of Regulation 10 on Cyber Security, in the "Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019".

"The requester and the user shall comply with cyber security guidelines issued by the Central Government, from time to time, and the technical standards for communication system in Power Sector laid down by the Authority."

2.1 **Objective of issuing Guideline**:

a) Creating cyber security awareness
b) Creating a secure cyber ecosystem,
c) Creating a cyber-assurance framework,
d) Strengthening the regulatory framework,
e) Creating mechanisms for security threat early warning, vulnerability management and response to security threats,
f) Securing remote operations and services,
g) Protection and resilience of critical information infrastructure,
h) Reducing cyber supply chain risks,
i) Encouraging use of open standards,
j) Promotion of research and development in cyber security,
k) Human resource development in the domain of Cyber Security,
l) Developing effective public private partnerships,
m) Information sharing and cooperation
n) Operationalization of the National Cyber Security Policy

2.2 Within the text of these Articles, **'Responsible Entity'** shall mean all:

a) Transmission Utilities as well as Transmission Licensees,
b) Load despatch centres (State, Regional and National),
c) Generation utilities (Hydro, Thermal, Nuclear, RE),
d) Distribution Utilities
e) Generation Aggregators,
f) Trading Exchanges,
g) Regional Power Committees, and
h) Regulatory Commissions.

2.3 **Applicability:**

All Responsible Entities as well as System Integrators, Equipment Manufacturers, Suppliers/Vendors, Service Providers, IT Hardware and Software OEMs engaged in the Indian Power Supply System.

2.4 **Scope:**

2.4.1 **Control Systems for System Operation and Operation Management.**

a) Grid Control and Management Systems,
b) Power Plant Control Systems,
c) Central Systems used to monitor and control of distributed generation and loads e.g. virtual power plants, storage management, central control rooms for hydroelectric plants, photovoltaic/wind power installations,
d) Systems for fault management and work force management,
e) Metering and measurement management systems,
f) Data archiving systems,
g) Parameterisation, configuration and programming systems,
h) Supporting systems required for operation of the above mentioned systems,

2.4.2 **Communication System.**

a) Routers switches and firewalls,
b) Communication technology-related network components,
c) Wireless digital systems.
d) Control Centre to Control Centre Communications for data exchange on ICCP. **(IEC 61850/60850-5/TASE.2/)**

2.4.3 **Secondary, Automation and Tele control technologies**

a) Control and Automation components,
b) Control and field devices,
c) Tele control devices,
d) Programmable logic controllers / Remote Terminal Units, including digital sensor and actuators elements,
e) Protection devices,
f) Safety components,
g) Digital measurement and metering installations,
h) Synchronisation devices,
i) Excitation Systems,

3.0 Definition of Terms:

1. **Access Management**: shall mean set of policies and procedures of the Responsible Entity for allowing Personnel, devices and IoT to securely perform a broad range of operational, maintenance, and asset management tasks either on site or remotely as laid down in Clause 5.2.5 of IS 16335.
2. **Accreditation:** shall mean the process of verifying that an organisation is capable of conducting the tests and assessments against a product/process that are required to be certified.

3. **Accreditation Body:** shall mean an organisation that has been accredited to verify the credentials and capabilities of the organisations that wish to become a certification body.
4. **Act:** shall mean the Information Technology Act, 2000 (21 of 2000)
5. **Asset**: shall mean anything that has value to the organization.
6. **Certification:** shall mean the process of verifying that a product has been manufactured in conformance with a set of predefined standards and/or regulations by an organisation, that is accredited to conduct the certification process
7. **Certification Body:** shall mean an organisation that has been accredited by an accreditation body to certify products / process against a certification scheme.
8. **Certification Scheme:** shall mean the processes, paperwork, tools, and documentation that define how a product or manufacturer is certified
9. **Chief Information Security Officer:** shall means the designated employee of Senior management level directly reporting to Managing Director/Chief Executive Officer/Secretary of the Responsible Entity, having knowledge of Information Security and related issues, responsible for cyber security efforts and initiatives including planning, developing, maintaining, reviewing and implementation of Information Security Policies
10. **Critical Assets:** shall mean the facilities, systems and equipment which, if destroyed, degraded or otherwise declared unavailable, would affect the reliability or operability of the Power Supply System.
11. **Critical System:** shall mean cyber assets essential to the reliable operation of critical asset. Critical System consists of those cyber assets that have at least one of the following characteristics:
    a) The cyber asset uses a routable protocol to communicate outside the electronic security perimeter.
    b) The cyber asset uses a routable protocol within a control centre.
    c) The cyber asset is dial-up accessible.
12. **Critical Information Infrastructure:** shall mean Critical Information Infrastructure as defined in explanation of sub-section (1) of Section 70 of the Act.
13. **Cyber Assets**: shall mean the programmable electronic devices, including the hardware, software and data in those devices that are connected over a network, such as LAN, WAN and HAN.
14. **Cyber Crisis Management Plan:** shall mean a framework for dealing with cyber related incidents for a coordinated, multi-disciplinary and broad-based approach for rapid identification, information exchange, swift response and remedial actions to mitigate and recover from malicious cyber related incidents impacting critical processes.
15. **Cyber Security Breach**: shall mean any cyber incident or cyber security violation that results in unauthorized or illegitimate access or use by a person as well as an entity, of data, applications, services, networks and/or devices through bypass of the underlying cyber security protocols, policies and mechanisms resulting in the compromise of the confidentiality, integrity or availability of data/information maintained in a computer resource or cyber asset.
16. **Cyber Security Incident:** shall mean any real or suspected adverse cyber security event that violates, explicitly or implicitly, cyber security policy of Responsible Entity resulting in unauthorized access, denial of service or disruption, unauthorized use of computer resource for processing or storage of information or changes to data or information

without authorization, leading to harm to the power grid or its critical sub-sectoral elements Generation, Transmission and Distribution.

17. **Cyber Security Policy:** shall mean documented set of business rules and processes for protecting information, computer resources, networks, devices, Industrial Control Systems and other OT resources.
18. **Electronic Security Perimeter:** shall mean the logical border surrounding a network to which the Cyber Systems of Power Supply System are connected using a routable protocol.
19. **Information Security Division:** shall mean a division accountable for cyber security and protection of the Critical System of the Responsible Entity.
20. **Protected System:** shall mean any computer, computer system or computer network of the Responsible Entity notified under section 70 of the Act, in the official gazette by appropriate Government.
21. **Security Architecture:** shall mean a framework and guidance to implement and operate a system using the appropriate security controls with the goal to maintain the system's quality attributes like confidentiality, integrity, availability, accountability and assurance.
22. **Vulnerability:** shall mean intrinsic properties of something resulting in susceptibility to a risk source that can lead to an event with a consequence
23. **Vulnerability Assessment:** shall mean a process of identifying and quantifying vulnerabilities

4.0 Standards

Reference	Description
ISO/IEC 15408	Common Criteria Certification Standard
ISO/IEC 17011	General requirements for accreditation bodies accrediting conformity assessment bodies
ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
ISO/IEC 21827	Systems Security Engineering - Capability Maturity Model (SSE-CMM)
ISO/IEC 24748-1	Systems and software engineering — Life cycle management — Part 1: Guidelines for life cycle management.
ISO 27001/2	Information Security Management
ISO/ IEC 27019	Information technology — Security techniques — Information Security controls for the energy utility industry
ISO/IEC 61508	Functional Safety of Electrical / Electronic / Programmable Electronic Safety-related Systems
IEC 61850	Communication networks and systems for power utility automation
IEC 62351	Standards for Securing Power System Communications
IEC 62443	Cyber Security for Industrial Control Systems
IS 16335	Power Control Systems – Security Requirements.

5.0 Abbreviations

Abbreviations		Description
a)	BES	Bulk Electric System

b)	CDAC	Centre for Development of Advanced Computing
c)	CEA	Central Electricity Authority
d)	CERC	Central Electricity Regulatory Commission
e)	CERT	Computer Emergency Response Team
f)	CERT-In	Indian Computer Emergency Response Team
g)	CII	Critical Information Infrastructure
h)	CISO	Chief Information Security Officer
i)	CSK	Cyber Swachhta Kendra
j)	COTS	Commercial off-the Shelf
k)	ESP	Electronic Security perimeter
l)	ICS	Industrial Control Systems
m)	ICT	Information and Communications Technology
n)	IEC	International Electro Technical Commission
o)	ISAC	Information Sharing and Analysis Centre
p)	ISD	Information Security Division
q)	ISO	International Organization for Standardization
r)	ISMS	Information Security Management System
s)	IT	Information Technology
t)	FAT	Factory Acceptance Test
u)	NABL	National Accreditation Board for Testing and Calibration Laboratories
v)	NCIIPC	National Critical Information Infrastructure Protection Centre
w)	NLDC	National Load Dispatch Centre
x)	NPTI	National Power Training Institute
y)	NSCS	National Security Council Secretariat
z)	OEM	Original Equipment Manufacturer
aa)	OT	Operational Technology
bb)	RLDC	Regional Load Dispatch Centres
cc)	SAT	Site Acceptance Test
dd)	SERC	State Electricity Regulatory Commission
ee)	SCADA	Supervisory Control and Data Acquisition Systems
ff)	SIEM	Security Information and Event Management
gg)	SLA	Service Level Agreement
hh)	SLDC	State Load Dispatch Centre
ii)	QCI	Quality Council of India

CEA (Cyber Security in Power Sector) Guidelines, 2021

Article 1. Cyber Security Policy.

a. Cardinal Principles: The Responsible entity will strictly adhere to following cardinal principles while framing cyber security policy:

i. There is hard isolation of their OT Systems from any internet facing IT system.

ii. May keep only one of their IT systems with internet facing at any of their site/location if required which is isolated from all OT zones and kept in a separate room under the security and control of CISO.

iii. Downloading/Uploading of any data/information from their internet facing IT system is done only through an identifiable whitelisted device followed by scanning of both for any vulnerability/malware as per the SOP laid down and for all such activities digital logs are maintained and retained under the custody of CISO for at least 6 months. The log shall be readily to carry out the forensic analysis if asked by investigation agency.

iv. List of whitelisted IP addresses for each firewall is maintained by CISO and each firewall is configured for allowing communication with the whitelisted IP addresses only.

v. Communication between OT equipment/systems is done through the secure channel preferably of POWERTEL through the fibre optic cable. Security configuration of the communication channel is also to be ensured.

vi. All ICT based equipment/system deployed in infrastructure/system mandatorily CII are sourced from the list of the "Trusted Sources" as and when drawn by MoP/CEA.

b. The Responsible Entity shall be ISO/IEC 27001 certified (including sector specific controls as per ISO/IEC 27019).

c. The Responsible Entity shall have a Cyber Security Policy drawn upon the guidelines issued by NCIIPC.

d. The Responsible Entity shall ensure annual review of their Cyber Security Policy by subject matter expert and changes shall be made therein only after obtaining the due approval from Board of Directors.

e. The process of Access Management for all Cyber Assets owned or under control of the Responsible Entity shall be detailed in the Cyber Security Policy.

f. The Cyber Security Policy shall leverage state-of-art cyber security technologies and relevant processes at multiple layers to mitigate the cyber security risks.

g. The Responsible Entity shall be solely responsible to get Cyber Security Policy implemented through its Information Security Division (ISD).

h. The CISO shall record the reason(s) for exemption required, if any, in case, unable to comply with any of the provision(s) of the Cyber Security Policy. Any exception shall be allowed only after an approval of provisions of compensatory control(s) to mitigate residual cyber security risks.

i. The CISO shall record the exemptions sought in statement of applicability controls, while getting the ISO 27001 certified. All exemptions and its justification need to be in conformance with Cyber Security Policy of the Responsible Entity.
j. The Responsible Entity shall allocate sufficient Annual budget for enhancing cyber security posture, enhanced year over year.
k. The Responsible Entity shall work in collaboration with other Industry Stakeholders as well as Academia to promote R&D activity in the domain of cyber security.
l. The Responsible Entity shall ensure that cyber security issues are taken up as agenda items in their Board meetings once in every three months.

Article 2 Appointment of CISO.

a) The Responsible Entity shall mandatorily appoint a CISO and shall confirm to qualification, if any, **laid** by Quality Council of India (QCI). In absence, the work of CISO shall be looked upon by Alternate CISO. In case qualification for appointment of Alternate CISO has been relaxed for reasons recorded thereof, Alternate CISO has to mandatorily acquire the minimum required cyber security skill sets within six months from the date of his appointment.
b) The Responsible Entity shall regularly update details of CISO and Alternate CISO, with the Sectoral CERT, as well as on ISAC-Power Portal.
c) Roles and Responsibility of CISOs shall be as laid by CERT-In and ring-fenced to ensure cyber security of the Cyber Assets of the Responsible Entity.

Article 3: Identification of Critical Information Infrastructure (CII).

a) The Responsible Entity shall submit to NCIIPC through Sectoral CERT, details of Cyber Assets which uses a routable protocol to communicate outside the Electronic Security Perimeter drawn by the Responsible Entity or a routable protocol within a control centre and dial-up accessible Cyber Assets, within 30 days from the date of their commissioning in the System.
b) The Responsible Entity shall submit details of Critical Business Processes and underlying information infrastructure along with mapped impact and Risk Profile to NCIIPC and shall get their CIIs identified in consultation with NCIIPC. The process of the notification/declaration by Appropriate Government shall follow thereafter.
c) The Responsible Entity shall review their declared/notified CIIs at least once a year to examine changes if any in the functional dependencies, protocols and technologies or upon any change in security architecture. The Responsible Entity shall review their declared/notified CIIs once in every 6 months, in case if NCIIPC has directed them to constitute an Information Security Steering Committee.
d) The Responsible Entity shall ensure that all cyber assets of their identified/notified CIIs are recorded in the asset register and considered for risk assessment as well as for finalization of controls in statement of applicability.

Article 4. Electronic Security Perimeter

a) The Responsible Entity shall identify and document the Electronic Security Perimeter(s) and all Access Points to the perimeter(s).

b) The Responsible Entity shall follow procedure of identifying "Electronic Security Perimeter" in case of distributed and/or hybrid information infrastructure, as per IEC 62443 / IS16335 (as amended from time to time).
c) The Responsible Entity shall ensure that every Critical System resides within an Electronic Security Perimeter.
d) The Responsible Entity shall perform a cyber-Vulnerability Assessment of each electronic Access Points to the Electronic Security Perimeter(s) at least once in every 6 (six) months and/or after any change in Security Architecture.
e) The Responsible Entity shall ensure that all critical, high and medium vulnerabilities identified as a result of cyber Vulnerability Assessment shall be closed and verified for the effective closure.

Article 5. Cyber Security Requirements

a) The Responsible Entity shall have an Information Security Division (ISD), headed by CISO.
b) The Responsible Entity shall ensure that the ISD must be functional on 24x7x365 basis and is manned by sufficient numbers of Engineers having valid certificate of successful completion of course on cyber security of Power Sector from the Training Institutes designated by CEA.
c) The Responsible Entity shall ensure that ISD
   1) has on-boarded Cyber Swachhta Kendra(CSK) of CERT-In, if they have public IPs.
   2) has timely acted upon the advisories, guidelines and directive of NCIIPC, CSK, CERT-In and Sectoral CERTs,
   3) has deployed an Intrusion Detection System and Intrusion Prevention System capable of identifying behavioural anomaly in both IT as well as OT Systems.
   4) shares reports on incident response and targeted malware samples with CERT-In,
   5) updates the firmware/software with the digitally signed OEM validated patches only.
   6) enables only those ports and services that are required for normal operations. In case of any emergency the procedure as laid in Access management be followed.
   7) maintains firewall logs for the last 6 months duration. Firewall logs shall be analysed and all critical and high severity comments shall be addressed for effective closure.
   8) retains document of FAT, SAT test results and report/ certificate of cyber tests carried out for compliance of Government Orders and Cyber Security Audit.*
   9) maintains all cyber logs and cyber forensic records of any incident for at least** 90 days.

      * FAT, SAT must include comprehensive cyber security tests of the component/equipment/system to be delivered/delivered at site.
      ** 90 days from date of the commissioning of the system/recovery from any incident, whichever is later.

d) The Responsible Entity shall routinely audit and test security properties of the Critical System and must act upon, in case if any new vulnerabilities is identified through testing or by the equipment manufacturer.

e) The Responsible Entity shall design a secure architecture for control system appropriate for their process control environment*.

f) All State Load Dispatch Centres(SLDCs) shall comply with the directions issued by the National Load Dispatch Centre(NLDC) as well as Regional Load Dispatch Centres(RLDCs) U/s 29 (1) of the Electricity Act, 2003 to ensure stability and cyber security of grid operation and achieve efficiency in the grid operation. In case of any non-compliance, the Head of SLDC shall be responsible and shall be liable for Penalty as per the provision of CERC/SERC.

*There are so many different types of systems in existence and so many possible solutions, it is important that the selection process ensures that the level of protection is commensurate with the business risk and the Responsible Entity shall not rely on one single security measure for its defence. *(Reference IEC/TR62351-10* Edition1.0 2012-10 *Power systems management and associated information exchange –Data and communications security – Part 10: Security architecture guidelines).*

Article 6 Cyber Risk Assessment and Mitigation Plan

a) The Responsible Entity shall document in their Cyber Security Policy a Cyber Risk Assessment and Mitigation Plans drawn upon the best practises being followed in the Power Sector, and the same shall be approved by Board of Directors.

b) The Cyber Risk Assessment and Mitigation Plans shall clearly define the matrix for assessing the cyber risk of both IT and OT environment and risk acceptance criteria.

c) The Cyber Risk Assessment Plan shall be capable to demonstrate that repeated cyber security risk assessment delivers consistent, valid and comparable results.

d) The review of cyber risk assessment shall be carried out at least once in a Quarter. The actionable of risk treatment and mitigation shall be tracked in this review for their effectiveness.

e) The CISO shall be responsible for implementation and regular review, on the basis of internal and external feedbacks, of the Cyber Risk Assessment and Mitigation Plans.

Article 7 Phasing out of Legacy System

a) As the life cycle of the Power System Equipment/System is longer than that of IT Systems deployed therein, the Responsible Entity shall ensure that all IT technologies in the Power System Equipment/System should have the ability to be upgraded.

b) The Responsible Entity shall ensure that the Information Security Division shall draw the list of all communicable equipments/systems nearing end life or are left without support from OEM. Thereafter CISO shall identify equipment/systems to be phased out from the list drawn, firm up their replacement plan and put up the replacement plan for approval before the Board of Directors.

c) The CISO shall ensure that till equipments/systems nearing end life or left without support from OEM are not replaced, their cyber security is hardened and ensured through additional controls provisioned in consultation with the OEM or alternate Supplier(s)*.

*e.g. Use of CDAC developed AppSamvid and whitelisting of applications installed may be explored across all legacy systems.

d) The Responsible Entity shall document in their Cyber Security Policy a Standard Operating Procedure for safe and secure disposal of outlived or legacy devices.

Article 8. Cyber Security Training.

a) The Responsible Entity shall establish, document, implement, and maintain an annual cyber security training program for personnel having authorized cyber or authorized physical access (unescorted or escorted) to their Critical Systems.
b) The Responsible Entity shall review annually their cyber security training program and shall update it whenever necessary. Annual Review shall record evaluation of the effectiveness of the trainings held.
c) The Responsible Entity shall ensure that Cyber Security training program designed for their IT as well as OT O&M Personnel must include following topics and as per their functional requirements and security concerns additional topics shall be added:
   1) User authentication and authorization.
   2) Cyber Security and Protection mechanisms of IT/OT/ICS Systems.
   3) Introduction to various standards i.e. ISO/IEC:15408, ISO/IEC:24748-1, ISO: 27001, ISO: 27002, ISO 27019, IS 16335, IEC/ISO:62443.
   4) Training on implementation of ISO/IEC 27001 and awareness on IEC 62443.
   5) Vulnerability Assessment in the Critical System.
   6) Monitoring and preserving of electronic logs of access of Critical Assets.
   7) Detecting cyber-attacks on SCADA and ICS systems
   8) The handling of Critical System during cyber crisis.
   9) Action plans and procedures to recover or re-establish normal functioning of Critical Assets and access thereto following a Cyber Security Incident.
   10) Hands on SCADA operation at any of the Regional Load Dispatch Centre.
   11) Handling of risks involved in the procurement of COTS Products.
d) All Personnel engaged in O&M of IT & OT Systems shall mandatorily undergo courses on cyber security of Power Sector from any of the training institute designated by CEA, immediately within 90 days from the notification of CEA Guidelines on Cyber Security in Power Sector.
e) The Responsible Entity shall ensure that none of their newly hired or the current Personnel have access to the Critical System, prior to the satisfactory completion of cyber security training programme from the Training Institutes designated in India, except in specified circumstances such as cyber crisis or an emergency.
f) NPTI in consultation with CEA shall identify and design domain specific courses on Cyber Security for different target groups. The "Governing Board for PSO Training and Certification" shall approve the content, duration etc of these courses and shall review it Annually. NPTI shall conduct these courses at all of their branches on regular basis and shall maintain the list of the Participants successfully completing the course.

Article 9 Cyber Supply Chain Risk Management

a) The Responsible Entity shall ensure that, as and when Ministry of Power, Government of India notifies the Model Contractual Clauses on cyber security, these clauses are included in their every Bid invited for procurement of any ICT based components/equipments/System to be used for Power System.
b) The Responsible Entity shall ensure that all the Communicable Intelligent Equipments and the Service Level Agreements (SLAs) for their Critical Systems shall be sourced from the list of the "Trusted Sources" as and when drawn by MoP/CEA.

c) The Responsible Entity shall ensure that, in case, for the any Communicable Intelligent Devices, if no Trusted Source has been identified, then the successful bidder in compliance with the provisions made in MoP order dated 2.7.2020 and any other relevant MoP order has got the product cyber tested for any kind of embedded malware/Trojan/cyber threat and for adherence to Indian Standards at the designated lab.

d) The Responsible Entity shall ensure that the essential cyber security tests are carried out successfully during FAT, SAT as detailed in **Annexure A.** The equipment/System besides for functionality shall also be tested in the factory for vulnerabilities, design flaws, parts being counterfeit or tainted, so as to minimize problems during on-site-testing and installation. Cyber Security Conformance Testing are to be carried out in the designated Lab as listed in **Annexure-I of MoP Order No. 12/13/2020-T&R dt. 8th June, 2021(Order at Annexure-B).**

e) The Responsible Entity shall ensure that the Equipment/System supplied by the successful bidder shall accompany with a certificate[$, #] obtained by OEM from a certification body accredited to assess devices and process for conformances to IEC 62443-4 standards during design and manufacture. The Responsible Entity shall accept the certificate submitted along with the supplied Equipment/System only if it's in line with the Testing Protocol as notified by Ministry of Power, Government of India, from time to time.

f) The Responsible Entity in compliance to the requirement of Article 9(e) shall also accept, till the setting up of an adequate certification facility in the India, a digitally signed self-declaration of conformance to the IEC 62443-4 standards during design and manufacture of the equipment/system, if submitted by the OEM.

g) The Responsible Entity shall dispose all unserviceable or obsolete Communicable Intelligent Devices as per the procedure laid in their Cyber Risk Assessment and Mitigation Plans which shall be in line with the prevailing best practices.

$ The National & International certification may be specified in the tender for critical systems/sub-systems being procured by the Responsible Entity.

Certification Schemes:
Embedded Device Security Assurance Certification is for an individual product,
System Security Assurance Certification is for a set of products in a system (possibly from different vendors)
Security Development Lifecycle Assurance Certification is for the development processes that a manufacturer uses for developing products.

Article 10 Cyber Security Incident Report and Response Plan

a) The CISO of the Responsible Entity shall report in the formats prescribed by CERT-In, all Cyber Security Incidents, classified as reportable events.

b) Root cause analysis for all reportable events shall be carried out and corrective action taken, so as to ensure that any re-occurrence of such event can be managed with ease.

c) The Responsible Entity shall mandatorily define in their Cyber Security Policy, criteria(s) identified on the basis of impact analysis, for declaring the occurrence of

Cyber Security Incident(s) as a Cyber Crisis in the System owned or controlled by them.

d) The Responsible Entity shall mandatorily designate an Officer along with his/her standby by name and designation and empower them to declare an occurrence of the incident(s) as "Cyber Crisis". The contact details of these Officers shall be updated in the C-CMP within 15 days of changes if any due to transfer or superannuation etc.
e) The CISO shall ensure that during any Cyber Security Incident, ISD monitors and minutely records every details of cyber security events and incidents in both IT as well as the OT System owned or controlled by the Responsible Entity.
f) The CISO shall ensure that each cyber incident is handled strictly as per Cyber Security Incident Response Plan detailed in the latest C-CMP approved by the Board of Directors.
g) The Responsible Entity shall ensure that the efficacy of the Cyber Security Incident Response Plan is tested annually through mock drill(s) carried out, if feasible, as simulation exercise(s) or as table top exercise(s) with wider participation of their employees, in consultation with CERT-In and sectoral CERT. In case if any shortcoming is observed in the Cyber Security Incident Response Plan suitable changes shall be made in it.
h) The Responsible Entity shall ensure that the CISO compiles details of incident detection, incident handling, learnings from each incident and damage claims made if any and shall report to CERT-In as well as upload information on ISAC-Power Portal.

Article 11 Cyber Crisis Management Plan(C-CMP)

a) The Responsible Entity shall prepare a Cyber Crisis Management Plan and submit to their sectoral-CERT for review with intimation to Ministry of Power/CISO-MoP. Responsible Entity shall update their C-CMP on the basis of comments made by sectoral-CERT and then submit for vetting to CERT-In. The C-CMP shall be updated once again to include the observations made by CERT-In before seeking approval of Board of Directors for implementation of C-CMP.
b) The Responsible Entity shall ensure that the C-CMP is reviewed at least annually. The CISO shall ensure that all changes are made in C-CMP only with the due approval of Board of Directors and the changes made in C-CMP have been communicated through a verifiable means to all the concerned Personnel of the Responsible Entity.
c) The CISOs shall be the custodian of all the cyber security related documents including Cyber Crisis Management Plan, Risk Treatment Plan, Statement of Applicability of controls, and compliance to regulator's requirement.
d) The CISO shall be accountable for ensuring enforcement of C-CMP by Information Security Division of the Responsible Entity, during a cyber-crisis, as and when declared by the designated Officer. (refer Article 10(d))

Article 12: Sabotage Reporting%

a) The Responsible Entity shall incorporate procedure for identifying and reporting of sabotage in their Cyber Security Policy within 30 days from issue of the Guidelines, or grant of licence under the appropriate legal provisions to the Responsible Entity.
b) The CISO shall be held liable for non-reporting of identified sabotage(s) as per procedure laid for identifying and reporting of sabotage in the Cyber Security Policy of the Responsible Entity.

c) The CISO shall prepare a detailed report on disturbances or unusual occurrences, identified, suspected or determined to be caused by sabotage in the Critical System of the Responsible Entity, and shall submit the report to the Sectoral CERT as well as to CERT-In within 24 hours of its occurrence.

d) The CISO shall submit to NCIIPC within 24 hours of occurrence the report on every sabotage classified as cyber incidents(s) on "Protected System".

e) The CISO upon occurrence on every sabotage shall take custody of all log records as well as digital forensic records of affected Cyber Assets, Intrusion Detection System, Intrusion Protection System, SIEM and shall preserve them for at least 90 days and shall make them available as and when called upon for investigation by the concerned Agencies.

%Disturbances or unusual occurrences, suspected or determined to be caused by sabotage.
Sabotage e.g. can be a forced intrusion in un-manned/manned facility and taking control of operation of Critical System through a communicating device.

Article 13 Security and Testing of Cyber Assets

a) The Responsible Entity shall ensure security of all in-service phase as well as standby Cyber Assets through regular firmware/Software updates and patching, Vulnerability management, Penetration testing (of combined installations), securing configuration, supplementing security controls. CISO shall maintain details of update version of each firmware and software and their certification if received from OEMs.

b) The Responsible Entity shall carry out regularly Vulnerability Assessment of all Cyber Assets owned or under their control. If a Cyber Asset is found vulnerable to any exploits or upon any patch updates or major configuration changes, then further Penetration Testing may be carried out offline or in a suitably configured laboratory test-bed to determine other vulnerabilities that may have not been identified so far.

c) The Responsible Entity shall specify security requirement and evaluation criteria during each phase of their procurement Process.

d) The Responsible Entity shall ensure that all Cyber Assets being procured shall conform to the type tests as mentioned in the specification for type testing listed in the bid document. Type test reports of tests conducted in NABL accredited Labs or internationally accredited labs (with in last 5 years from the date of bid opening) shall be mandated to be submitted along with bid. In case, the submitted Type Test reports are not as per specification, the re-tests shall be conducted without any cost implication to the Responsible Entity.

e) The Responsible Entity shall ensure that all Communicable devices are tested for communication protocol as per the ISO/IEC/IS standards listed in **MoP Order No. 12/13/2020-T&R dated 8th June, 2021(Annexure-B).**

f) The Responsible Entity shall ensure that all Critical Systems designed with Open Source Software are adequately cyber secured.

g) The Responsible Entity as a best practise upon any incidence of Cyber Security Breach shall carry out cyber security tests at any lab designated for cyber testing by Ministry of Power. These tests shall be similar to Pre Commissioning Security Test and those essential for carrying out Post Incident Forensics Analysis.

Article 14 Cyber Security Audit

a) The Responsible Entity shall implement Information Security Management System (ISMS) covering all its Critical Systems.
b) The Responsible Entity shall through a CERT-In Empanelled Cyber Security OT Auditor shall get their IT as well as OT System audited at least once in every 6 (six) months and shall close all critical and high vulnerabilities within a period of one month and medium as well as low non-conformity before the next audit. Effective closure of all non-conformities shall be verified during the next audit.
c) The Cyber Security Audit shall be as per ISO/IEC 27001 along with sector specific standard ISO/IEC 27019, IS 16335 and other guidelines issued by appropriate Authority if any. These mentioned standards shall be current with all amendments if any and in case if any standard is superseded, the new standard shall be applicable. CISO shall ensure immediate closure of non-conformance, based on the criticality and by means all non-conformances are to be closed before the next audit.
d) The Responsible Entity shall ensure that CISO has all the required systems and documents in place, as mandated by NSCS for base line cyber security audit.

Annexure – A

FAT & SAT

1. During FAT stage, the customer has to verify all types test reports / certificates including Communication protocol and security conformance tests of the devices offered for FAT.
2. FAT of SCADA involves testing as a whole system in the integrated scale down set up. For SCADA, Indian standard IS 15953: 2011 "SCADA System for Power System Applications" provides definition and guidelines for the specification, performance analysis and application of SCADA systems for use in electrical utilities (for transmission & Distribution) including guidance on Tests and inspections.
3. The SAT will be done at customer site as per the SAT document mutually agreed by buyer and supplier. For SAT also, guidance from IS 15953: 2011need to be applied.
4. IEC 61850-10-3 Communication Networks and Systems For Power Utility Automation-Functional testing of IEC 61850 systems (in draft stage - CDTR) covers testing of applications within substations covering

    a. A methodical approach to the verification and validation of a substation solution
    b. The use of IEC 61850 resources for testing in Edition 2.1
    c. Recommended testing practices for different use cases
    d. Definition of the process for testing of IEC 61850 based devices and systems using communications instead of hard wired system interfaces (ex. GOOSE and SV instead of hardwired interfaces)
    e. Use cases related to protection and control functions verification and testing.

    This standard may be used as a guidelines for FAT & SAT for Substation Automation System (SAS) based on IEC 61850.

Annexure - B

Annexure – 1

List of designated laboratories for cyber security conformance testing

Table -A. Field Equipment /Operational Technology (OT)

Sl. No.	Equipment	Communication Protocol Conformance Standards	Protocol Security Conformance Standards	Designated Laboratories
1	Remote Terminal Units (RTUs) & PLCs with IEC communications protocols	IEC 60870-5 -101 / IEC 60870-5 -104 (Test Details Annexure 2)	IEC 60870-5- 7 Security extension & IEC 62351 series (specifically IEC 62351-100 parts 1 & 3) (Test Details Annexure-2	Central Power Research Institute (CPRI), Prof Sir C V Raman Road, Sadashivanagar P O. Bengaluru – 560080, Karnataka
2	Intelligent Electronic Equipment / Numerical Protection Relays / Bay Control Units / Bay Protection Units, Gateways, Transformer Tap controller/ changer, etc. with IEC 61850 communication protocol	IEC 61850 – 5 to IEC 61850 – 10 (Test Details Annexure 2)		CPRI
3	Smart meters with IEC 62056 communication protocols	IEC 62056 series / DLMS & IS 15959 series and IS 16444 series (Test details Annexure 2)	IEC 62056 series / DLMS & IS 15959 series and IS 16444 series (Test Details Annexure 2)	1. CPRI 2. Electrical Research and Development Association (ERDA), ERDA Road, GIDC, Makarpura, Vadodara - 390 010 Gujarat 3. Yadav Measurements Pvt. Ltd. (YMPL) 373-375, RIICO Bhamashah Industrial Area Kaladwas 313003 Udaipur – Rajasthan

Information Technology (IT) Equipment (Main / Backup / Disaster recovery (DR) Control Centre / Substation control centre IT equipment)

All IT products procured /supplied shall have a valid Certificate of Common Criteria as per ISO/IEC 15408 issued by signatories of the Common Criteria Recognition Agreement (CCRA) (www.commoncriteriaportal.org).

Import/procurement/supplied from vendors sourcing from prior reference countries, the Certificate for Common Criteria shall be from Government Laboratories in India according to the IC3S scheme operated by Ministry of Electronics and Information Technology, which is a signatory to CCRA.

https://www.commoncriteria-india.gov.in/

Annexure - 2

Details of tests for various identified products

Remote Terminal Units (RTUs) (Sl. No. 1 of Table – A of Annexure – 1)

Test protocol:

Utilities / manufacturers will submit the sample along with all the required technical documentation for taking up testing to the designated laboratory.

Reference standards

1) IEC 60870-5-101 & IEC 60870-5-104 as applicable

2) IEC 60870-5-7 Telecontrol equipment and systems - Part 5-7: Transmission protocols - Security extensions to IEC 60870-5-101 and IEC 60870-5-104 protocols (applying IEC 62351)

3) IEC 62351-100-1 & IEC 62351-100-3 and other cross referenced standards.

Test cases

Extract from standard (IEC 62351-100-1)

The conformance test cases are divided into four clauses:

- Clause 5: Verification of configuration parameters. This clause contains the configuration parameters affecting the message contents and/or the protocol behaviour.
- Clause 6: Verification of communication. The goal of this clause is to verify that Device Under Test (DUT) is able to implement the security extension messages as described in IEC TS 60870-5-7.
- Clause 7: Verification of procedures. The goal of this clause is to verify that DUT is able to execute the security extension procedures as described in IEC TS 62351-5.
- Clause 8: Test result chart. This clause contains the results of the test cases listed in Clauses 6 and 7 for each supported value of the configuration parameters listed in Clause 5.

The test cases are organized in tables. They are numbered; their numbering syntax is: Subclause number (where the Table is located) + test case number.

In the column 'reference' each test case has a direct reference to IEC TS 62351-5 or IEC TS 60870-5-7 where the clause under test is defined.

Test cases are mandatory depending on the description in the column 'Required'. The following situations are possible:

M= Mandatory test case. The test is referencing a clause that is mandatory in IEC TS 62351-5 or IEC TS 60870-5-7.

Protocol Information Conformance Statement (PICS) x, x = Mandatory test case if the functionality is enabled in the PICS (by marking the applicable check box), with a reference to the section number of the PICS (x.x).

Conformance testing of security extension procedures

The security extension procedures can be summarized as follows:

- User management
- Update key maintenance
- Session key maintenance
- Challenge/Reply authentication
- Aggressive Mode authentication

Extract from standard (IEC 62351-100-3)

IEC 62351-3 defines the requirements related to the authentication/encryption protocol, procedures and methods to be implemented at TCP/IP (transport) level.

The conformance test cases are divided into three clauses:

- Clause 5: Verification of configuration parameters. This clause contains the parameters specified by the standards referencing IEC 62351-3 (see IEC 62351-3:2014/AMD1:2018, Clause 7) and affecting the protocol behaviour.
- Clause 6: Verification of IEC 62351-3 requirements. The goal of this clause is to verify that DUT is conformant to the requirements of the IEC 62351-3.
- Clause 7: Test result chart. This clause contains the results of the test cases listed in Clause 6 for each supported value of the configuration parameters listed in Clause 5.

The test cases are organized in tables. They are numbered, their numbering syntax is: Subclause number (where the table is located) + test case number.

In the column 'Reference' each test case has a direct reference to IEC 62351-3 where the clause under test is defined. PICS or Protocol Implementation eXtra Information for Testing (PIXIT) could be found in the "Reference" column for some test cases whenever the execution of the test case shall take into account specific parameter values declared in the PICS or PIXIT of the DUT.

Test cases are mandatory depending on the description in the column 'Required'. The following situations are possible:

M = Mandatory test case. The test is referencing to a clause that is mandatory in IEC 62351-3.

PICS

or

PIXIT = Mandatory test case if the functionality is enabled in the PICS or PIXIT by marking the applicable check box or declaring the applicable value.

Intelligent Electronic Devices (IEDs) (Sl. No. 2 of Table – A of Annexure – 1)

Utilities / manufacturers will submit the sample along with all the required technical documentation for taking up testing to the designated laboratory.

Reference standards

IEC 61850 series

Specifically IEC 61850-5, IEC 61850-6, IEC 61850-7, IEC 61850-8, IEC 61850-9 and IEC 61850-10

Test cases

Communication protocol conformance as per IEC 61850 -10. This part of standard defines methods and abstract test cases for conformance testing of client, server and sampled values devices used in power utility automation systems, the methods and abstract test cases for conformance testing of engineering tools used in power utility automation systems, and the metrics to be measured within devices according to the requirements defined in IEC 61850-5. Further this part of standard specifies standard techniques for testing of conformance of client, server and sampled value devices and engineering tools, as well as specific measurement techniques to be applied when declaring performance parameters. The use of these techniques will enhance the ability of the system integrator to integrate IEDs easily, operate IEDs correctly, and support the applications as intended.

Smart Meters (Sl. No. 3 of Table – A of Annexure – 1)

Utilities / manufacturers will submit the sample along with all the required technical documentation for taking up testing to the designated laboratory.

IEC 62056 series of standards (Electricity metering data exchange – The DLMS/COSEM suite) specifies details of communication protocol requirements, conformance testing and security requirements. The Part 5-3 (DLMS/COSEM application layer) specifies the DLMS/COSEM application layer in terms of structure, services and protocols for DLMS/COSEM clients and servers, and defines rules to specify the DLMS/COSEM communication profiles. It defines services for establishing and releasing application associations, and data communication services for accessing the methods and attributes of COSEM interface objects, defined in IEC 62056-6-2 using either logical name (LN) or short name (SN) referencing.

Clause 5 and sub clauses specifies security requirements. It cover security concepts, Identification and authentication, Cryptographic algorithms, Cryptographic keys – overview, Key used with symmetric key algorithms, Keys used with public key algorithms and Applying cryptographic protection.

Note: All above referred standards shall be latest with amendments if any at the time of submission of sample(s) for testing.

Annexure – 3

Testing Criteria

1) Supply from Trusted Sources

The sample size shall be as specified by CEA as per the approved criteria for Trusted Vendors

2) Supply from other than trusted vendors

The sample size shall be shall be 5% of the supply lot / ordered quantity (minimum one). The manufacturer shall submit request to the Nodal agency along with vendor's / manufacturer's certifications for supply chain management system practices and secure product development process implementations based on any one or more of standards ISO / IEC 27036, ISO / IEC 20243, IEC 62443 for verification.

After scrutiny of vendor's / manufacturer's certifications the supplier / utilities shall be asked to submit product to the designated laboratory for communication and cyber security conformance testing.

The supply lot shall stand rejected on failure to comply with the test requirements.

3) Supply from prior reference countries

The utility shall obtain prior permission from the Government of India for importing the product / system from prior reference countries.

The sample size shall be shall be 10 % of the supply lot / ordered quantity (minimum one). The manufacturer shall submit request to the Nodal agency along with vendor's / manufacturer's certifications for supply chain management system practices and secure product development process implementations based on any one or more of standards ISO / IEC 27036, ISO / IEC 20243, IEC 62443 for verification.

After scrutiny of vendor's / manufacturer's certifications the supplier / utilities shall be asked to submit product to the designated Government / Government controlled Autonomous laboratory for type tests (Annexure – 4) and communication & cyber security conformance testing.

The supply lot shall stand rejected on failure to comply with the test requirements.

Type Tests

Products imported from prior reference countries shall also undergo type testing as per following standards in addition to communication protocol and security conformance testing at the designated Government / Government controlled Autonomous laboratory:

Type test standards for RTUs

1. IEC 60870-1-2:1989 Telecontrol equipment and systems. Part 1: General considerations. Section Two: Guide for specifications.
2. IEC 60870-2-1:1995 Telecontrol equipment and systems - Part 2: Operating conditions - Section 1: Power supply and electromagnetic compatibility.
3. EC 60870-2-2:1996 Telecontrol equipment and systems - Part 2: Operating conditions -Section 2: Environmental conditions (climatic, mechanical and other non-electrical influences).
4. IEC 60870-3:1989 Telecontrol equipment and systems. Part 3: Interfaces (electrical characteristics)

Type test standard for IEDs / Numerical Protection Relays / Bay controls units

1. IEC 61850-3: 2013, Ed. 2 Communication networks and systems for power utility automation – Part 3: General requirements.

Type test standards for Smart meters

1. IS 16444: 2015 AC static direct connected watthour smart meter class 1 and 2 – Specification.
2. IS 16444 Part 2: 2017 AC static transformer operated watthour and var - Hour smart meters, class 0.2 S, 0.5 S and 1.0 S: Part 2 specification transformer operated smart meters.

Note:

1. All above referred standards shall be latest with amendments if any at the time of submission of sample(s) for testing.
2. Type tests generally covers functionality, environmental, mechanical, EMI/ EMC and electrical safety related tests.

Annexure-A3

Government of India
Ministry of Railways
(Railway Board)

RBA No. 25/ 2006

No.2002/AC-II/1/10 New Delhi, Dated 24/05/06

1.General Managers/FA&CAOs etc.(As per standard list I)
2.All attached offices/subordinate offices (As per standard list II)

Sub:- Revised Codal life of Assets

*****

The matter regarding reassessment of codal life of assets has been under Board's consideration for quite some time. To reassess the codal/ service life of assets, a multi-disciplinary Executive Director's Committee was constituted. The recommendations of the committee have since been accepted by Board. Accordingly Advance correction slip no.62 amending Para 219/F-I detailing normal life of various classes of railway assets is placed below for information and necessary action.

Kindly acknowledge receipt.

DA: As above (9 pages)

Shivaji Rakshit
(Shivaji Rakshit) 23/5/06
Executive Director (Accounts)
Railway Board.

Copy to:

1. Dy.C&GA of India (Railways), Room No.224, Rail Bhawan, New Delhi. (with 45 spare copies).
2. GM/const./NFR, CAO/CE (Const.) /All Indian Railways.
3. EDCE (Plg.), EDCE(B&S), EDCE(G), ED/Track(M), ED/Track(P), ED/Track(MC), ED(Project), Adv.EE(RS), EDEE(G), EDEE(Dev.), ED(RE), EDFX-I, EDFX-II, EDF/S, EDF/B, ED/C&IS, EDME (Cg), EDME(Ft.), EDME(Tr.), EDME(W), EDME(Dev.), ED/Sig., ED(TD)
4. AC I (Comp.), AC III (6 copies), AC-IV, Code Revision, Accounts Inspection, Accounts Appropriation, Finance (Budget).

Shivaji Rakshit
(Shivaji Rakshit) 23/5/06
Executive Director (Accounts)
Railway Board

ADVANCE CORRECTION SLIP No. 62

Indian Railway Finance Code Vol.-I (Reprint Edition 1998) Para 219 :-

(i) Substitute table below Para 219 showing normal life of the various classes of railway assets with the following:-

(i) CIVIL ENGINEERING ASSETS

S.No.	Class of assets	Average life in years			
		ROUTES			
		A & B	C(Sub)	D	E
1. RAIL & FASTENTING etc.					
1.	Rail & Fastenings				
(a).	Rails	20	15	30	*30
(b).	Wooden Sleepers	10	10	10	*10
(c.1)	Metal sleepers (Cast Iron & Steel)	20	20	20	*20
(c.2)	Fittings steel trough	10	10	10	*10
(d).	Concrete sleepers	35	35	40	*40
(e).	Elastic Fastenings				
(i)	Elastic Rail clips	5-8	5-8	8-10	*8-10
(ii).	Rubber Pads/ Liners	2-4	2-4	4	*4-6
(f).	Switches	4	2/3	5	*5
(g).	Crossings	5	4/5	8	*8
2 (A). MAJOR BRIDGES					
(a).	Bridges work- Steel work	60			
(b).	Bridge Masonry	100			
(c).	Structures Steel	60			
(d).	Structure- masonry and cement concrete	65			
(e).	RCC Bridge Works	60			
(f).	Pre-stressed concrete-Bridge work	40			
(B). MINOR BRIDGES					
(a).	Bridges work-Steel work	60			
(b).	Bridge Masonry	100			
(c).	Structures Steel	60			
(d).	Structure- masonry and cement concrete	65			
(e).	RCC Bridge Works	60			
(f).	Pre-stressed concrete-Bridge work	40			
3. FOOT OVER BRIDGES					
(a).	Bridges work-Steel work	60			
(b).	Bridge Masonry	100			
(c).	Structures Steel	60			
(d).	Structure- masonry and cement concrete,	65			
(e).	RCC Bridge Works	60			
(f).	Pre-stressed concrete-Bridge work	40			
4.TRACK MACHINE (All Categories)		15			

*** The service life as indicated in the table is general life/service life for track components. However renewal/replacement will be subject to various criteria laid down in IRPWM about its condition.**

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(ii) COMPUTERS AND OTHER IT SYSTEMS

S.No.	Class of assets	Average life in years
1	Passive Networking equipt (viz.Network Cabling)	10
2	Larger Multiuser system (s) & Active Networking Equipt (viz. MIS systems including external storage systems and their inter connects)	6
3	PRS systems	4
4	Small Multi-user system(s) and Power Supply equipments (viz. Individual office LANs, UPS)	4
5	PCs	3
6	Secondary Systems (viz. Printers, Portable computers, Dumb Terminals)	3

(iii) ELECTRICAL ASSETS

S.No.	Class of assets	Average life in years
1.	Electric Locomotives	35
2.	EMU/Metro Motor Coaches	25
3.	EMU/Metro Trailor Coaches	25
4.	Over Head Power Lines	40
5.	Over Head Traction Line excluding contact wire	60
6.	Electric under ground Cables	30
7 (a)	Electric contact wire (Alm.)	25
(b)	Electric contact wire (Copper)	40
8.	Electric Power plant excluded oil engine driven	25
9.	Electric Plant above 25 HP	25
10.	Electric power plant oil engine driven (diesel)	15
11.	Overhead traction lines contact wire	40
12.	Electric Machinery others	30
13.	Electric Sub Station Building	50
14.	Water Cooler, Refrigeration, Air Conditioner, hospital and domestic appliance	5
15.	Internal wiring of building	10
16.	Switch Gear	25
17.	Instruments	25

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S.No.	Class of assets	Average life in years
18.	Electric Pumps	20
19.	Electric Lifts & Hoist	20
20.	Ceiling Fans	20
21.	Electric Battery charging set	15
22.	Flood Light Projection	10
23.	Battery lead Acid	4
24.	Coach wiring	12
25.	Carriage Fans	10
26.	Air conditioner Central unit –above 3 tons	10

B) Equipments required for replacement through DRF/ Sinking Fund.

S.No	Class of assets	Average life in years
27	**AC EQUIPMENT**	
(i)	25 KV Inverter	15
(ii)	AC Control Panel (As per F-1 codal life is 12 yrs.	15
(iii)	Inverter Panel	15
28	**TL Power Equipment**	
(i)	4.5/18/22.75/25 KW Alternator (As per F-1 codal life of Dynamo is 20 years)	12
(ii)	800 A.H.L.A Battery	4
(iii)	1100 AH VRLA (SMF) Battery	4
(iv)	Diesel Engine for Powers Car	15
(v)	Alternator for Power Car	15
29	**Electric Locomotive Equipments**	
(i)	All Electric rotating machines up to 25 HP used on Electric Locomotives, EMU's Coaches and for stationary items	12
(ii)	All Electric rotating machines above 25 HP and upto 750 HP used on Electric Locomotives, EMU's Coaches and for stationary items	12
(iii)	Traction Motor	18
(iv)	Traction Converters	18
(v)	Auxiliary Converters	18
(vi)	Control Electronics	18
(vii)	Tap-Changer	35
(viii)	Rectifier Block	18
(ix)	Traction Gears	12
(x)	Motor Suspension	12
(xi)	Bogies with Wheel	18
(xii)	Armature for Traction Motors	15

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S.No	Class of assets	Average life in years
(xiii)	Stator for Traction Motor	18
(xiv)	Commutator for Traction Motor	15
(xv)	Locomotive re-cabling	18
30.	Microprocessor based control and fault diagnostic system	12
31.	Speedometer cum recorder and monitoring system	10
32.	BA Panel	18
33.	VCB	18
34.	DBR(roof mounted)	9
35.	DBR(vertical mounted)	9
36.	Pantograph	12
37.	**TRD Equipments**	
(i)	Current/Potential/transformer	30
(ii)	Earthing system in sub-station etc.	15
(iii)	Lighting arrestor (Gapless type)	15
(iv)	Lighting arrestor (Convertor type)	15
(v)	Buster & Terminal connection	30
(vi)	Battery charger	15
(vii)	Relay (Electromechanical)	15
(viii)	Relay (Electronic)	15
(ix)	Instruments (Electrical)	30
(x)	Instruments (Electronic)	30
(xi)	Relay testing kit & other testing equipment	15

C). Equipments required for replacement through Revenue

S.No.	Class of assets	Average life in years
1	**Electric Loco Equipment**	
(i)	Armature for Traction Motor	15
(ii)	Stator for Traction Motor	18
(iii)	Commutator for Traction Motor	15
(iv)	Auxiliary Motor	18
(v)	Arno Converter	18
(vi)	Blower Impeller/Casing	10
(vii)	Locomotive re-cabling	18
(viii)	Power Cables	18
(ix)	Control Cables	18
(x)	Compressor with exhausters complete recondition /replacement	10/15
2	**AC Equipment**	
(i)	Compressor ACCEL/ CARRIER	10
(ii)	Sealed Compressor KCL make	5
(iii)	Sealed Compressor Maneurope make	8

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S.No.	Class of assets	Average life in years
(iv)	Compressor Motor DC	10
(v)	Compressor Motor AC	15
(vi)	Condenser Fan Motor (DC)	8
(vii)	Condenser Fan Motor (AC)	10
(viii)	Condenser Fan Motor (RMPU)	10
(ix)	Evaporater Fan Motor (AC)	10
(x)	Evaporater Fan Motor (DC)	10
(xi)	Evaporater Fan Motor (RMPU)	12
(xii)	Condenser Unit	8
(xiii)	Condenser Unit (RMPU)	10
(xiv)	Evaporater unit	10
(xv)	Evaporater unit (RMPU)	10
(xvi)	Mercury in glass thermostat	5
3	**TL/Power Equipment**	
(i)	4.5/18/22.75/25 KW alternator regulator	12
(ii)	Emergency 90 AH LIA. Battery	3
(iii)	120 AH VRLA (SMF) Batttery	4
(iv)	290 AH starting L.A. Batteries for Power Car	3
(v)	Power Car power panel	15
(vi)	Power panel (AC coaches)	15
(vii)	Pre Cooling cum battery charging transformer rectifier unit	12
(viii)	50 KVA 750/415 V transformer unit	15
(ix)	3 KVA 415/190 V transformer	15
(x)	Water Raising Apparatus (WRA)	5
(xi)	Water Boiler for Pantry	5
(xii)	Hot Case for Pantry	5
(xiii)	Bottle Cooler cum deep freezer	5
(xiv)	Ventilation Blower Motor for Power Car	12
(xv)	Radiator for Power car	10
(xvi)	Radiator Motor for Power Car	15

(IV) MECHANICAL ASSETS

S.No.	Class of assets	Average life in years
	Machinery & Plant	
1	Machine Tools like Lathes, Planners, Drilling, Boring and Milling machines etc.	15
2	High Precision and special purpose machines like wheel Lathes etc.	15

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28/5/96

S.No.	Class of assets	Average life in years
3	Tool Room and Testing Laboratory equipment	15
4	Foundry and Forge Equipment	15
5	Heat Treatment Equipment	15
6	Cranes-EOT	25
7	Power Generation Machinery & Switches	15
8	General purpose light machinery e.g. band saws, floor grinder etc.	10
9	Air Compressors	15
10	Other miscellaneous machines e.g. light cleaning machines, test equipment in diesel sheds, workshops, depots & sick lines	15
11	(i). Construction Machinery	15
	(ii). Track Maintenance equipment	20
12	Station machinery e.g. weighing machines etc.	15
13	Miscellaneous machinery and equipment for hospital, offices etc.	10
14	Mechanical Weigh Bridges	15
15	Electronic in motion Weigh Bridges	08
16	Diesel Pumps	10
17	Welding equipment including diesel welding sets	10
18	Diesel refrigeration equipment	15
19	Material handling equipment like FLT, Lister trucks etc.	10
20	Traversers	25
21	Fuel Station Dispensation Equipment	10
22	Bulldozers and other earth moving equipment	15
23	Motor Boats	10
24	Hydraulic re-railing equipment	15
	ROAD VEHICLES	
25	Staff Cars including Jeeps	07
26	Light Motor Vehicles	10
27	Heavy Motor Vehicles	10
28	Tractors	10
	ROLLING STOCK	
29	Diesel Electric/ Hydraulic Locomotives	36
30	Diesel Engine	18
31	Shunting Locomotives	36
32	Steam Locomotives	40
33	Boiler and Tender	20
34	Steam Cranes	30
35	Diesel Hydraulic Cranes	25
36	Steel Body Coaches including DMUs/EMUs, Restaurant Cars etc.	25

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S.No.	Class of assets	Average life in years
37	Full Stainless Steel Body Coaches including DMUs/EMUs, Restaurant Cars etc.	30
38	Light utilisation categories of coaches (steel body) like inspection carriages etc.	40
39	IRS Coaches	30
40	Open Bogie wagons with air brakes and Casnub bogies	30
41	Bogie tank wagons with air brakes and Casnub bogies	40
42	All other types of Bogie wagons with air brakes and Casnub bogies	35
43	Open wagons with vacuum brakes and UIC bogies	25
44	Other wagons with vacuum brakes and UIC bogies	30
45	4- Wheeler wagons (open and covered)	30
46	4- Wheeler tank wagons (with plain bearings)	35
47	4-Wheeler tank wagons (with roller bearings)	35

(V) SIGNAL & TELECOMMUNICATION ASSETS

(A) SIGNALLING SYSTEM

S.No.	Class of assets	Routes	Average life in years
1.	Electrical/ Mechanical Signalling System	• Route-' A' • Route-'C'/Sub Urban section • Big Yards on all Routes	25 Yrs.
		• Routes- 'B' • Route 'D' • Route 'D'-special'	25 to 28 Yrs depending upon location & condition
		• Routes-'E' • Route 'E- Special'	30 Yrs
2.	Electronic Signalling system like SSI, Axle Counter, AWS, AFTC, IPS etc.		15 years or based on obsolescence.

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23/5/06

(B) SIGNALLING EQUIPMENT

S No	Class of assets	Life in terms of operations	Average life in years				
			Routes				
			A	B	C/ Suburban	D & D-Spl	E & E-Spl
1	Cranks and Compensators	50,000	2	2	1	4	4
2	Lock Bar Clips	1,00,000	3	3	3	5	7
3	Facing Point Lock with bolt detection	3,00,000	8	8	8	15	15
4	Mechanical Detectors	5,00,000	-	15	—	20	25
5	Circuit breakers	5,00,000	15	15	15	25	30
	Lever locks	-	7	7	7	12	15
6	EK Transmitter	-	10	10	10	15	15
7	SM's Slide Frame	-	30	30	30	30	30
8	Electric Point Detector & Reversors	-	15	15	15	20	20
9	Signal Machines	1,50,000	-	10	-	20	20
10	Signal Wire Transmission	-	3	3	3	3	3
11	Point Machine	3,00,000	12	12	7	15	15
12	Plug-in and Shelf type relays	10,00,000	25	28	25	28	30
13	Track Feed battery chargers	-	10	10	10	10	10

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EDN 23/5/96

S No	Class of assets	Life in terms of operations	Average life in years				
			Routes				
			A	B	C/ Suburban	D & D-Spl	E & E-Spl
14	Signal Transformers, Transformers	-	12	12	12	12	12
	Battery Chargers, DG Sets, Inverters,	-	10	10	10	10	10
15	Batteries	-	4	4	4	4	4
16	Block Instruments	-	25	25	25	25	25
17	Cable	-	20	20	20	20	20
18	Block Instrument Electro Mechanical	-	20	20	20	20	20

(C) TELECOMMUNICATION EQUIPMENT

S..No.	Class of assets	Average life in years
1	Microwave Equipment	12-15 Years
2	Exchange & accessories including Telephone equipment	12-15 Years
3	Under Ground Cables	Quad)-20 Years PUF)
		OFC -20 Years
4	Overhead alignment	25 Years
5	All other electronic/ wireless items including OFC equipment	12-15 Years
6	Cell Phones	5-8 Years
7	FAX	10 Years
8	Walkie-Talkie Sets/VHF	5-8 Years
9	Datacomm. Equipment, Routers, Modems, PCs etc.	5-8 Years

*****

Shivaji Pabalkit
JEDN 23/5/06

केन्द्रीय विद्युत विनियामक आयोग
CENTRAL ELECTRICITY REGULATORY COMMISSION

नई दिल्ली
NEW DELHI

. /Petition No.: 319/RC/2018

/Coram:

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

आद 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**

Annexure-A5

रजिस्ट्री स. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

भारत का राजपत्र
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असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (ii)
PART II—Section 3—Sub-section (ii)

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पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय

अधिसूचना

नई दिल्ली, 31 दिसम्बर, 2021

का.आ. 5481(अ).—केन्द्रीय सरकार ने भारत सरकार के तत्कालीन पर्यावरण और वन मंत्रालय की अधिसूचना सं. का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से तीन सौ किलोमीटर के विनिर्दिष्ट व्यास के भीतर ईंटों के विनिर्माण के लिए उपजाऊ मिट्टी के उत्खनन को प्रतिबंधित करने के लिए और भवन निर्माण सामग्री के विनिर्माण में और संनिर्माण क्रियाकलाप में फ्लाई-राख के उपयोग को बढ़ावा देने के लिए निदेश जारी किए हैं;

और, प्रदूषणकर्ता भुगतान सिद्धांत (पीपीपी) के आधार पर, ऐसा करके कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों द्वारा फ्लाई-राख का 100 प्रतिशत उपयोग सुनिश्चित करते हुए और फ्लाई-राख प्रबंधन प्रणाली की संधारणीयता के लिए पूर्वोक्त अधिसूचना को और अधिक प्रभावकारी ढंग से कार्यान्वित करने हेतु, केंद्रीय सरकार ने मौजूदा अधिसूचना की समीक्षा की;

और प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर पर्यावरणीय प्रतिकर निर्धारित किए जाने की आवश्यकता है;

और, विनिर्माण को बढ़ावा देकर तथा निर्माण कार्य के क्षेत्र में राख आधारित उत्पादों तथा भवन निर्माण सामग्रियों के प्रयोग को अनिवार्य करके उपजाऊ मिट्टी को संरक्षित करने की आवश्यकता है;

और, सड़क बनाने, सड़क एवं फ्लाई ओवर के रेलिंग बनाने, तटरेखा की सुरक्षा का उपाय करने, अनुमोदित परियोजनाओं के निचले क्षेत्रों को भरने, खनित स्थलों को फिर से भरने में मिट्टी की सामग्रियों से भरने के विकल्प के रूप में राख उपयोग को बढ़ावा देकर उपजाऊ मिट्टी और प्राकृतिक संसाधनों को संरक्षित करने की आवश्यकता है;

और, पर्यावरण को सुरक्षित करना तथा कोयला अथवा लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई राख के निक्षेपण तथा निपटान की रोकथाम करना आवश्यक है;

और, उक्त अधिसूचना में जो 'राख' शब्द का प्रयोग किया गया है उसमें कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित फ्लाई-राख और बॉटम-राख दोनों शामिल हैं;

और, केंद्रीय सरकार प्रदूषणकर्ता भुगतान सिद्धांत के आधार पर, पर्यावरणीय प्रतिकर की प्रणाली सहित राख के उपयोग के लिए एक व्यापक ढांचा लाना चाहती है;

अत: पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारत सरकार के पर्यावरण एवं वन मंत्रालय की अधिसूचना जो का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 द्वारा भारत के राजपत्र, असाधारण भाग ।।, खंड 3, उप खंड (i) में प्रकाशित का अधिक्रमण करते हुए, कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा राख के उपयोग के संबंध में प्रारूप अधिसूचना जो सा.का.नि. 285 (अ) तारीख 22 अप्रैल, 2021 द्वारा भारत के राजपत्र, असाधारण, भाग-2, धारा 3, उप धारा (i) में प्रकाशित की गई थी जिसमें उन सभी व्यक्तियों से जिनका इससे प्रभावित होना सामान्य है उस तारीख से, जिसको उक्त प्रारूप उपबंधों की शासकीय राजपत्र में अंतर्विष्ट प्रतियां जनता को उपलब्ध करा दी गई थी, साठ दिनों के अवसान से पूर्व आक्षेप और सुझाव आमंत्रित किए गए थे।

और उक्त प्रारूप अधिसूचना के संबंध में उससे संभावित तौर पर प्रभावित होने वाले सभी व्यक्तियों से प्राप्त आक्षेपों और सुझावों पर केंद्रीय सरकार द्वारा सम्यक रूप से विचार कर लिया गया है;

अत: पर्यावरण (संरक्षण) नियम, 1986 के नियम (5) के उप-नियम (3) के खंड (घ) के साथ पठित पर्यावरण (संरक्षण) अधिनियम, 1986 (1986 का 29) की धारा 3 की उप-धारा (1) और उप-धारा (2) के खंड (v) द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए और अधिसूचना का.आ. 763 (अ) तारीख 14 सितम्बर, 1999 का उन बातों के सिवाय अधिकांत करते हुए जिन्हें ऐसे अधिक्रमण से पूर्व किया गया है या करने का लोप किया गया है, केन्द्रीय सरकार कोयलों या लिग्नाईट आधारित ताप विद्युत संयंत्रों से राख के उपयोग के संबंध में निम्नलिखित अधिसूचना जारी करती है, जो इस अधिसूचना के प्रकाशन की तिथि से प्रवृत्त होगी, अर्थात्

क. फ्लाई-राख और बॉटम-राख का निपटान करने हेतु ताप विद्युत संयंत्रों (टीपीपी) के उत्तरदायित्व.-

(1) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र (जिनमें कैप्टिव और/या सह-उत्पादन केंद्र शामिल हैं या दोनों) की यह प्राथमिक जिम्मेदारी होगी कि वह अपने द्वारा सृजित राख (फ्लाई-राख और बॉटम-राख) का उप पैरा (2) में दिए गए पारि-अनुकूल तरीके से 100 प्रतिशत उपयोग सुनिश्चित करे;

(2) कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्रों से सृजित राख का उपयोग केवल निम्नलिखित पारि-अनुकूल प्रयोजनों के लिए किया जाएगा, अर्थात्:-

(i) फ्लाई राख पर आधारित उत्पाद अर्थात्: ईंट ब्लॉक टाइल, फाइबर सीमेंट शीट, पाइप, बोर्ड, पैनल का विनिर्माण;

(ii) सीमेंट विनिर्माण, रेडी-मिक्स कंक्रीट;

(iii) सड़क निर्माण और फ्लाई-ओवर के रेलिंग का निर्माण, राख और जिओ-पॉलीमर आधारित निर्माण सामग्री;

(iv) बांध का निर्माण;

(v) निचले क्षेत्र को भरना;

(vi) खनन कार्य से रिक्त हुए स्थान को भरना;

(vii) सिंटर्ड या शीत–बद्ध राख संचय का विनिर्माण;

(viii) मृदा परीक्षण के आधार पर नियंत्रित तरीके से कृषि;

(ix) तटीय जिलों में तटरेखा संरक्षण संरचनाओं का निर्माण;

(x) अन्य देशों को राख का निर्यात;

(xi) समय-समय पर यथाधिसूचित किसी अन्य पारि-अनुकूल प्रयोजन के लिए।

(3) अध्यक्ष, केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति गठित की जाएगी जिसमें पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी), विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय, कृषि अनुसंधान एवं शिक्षा विभाग, सड़क कांग्रेस संस्थान तथा राष्ट्रीय सीमेंट एवं भवन सामग्री परिषद के प्रतिनिधियों को सदस्यों के रूप में शामिल किया जाएगा, जिसका प्रयोजन राख के उपयोग के पारि-अनुकूल तौर-तरीकों की जांच करना, उनकी समीक्षा एवं अनुशंसा करना तथा प्रौद्योगिकीय विकासों तथा पणधारी से प्राप्त अनुरोधों के आधार पर उप-पैरा (2) में यथोल्लिखित ऐसे तौर-तरीकों की सूची में समिति द्वारा सुझाए गए तौर-तरीकों को शामिल करना या किसी तौर-तरीके को सूची से हटाना या उसमें संशोधन करना है। जब भी इस प्रयोजन के लिए अपेक्षित हो, यह समिति राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति, ताप विद्युत संयंत्र और खानों के प्रचालकों को आमंत्रित कर सकती है। इस समिति सिफारिश के आधार पर, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय ऐसे पारि-अनुकूल प्रयोजन प्रकाशित करेगा।

(4) प्रत्येक कोयला या लिग्नाइट आधारित ताप विद्युत संयंत्र उस वर्ष के दौरान सृजित राख (फ्लाई-राख और बॉटम-राख) का 100 प्रतिशत उपयोग करने हेतु उत्तरदायी होगा; तथापि, किसी भी स्थिति में, किसी वर्ष में राख का उपयोग 80 प्रतिशत से नीचे नहीं होगा और साथ ही, उस ताप विद्युत संयंत्र को तीन वर्ष की अवधि में 100 प्रतिशत औसत राख के उपयोग का लक्ष्य प्राप्त करना होगा :

परंतु, यह और कि पहली बार के लिए लागू तीन वर्ष के चक्र को ऐसे ताप विद्युत संयंत्रों, जहां राख का उपयोग 60-80 प्रतिशत के बीच होता है, एक वर्ष के लिए और ऐसे संयंत्रों, जहां राख का उपयोग 60 प्रतिशत से कम है, दो वर्ष के लिए बढ़ाया जा सकता है, और राख के उपयोग की प्रतिशतता की गणना के प्रयोजन के लिए वर्ष 2021-2022 में उपयोग की प्रतिशत प्रमात्रा को नीचे दी गई तालिका के अनुसार ध्यान में रखा जाएगा:

तापीय विद्युत संयंत्रों के उपयोग की प्रतिशतता	100 प्रतिशत उपयोगिता प्राप्त करने के लिए प्रथम अनुपालन चक्र	100 प्रतिशत उपयोगिता प्राप्त करने के लिए द्वितीय अनुपालन चक्र
>80 प्रतिशत	3 वर्ष	3 वर्ष
60-80 प्रतिशत	4 वर्ष	3 वर्ष
<60 प्रतिशत	5 वर्ष	3 वर्ष

परन्तु, ताप विद्युत संयंत्रों के लिए 80 प्रतिशत न्यूनतम उपयोग प्रतिशतता, क्रमश: 60-80 प्रतिशत और <60 प्रतिशत की उपयोगिता की श्रेणी के तहत आने वाले ताप विद्युत संयंत्रों के लिए प्रथम अनुपालन चक्र के पहले वर्ष और पहले दो वर्षों पर लागू नहीं होगी।

परन्तु, अनुपालन चक्र के अंतिम वर्ष में सृजित 20 प्रतिशत राख को अगले चक्र में भी ले जाया जाएगा जिसका उपयोग उस अनुपालन चक्र के दौरान सृजित राख के साथ अगले तीन वर्षों में किया जाएगा।

(5) अप्रयुक्त संचित राख अर्थात् लीगेसी राख, जिसका इस अधिसूचना के प्रकाशन से पहले भंडारण किया गया है, को ताप विद्युत संयंत्र (टीपीपी) द्वारा इस रीति से क्रमिक रूप से उपयोग में लाया जाएगा, कि लीगेसी राख को इस अधिसूचना के प्रकाशन की तिथि से दस वर्षों के भीतर पूरी तरह उपयोग कर लिया जाएगा और यह उस विशिष्ट वर्ष के चालू संचालनों के माध्यम से राख उत्सर्जन के लिए निर्धारित उपयोग लक्ष्यों से अनिरिक्त होगा।

परन्तु, निम्नलिखित प्रतिशतताओं में यथा उल्लिखित लीगेसी राख की न्यूनतम मात्रा का उपयोग तात्स्थानी वर्ष के दौरान कर लिया जाएगा और लीगेसी राख की न्यूनतम मात्रा की ताप विद्युत संयंत्र की संस्थापित क्षमता के अनुसार वार्षिक राख उत्सर्जन के आधार पर की जानी है।

प्रकाशन की तिथि से वर्ष	पहला	दूसरा	तीसरा-दसवां
लीगेसी राख का उपयोग (वार्षिक राख की प्रतिशतता)	कम से कम 20 प्रनिशत	कम से कम 35 प्रतिशत	कम से कम 50 प्रनिशत

परन्तु, यह और कि लीगेसी राख का उपयोग वहां अपेक्षित नहीं है, जहां राख के तालाव या डाइक स्थिर हो गए हैं और हरित पट्टी के निर्माण या पौध रोपण से पुनरूद्धार किया गया है और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड इस संबंध में प्रमाणित करेगा। किसी राख तालाब या डाइक के स्थिरीकरण और भूमि-उद्धार का कार्य, जिसमें केन्द्रीय प्रदूषण नियंत्रण बोर्ड या राज्य प्रदूषण नियंत्रण बोर्ड द्वारा प्रमाणन शामिल है, इस अधिसूचना के प्रकाशन की तारीख से एक वर्ष के भीनर किया जाएगा। अन्य सभी राख के कुंड या डाइक में शेष बचे राख का उपयोग ऊपर उल्लिखित समय-सीमाओं के अनुसार क्रमिक रूप से किया जाएगा।

टिप्पण: राख के उपयोग के लक्ष्यों को हासिल करने के लिए उप पैरा (4) और (5) के अधीन दायित्व 01 अप्रैल, 2022 की तारीख से लागू होंगे।

(6) किसी भी नए तापीय विद्युत संयंत्र (टीपीपी) में 0.1 हेक्टेयर प्रति मेगावाट (एमडब्ल्यू) क्षेत्रफल के साथ आपातकालीन या अस्थायी राख कुंड की अनुमति दी जा सकती है। राख के तालाब या डाइकों का तकनीकी विर्निदेश, केन्द्रीय विद्युत प्राधिकरण (सीईए) के परामर्श से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा बनाए गए दिशानिर्देशों के अनुसार होगा और ये दिशानिर्देश राख के कुंड या डाइक के संबंध में इसकी सुरक्षा, पर्यावरणीय प्रदूषण, उपलब्ध प्रमात्रा, निपटान का तरीका, निपटान में जल की खपत या संरक्षण, राख जल पुनर्चक्रण और ग्रीन बेल्ट आदि के वार्षिक प्रमाणन के लिए कार्यविधि भी निर्धारित करेंगे और इस अधिसूचना के प्रकाशन की तारीख से तीन महीनों के भीतर प्रस्तुत किए जाएंगे।

(7) प्रत्येक कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्र यह सुनिश्चित करेगा कि राख की लदाई, उतराई, ढुलाई, भंडारण और निपटान पर्यावरणीय दृष्टि से अनुकूल रीति से किया गया है और वायु और जल प्रदूषण की रोकथाम के लिए सभी ऐहितयात किए गए हैं और इस संबंध में स्थिति की सूचना इस अधिसूचना में संलग्न अनुबंध में संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को दी जाएगी।

(8) प्रत्येक कोयला या लिग्नाइट आधारित तापीय विद्युत संयंत्र, संस्थापित क्षमता पर आधारित राख के कम से कम 16 घंटों के भंडारण के लिए समर्पित शुष्क फ्लाई राख साइलोस प्रतिष्ठापित करेगा, जिनके पास पृथक पहुंच मार्ग होंगे, जिससे कि राख पहुंचाने के कार्य को सुगम बनाया जा सके। इसकी सूचना संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को उपाबंध में दी जाएगी और केन्द्रीय प्रदूषण नियंत्रण

बोर्ड (सीपीसीबी) या राज्य केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति द्वारा समय-समय पर निरीक्षण किया जाएगा।

(9) प्रत्येक कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्र (जिसके अंतर्गत कैप्टिव या सह उत्पादन केन्द्र भी है या दोनों), वास्तविक उपयोगकर्ता (उपयोगकर्ताओं) के हित के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड के वेब पोर्टल या मोबाईल फोन एप्प का लिंक उपलब्ध कराकर ताप विद्युत संयंत्र के पास राख की उपलब्धता के वास्तविक आंकड़े प्रदान करेगा।

(10) राख के 100 प्रतिशत उपयोग का वैधानिक दायित्व, जहां भी लागू हो, विधि में बदलाव के रूप में माना जाएगा।

ख. राख के उपयोग के प्रयोजनार्थ, उत्तरवर्ती उप पैराग्राफ लागू होंगे .-

(1) ऐसे सभी अभिकरण (सरकारी, अर्द्धसरकारी और निजी), जो सड़क बिछाने, सड़क और फ्लाई ओवर के किनारों, तटीय जिलों में तटरेखा की सुरक्षा संरचनाओं और लिग्नाईट या कोयला आधारित ताप विद्युत संयंत्र से 300 किमी के भीतर बांधों जैसे निर्माण संबंधी कार्यकलापों में लगे हुए हैं, इन कार्यकलापों में अनिवार्य रूप से राख का उपयोग करेंगे :

परंतु इसको परियोजना स्थल पर निशुल्क पहुंचाया जाए और परिवहन लागत, ऐसे कोयला या लिग्नाईट आधारित ताप विद्युत संयंत्रों द्वारा वहन की जाए।

परंतु यह और कि ताप विद्युत संयंत्र पारस्परिक सहमत हुई शर्तों के अनुसार राख की लागत और परिवहन के लिए शुल्क ले सकता है उस मामले में जहां ताप विद्युत संयंत्र अन्य माध्यम से राख का निपटान करने में समर्थ है और ये अभिकरण इसके लिए प्रर्थाना कर सकते हैं और बिना लागत और बिना परिवहन शुल्क के राख उपलब्ध कराने के प्रावधान तभी लागू होंगे यदि उसके लिए ताप विद्युत संयंत्र उस निर्माण अभिकरण को नोटिस जारी करना है।

(2) उक्त कार्यकलापों में राख का उपयोग भारतीय मानक ब्यूरो, भारनीय रोड कांग्रेस, केन्द्रीय भवन अनुसंधान संस्थान, रूड़की, केन्द्रीय सड़क अनुसंधान संस्थान, दिल्ली, केन्द्रीय लोक निर्माण विभाग, राज्य लोक निर्माण विभागों और अन्य केन्द्रीय और राज्य सरकार के अभिकरणों द्वारा निर्धारित किए गए विनिर्देशों और दिशानिर्देशों के अनुसार किया जाएगा।

(3) तापीय विद्युत संयंत्र की 300 किलोमीटर की परिधि के भीतर अवस्थित सभी खानों के लिए विस्तारित उत्पादक उत्तरदायित्व (ईपीआर) के तहत खुली आवर्त खानों में राख का पृष्ठ भंडारण करना या अधिक भार के ढेरों के साथ राख का मिश्रण करना बाध्यकारी होगा। सभी खान के स्वामी या प्रचालक (चाहे सरकारी, सार्वजनिक और निजी क्षेत्र के हो) कोयला या लिग्नाईट आधारित तापीय विद्युत संयंत्रों से तीन सौ किलोमीटर (सड़क द्वारा) के भीतर, महानिदेशक, खान सुरक्षा (डीजीएमएस) के दिशानिर्देशों के अनुसार ओवर बर्डन के बाह्य निक्षेप खान की बैकफिलिंग अथवा स्टोविंग (प्रचालित या छोड़ी गई खानों, जैसा भी मामला हो) के लिए उपयोग की गई सामग्रियों के भार-दर-भार के आधार पर कम से कम 25 प्रतिशत राख को मिश्रित करने के लिए उपाय करेंगे :

परंतु ऐसे तापीय विद्युत केन्द्र नि:शुल्क राख प्रदान करके और परिवहन की लागत को वहन करके या पारस्परिक सहमत हुई शर्तों पर लिए गए निर्णय के अनुसार लागत या परिवहन व्यवस्था करके राख की अपेक्षित मात्रा की उपलब्धता को सुकर बनायेंगे और खानों के खाली स्थानों और ढेरो में अधिकभार के साथ राख को मिश्रित करना, सृजित अधिभार के लिए इस अधिसूचना के प्रकाशन की तिथि से लागू होगा और उक्त कार्यकलापों में राख का उपयोग, केंद्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक खान सुरक्षा और भारतीय खदान ब्यूरो द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा।

स्पष्टीकरण .- इस उप-पैरा के प्रयोजन के लिए यह भी स्पष्ट किया जाता है कि लागत मुक्त राख और नि:शुल्क परिवहन के उपबंध केवल तभी लागू होंगे यदि ताप विद्युत संयंत्र इसके लिए खान मालिक को नोटिस देते हैं और अधिभार वाले ढेर के साथ मिश्रित करने और खान में खाली स्थान को भरने के लिए राख के 25 प्रतिशत हिस्से के उपयोग का अधिदेश तब तक लागू नहीं होगा जब तक कि ताप विद्युत संयंत्र द्वारा खान मालिक को नोटिस न दिया गया हो।

(5) (i) सभी खान मालिकों को खान में खाली स्थानों में राख को समायोजित करने के लिए खान बंद योजना (प्रगामी और अंतिम) तैयार करनी होगी और खान में खाली स्थान में राख के निपटान और अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खान योजनाओं को संबंधित प्राधिकारी अनुमोदित करेगा। पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय द्वारा ताप विद्युत संयंत्रों और कोयला खदानों की पर्यावरणीय मंजूरी की अपेक्षा से छूट देने के साथ-साथ ऐसे निपटान के लिए अपनाए जाने वाले दिशानिर्देशों के संबंध में तारीख 28 अगस्त, 2019 को दिशानिर्देश जारी किए गए।

(ii) मंत्रालय, केन्द्रीय प्रदूषण नियंत्रण बोर्ड, महानिदेशक, खान सुरक्षा (डीजीएमएस) और भारतीय खान ब्यूरो (आईबीएम) के साथ परामर्श करके, खानों में खाली स्थानों में राख के निपटान करने तथा अधिभार वाले ढेरो में इसे मिश्रित करना सुगम बनाने के लिए समय-समय पर आगे भी दिशानिर्देश जारी कर सकता है और यह खान मालिकों की जिम्मेदारी होगी कि वे ऐसी खानों को अभिज्ञात करने की तिथि से एक वर्ष के भीतर विभिन्न विनियामक प्राधिकरणों द्वारा जारी की गई अनुमतियों में आवश्यक संशोधन या परिवर्तन प्राप्त करेंगे।

(6) (i) पर्यावरणीय प्रदूषण के संदर्भ में सुरक्षा, व्यवहार्यता (आर्थिक व्यवहार्यता नहीं) और पहलुओं की जांच सहित राख से खान में खाली स्थान को वापस भरने/अधिभार वाले ढेर के साथ राख को मिश्रित करने के लिए खानों की पहचान करने के लिए पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, विद्युत मंत्रालय, खान मंत्रालय, कोयला मंत्रालय, महानिदेशक खान सुरक्षा और भारतीय खान ब्यूरो से प्रतिनिधियों को शामिल करते हुए अध्यक्ष, केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा और यह समिति पणधारी मंत्रालयों या विभागों के लिए अभिज्ञात खानों (भूमिगत और खुली, दोनों) के संबंध में तैयार की गई तिमाही रिपोर्टों को अद्यतन करेगी और यह समिति, इस अधिसूचना के प्रकाशन के तुरंत पश्चात उपयुक्त खानों की पहचान करना आरंभ करेगी।

(ii) ताप विद्युत संयंत्र या खानें, उपरोक्त अनुसार अधिदेशित उपयोग लक्ष्यों को पूरा करने के लिए उपर्युक्त समिति द्वारा पहचान किए जाने तक राख के निपटान हेतु प्रतीक्षा नहीं करेंगी।

(7) राख से निचले क्षेत्र को भरने का कार्य, अनुमोदित परियोजनाओं के लिए राज्य प्रदूषण नियंत्रण बोर्ड की पूर्व अनुमति से और केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित दिशा-निर्देशों के अनुसार किया जाएगा और राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति द्वारा अनुमोदित स्थलों, अवस्थान, क्षेत्र और अनुमत मात्रा को अपनी वेबसाइट पर प्रतिवर्ष प्रकाशित किया जाएगा।

(8) केन्द्रीय प्रदूषण नियंत्रण बोर्ड, संगत पणधारी के साथ मिलकर, राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा अनुमति प्रदान करने के लिए समयबद्ध ऑनलाइन आवेदन प्रक्रिया प्रस्तुत करने के साथ-साथ इस अधिसूचना के अधीन परिकल्पित सभी प्रकार के कार्यकलापों के लिए एक वर्ष के भीतर दिशानिर्देश प्रस्तुत करेगा।

(9) कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र से तीन सौ किलोमीटर के दायरे में स्थित सभी भवन निर्माण परियोजनाएं (केंद्रीय, राज्य और स्थानीय प्राधिकरणों सरकारी उपक्रमों, अन्य सरकारी अभिकरणों तथा सभी निजी अभिकरणों) राख की ईंटों, टाईल्स, धातुमल राख अथवा अन्य राख आधारित उत्पादों का उपयोग करेंगी बशर्ते कि वे वैकल्पिक उत्पादों की कीमत से अधिक कीमत पर उपलब्ध न हो।

(10) राख आधारित उत्पादों के विनिर्माण और ऐसे उत्पादों में राख के उपयोग में भारतीय मानक ब्यूरो, भारतीय सड़क कांग्रेस और केंद्रीय प्रदूषण नियंत्रण बोर्ड द्वारा निर्धारित विनिर्देशों और दिशानिर्देशों की अनुपालना होगी।

ग. गैर-अनुपालन के लिए पर्यावरणीय प्रतिकर .-

(1) तीन वर्ष के चक्र के प्रथम दो वर्षों में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव और/ या सह-उत्पादक स्टेशनों या दोनों सहित) ने कम-से-कम 80 प्रतिशत राख (फ्लाई-राख और बॉटम-राख) उपयोग नहीं की है तो ऐसे गैर-अनुपालन ताप विद्युत संयंत्रों पर प्रस्तुत की गई वार्षिक रिपोर्टों के आधार पर वित्तीय वर्ष के

अंत में अप्रयुक्त राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि यह तीन वर्ष के चक्र के तीसरे वर्ष में 100 प्रतिशत राख का उपयोग करने में असमर्थ रहता है, तो वह अप्रयुक्त मात्रा पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर के भुगतान का पात्र होगा, जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगायी गयी है।

परंतु पर्यावरणीय प्रतिकर को पैरा क के उप-पैरा (4) में उल्लिखित विभिन्न उपयोगी श्रेणियों के अनुसार प्रथम अनुपालन चक्र के अंतिम वर्ष के अंत में अनुमान लगाया जाएगा और अधिरोपित किया जाएगा।

(2) अधिकारियों द्वारा एकत्रित पर्यावरणीय प्रतिकर को केन्द्रीय प्रदूषण नियंत्रण बोर्ड के निर्दिष्ट खाते में जमा किया जाएगा।

(3) लैगेसी राख के मामले में, यदि कोयला या लिग्नाइट आधारित तापीय ऊर्जा संयंत्र (कैप्टिव या सह-उत्पादक स्टेशनों या दोनों सहित) ने स्थापित क्षमता पर आधारित उत्पन्न राख का कम-से-कम 20 प्रतिशत (प्रथम वर्ष के लिए), 35 प्रतिशत (द्वितीय वर्ष के लिए), 50 प्रतिशत (तीसरे से दसवें वर्ष तक) उपयोग के बराबर लक्ष्य प्राप्त नहीं किया है तो उस वित्तीय वर्ष के दौरान अप्रयुक्त लैगेसी राख पर 1000 रुपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा और यदि 10 वर्ष के अंत में लैगेसी राख का उपयोग नहीं किया जाता है तो 1000 रुपए प्रति टन की दर से शेष अप्रयुक्त मात्रा पर पर्यावरणीय प्रतिकर लगाया जाएगा जिस पर पहले पर्यावरणीय प्रतिकर नहीं लगाया गया है।

(4) अधिकृत खरीददारों या उपभोक्ता अभिकरणों तक राख भेजने की जिम्मेदारी परिवाहकों या वाहन मालिक की जिम्मेदारी है और यदि इसका अनुपालन नहीं किया जाता है, तो अनधिकृत उपयोगकर्ताओं अथवा गैर-अधिकृत उपयोगर्ताओं को ऐसी मात्रा गलत तरीके से वितरित करने पर 1500 रूपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगायी, इसके अतिरिक्त राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा गैर अनुपालनकर्ता परिवाहकों पर अभियोजन लागू होगा।

(5) इस अधिसूचना के पैरा ख में विहित पर्यावरण अनुकूल तरीके में राख के उपयोग की जिम्मेदारी खरीददार या उपभोगकर्ता एजेंसियों की है और ऐसा नहीं करने पर केन्द्रीय प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा 1500 रूपए प्रति टन की दर से पर्यावरणीय प्रतिकर लगाया जाएगा।

(6) यदि उपयोगकर्ता अधिकरण पैरा ख के अधीन निर्धारित सीमा तक अथवा पैरा घ के उप-पैरा (1) के अधीन, दिए गए नोटिस के माध्यम से सूचित की गई सीमा, इनमें से जो भी कम हो, तक राख का उपयोग नहीं करती है, वे अतिरिक्त राख की मात्रा का 1500 रूपए प्रति टन की दर से भुगतान करने के लिए उत्तरदायी होंगी।

परंतु भवन निर्माण के संबंध में पर्यावरणीय प्रतिकर निर्मित क्षेत्र के 75 रूपये प्रति वर्ग फीट की दर से वसूल किया जाएगा।

(7) (i) ताप विद्युत संयंत्रों अन्य बकायादारों से केन्द्रीय प्रदूषण नियंत्रण बोर्ड द्वारा लगायी गई का पर्यावरणीय प्रतिकर उपयोग अप्रयुक्त राख के सुरक्षित निपटान हेतु किया जाएगा और राख आधारित उत्पादों सहित राख के उपयोग के संबंध में और अधिक अनुसंधान करने के लिए भी निधि का उपयोग किया जा सकता है।

(ii) अप्रयुक्त मात्रा पर लगाए गए पर्यावरणीय प्रतिकर के पश्चात भी राख के उपयोग का उत्तरदायित्व ताप विद्युत संयंत्रों की होगी और यदि पश्चातवर्ती चक्रों में पर्यावरणीय प्रतिकर लगाने के पश्चात ताप विद्युत संयंत्र, किसी विशेष चक्र की राख के उपयोग के लक्ष्य को प्राप्त करता है तो अगले चक्र के दौरान अप्रयुक्त मात्रा पर एकत्र की गई पर्यावरणीय प्रतिकर में 10 प्रतिशत कटौती के पश्चात उक्त रकम ताप विद्युत संयंत्र को वापस कर दी जाएगी और पश्चातवर्ती चक्रों में राख के उपयोग के मामले में एकत्र की गई पर्यावरणीय प्रतिकर की 20 प्रतिशत, 30 प्रतिशत और उसी क्रम में कटौती की जानी है।

घ. राख या राख आधारित उत्पादों की आपूर्ति हेतु प्रक्रिया .–

(1) ताप विद्युत संयंत्रों के स्वामी अथवा राख की ईंटों या टाईल्स या धातुमल आधारित राख के विनिर्माता उन व्यक्तियों या अभिकरणों को लिखित सूचना देंगे जो बिक्री या परिवहन या दोनों के लिए प्रस्तुत राख या राख आधारित उत्पादों के उपयोग के लिए उत्तरदायी हैं।

(2) ऐसे व्यक्ति या उपयोगकर्ता अभिकरणों जिन्हें ताप विद्युत संयंत्रों के स्वामी द्वारा या राख की ईंटों या टाईल्स या धातुमल आधारित राख के उत्पादकों द्वारा सूचना दी गई है, यदि वे पहले ही राख या राख उत्पादों के उपयोग के प्रयोजन से अन्य अभिकरणों के साथ जुड़े हुए हैं, यदि वे किसी भी राख/राख उत्पादों का उपयोग नहीं कर सकते हैं अथवा कम मात्रा का उपयोग कर सकते हैं, तदनुसार ताप विद्युत संयंत्र को सूचित करेंगे।

ड. प्रवर्तन, निगरानी, लेखा परीक्षा और प्रतिवेदन करना

(1) केंद्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी), उपबंधों के अनुपालना सुनिश्चित करने के लिए प्रवर्तन और निगरानी प्राधिकरण होंगे। सीपीमीवी या एमपीसीबी या पीसीसी तिमाही आधार पर राख के उपयोग की निगरानी करेंगे और सीपीसीवी इस प्रयोजन के लिए अधिसूचना की प्रकाशन की तारीख से छ: माह के भीतर एक पोर्टल विकसित करेगा। संबंधित जिला अधिकारी के पास इस अधिसूचना के उपबंधों को लागू करने और निगरानी करने के लिए समवर्ती अधिकारिता होगी।

(2) (i) ताप विद्युत संयंत्र, राख उत्सर्जन और उपयोग से संबंधित मासिक सूचना वेब पोर्टल पर अगले महीने की 5 तारीख तक अपलोड करेगा। कोयला या लिग्नाइट आधारित ताप ऊर्जा संयंत्रों द्वारा केंद्रीय प्रदूषण नियंत्रण बोर्ड, संबंधित राज्य प्रदूषण नियंत्रण बोर्ड या प्रदूषण नियंत्रण समिति (पीमीसी), केंद्रीय विद्युत प्राधिकरण (सीईए) और पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय के संबंधित एकीकृत क्षेत्रीय कार्यालयों को इस अधिसूचना के उपबंधों के अनुपालन संबंधी सूचना उपलब्ध कराते हुए वार्षिक कार्यान्वयन रिपोर्ट प्रत्येक वर्ष (1 अप्रैल से 31 मार्च तक की अवधि के लिए) अप्रैल माह के 30वें दिन तक प्रस्तुत की जाएगी। सीपीसीबी और सीईए द्वारा सभी ताप विद्युत संयंत्रों द्वारा प्रस्तुत वार्षिक रिपोर्टों का समेकन किया जाएगा और उसे पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय को 31 मई तक प्रस्तुत किया जाएगा।

(ii) सभी अन्य उपयोगकर्ता अधिकरण पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय या राज्य स्तरीय पर्यावरण प्रभाव आकलन प्राधिकरण (एसईआईएए) द्वारा जारी पर्यावरणीय मंजूरी (ईसी) अथवा राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) द्वारा जारी संचालन की सहमति (सीटीओ), जो भी लागू हो, की अनुपालना रिपोर्ट में इस अधिसूचना में आज्ञापकता के अनुसार राख के उपभोग या उपयोग या निस्तारण तथा राख आधारित उत्पादों के उपयोग संबंधी सूचना प्रस्तुत करेंगे। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) या राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीमीसी) अधिसूचना के उपबंधों के प्रभावी कार्यान्वयन की समीक्षा करने हेतु ताप विद्युत संयंत्रों के अतिरिक्त अन्य सभी अधिकरणों की राख उपयोग की वार्षिक रिपोर्ट प्रकाशित करेंगे।

(3) इस अधिसूचना के उपबंधों की निगरानी और कार्यान्वयन के प्रयोजन के लिए केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) की अध्यक्षता में एक समिति का गठन किया जाएगा जिसके सदस्य विद्युत मंत्रालय, कोयला मंत्रालय, खनन मंत्रालय, पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय, सड़क परिवहन और राजमार्ग मंत्रालय और भारी उद्यम विभाग से होने के साथ-साथ समिति के अध्यक्ष द्वारा नामित किए जाने वाले कोई संबंधित पणधारी होंगे। यह समिति संगत पणधारी को आमंत्रित कर सकती है। यह समिति इस अधिसूचना के उपबंधों के प्रभावी और दक्ष कार्यान्वयन के लिए सिफारिशें कर सकती है। यह समिति छ: माह में कम से कम एक बार एक बैठक करेगी और वार्षिक कार्यान्वयन रिपोर्टों की समीक्षा करेगी और यह समिति, इस अधिसूचना द्वारा आजापक किए गए अनुसार छ: महीनों में कम से कम एक बार संगत पणधारी (को) को आमंत्रित करके राख के उपयोग की निगरानी करने के लिए पणधारी से साथ परामर्शदात्री बैठकें आयोजित करेगी। यह समिति पर्यावरण, वन और जलवायु परिवर्तन मंत्रालय (एमओईएफसीसी) को छ: मासिक रिपोर्ट प्रस्तुत करेगी।

(4) ताप विद्युत संयंत्रों और राख के उपयोगकर्ताओं या राख आधारित उत्पादों के विनिर्माताओं के बीच के विवाद का समाधान करने के प्रयोजन से राज्य सरकारें या संघ राज्यक्षेत्र की सरकारें इस अधिसूचना के प्रकाशन की तारीख से तीन माह के भीतर राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) की अध्यक्षता में एक समिति का गठन करेंगी जिसमें विद्युत विभाग के प्रतिनिधि और एक प्रतिनिधि उस विभाग का होगा, जो विवाद वाले संबंधित अभिकरण का कार्य देख रहे हैं।

(5) केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) द्वारा प्राधिकृत लेखा परीक्षकों द्वारा ताप विद्युत संयंत्रों और उपयोगकर्ता अभिकरणों द्वारा किए गए राख के निपटान की अनुपालन लेखा परीक्षा संचालित की जाएगी और लेखा परीक्षा की रिपोर्ट प्रत्येक वर्ष 30 नवम्बर तक केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) को प्रस्तुत की जाएगी। केन्द्रीय प्रदूषण नियंत्रण बोर्ड (सीपीसीबी) और संबंधित राज्य प्रदूषण नियंत्रण बोर्ड (एसपीसीबी) या प्रदूषण नियंत्रण समिति (पीसीसी) लेखा परीक्षा की रिपोर्ट प्राप्त होने के पंद्रह दिनों के भीतर अनुपालन न करने वाले ताप विद्युत संयंत्रों के विरूद्ध कार्रवाई प्रारंभ करेगें।

[फा. सं. एचएसएम-9/1/2019-एचएसएम]

नरेश पाल गंगवार, संयुक्त सचिव

उपाबंध

31 मई तक अथवा उससे पहले प्रस्तुत की जाने वाली राख संबंधी उपबंधों की अनुपालन रिपोर्ट (01 अप्रैल से 31 मार्च की अवधि के लिए)।

क्र.सं.	ब्यौरा	
1.	विद्युत संयंत्र का नाम	
2.	कंपनी का नाम	
3.	जिला	
4.	राज्य	
5.	पत्राचार के लिए डाक का पता :	
6.	ई-मेल :	
7.	विद्युत संयंत्र की संस्थापित क्षमता (मेगा वॉट) :	
8.	संयंत्र लोड फैक्टर (पीएलएफ) :	
9.	उत्पादित यूनिटों की संख्या (एमडब्ल्यूएच) :	
10.	विद्युत संयंत्र के अंतर्गत कुल क्षेत्र (हेक्टेयर) (राख कुंडों के अधीन क्षेत्र सहित) :	
11.	रिपोर्टिंग की अवधि के दौरान कोयला खपत की मात्रा (प्रति वर्ष मीट्रिक टन) :	
12.	औसत राख सामग्री प्रतिशतता में (%) :	
13.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख की मात्रा (प्रति वर्ष मीट्रिक टन) : फ्लाई राख (प्रति वर्ष मीट्रिक टन) : बॉटम राख (प्रति वर्ष मीट्रिक टन) :	
14.	ड्राई फ्लाई राख भंडारण गड्ढा (गड्ढों) की क्षमता (मीट्रिक टन) :	
15.	**रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख के उपयोग का ब्यौरा:** (क) रिपोर्टिंग की अवधि के दौरान वर्तमान में उपयोग की गई राख की	

	कुल मात्रा (एमटीपीए) : (ख) उपयोग की गई फ्लाई राख की मात्रा (एमटीपीए) : i. फ्लाई-एश आधारित उत्पाद (ईंट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड/पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : (ग) उपयोग किए गए तल के राख की मात्रा (एमटीपीए) : i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर सीमेंट शीट या पाइप या बोर्ड या पैनल) : ii. सीमेंट विनिर्माण : iii. रेडी मिक्स कंक्रीट : iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री : v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण : vi. सड़कों, सड़क और फ्लाईओवर के पुश्तों का निर्माण : vii. बांधों का निर्माण : viii. निम्न भू-क्षेत्र का भराव : ix. खनिज क्षेत्रों का भराव : x. अधिभार वाले डम्पों में उपयोग : xi. कृषि : xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण : xiii. अन्य देशों को राख का निर्यात : xiv. अन्य (कृपया विनिर्दिष्ट करें) : रिपोर्टिंग की अवधि के दौरान वर्तमान में अप्रयुक्त राख की कुल मात्रा (एमटीपीए :	
16.	रिपोर्टिंग की अवधि के दौरान वर्तमान में उत्पादित राख का प्रतिशतता उपयोग (%) :	
17.	**राख कुंडों में राख के निपटान का ब्यौरा** क) तारीख 31 मार्च तक (रिपोर्टिंग की अवधि को छोड़कर) राख कुण्ड (कुण्डों) में निपटान किए गए राख की कुल मात्रा (मीट्रिक टन):	

	ख) रिपोर्टिंग की अवधि के दौरान राख कुण्ड (कुण्डों) में निपटान किए गए राख की मात्रा (मीट्रिक टन): ग) रिपोर्टिंग की अवधि के दौरान राख कुण्डों में गारा निस्सरण हेतु खपत हुए जल की कुल मात्रा (मी^{3}): घ) राख कुण्डों की कुल संख्या: (i) सक्रिय: (ii) खाली किए गए (पुन: भरा जाना है) (iii) पुन: भरे गए: ड.) राख कुण्डों के अधीन कुल क्षेत्र (हेक्टेयर):	
18.	**अलग-अलग राख कुण्ड का ब्यौरा** *राख कुण्ड 1,2 आदि (यदि राख कुण्डों की संख्या एक से अधिक हो, तो कृपया निम्नलिखित ब्यौरा अलग से उपलब्ध कराएं)* क) स्थिति: निर्माणाधीन या सक्रिय या खाली किया गया या पुन: भरा गया ख) राख कुण्ड में राख का निपटान शुरू करने की तारीख/महीना/वर्ष या महीना/वर्ष): ग) राख कुण्ड की क्षमता पूर्ण किए जाने के पश्चात् उसमें राख निपटान रोकने की तारीख (तारीख/महीना/वर्ष या महीना/वर्ष): (सक्रिय राख कुण्डों के लिए लागू नहीं) ग) क्षेत्र (हेक्टेयर): घ) डाइक की ऊंचाई (मी.): घ) आयतन (मी^{3}): ड.) तारीख 31 मार्च तक निपटान किए गए राख की मात्रा (मीट्रिक टन): च) उपलब्ध आयतन का प्रतिशत (%) और आगे निपटान किए जा सकने वाले राख की मात्रा (मीट्रिक टन): छ) राख कुण्ड के भरे जाने की अनुमानित अवधि (वर्षों और महीनों की संख्या): ड.) निर्देशांक (अक्षांश और देशान्तर): (कृपया न्यूनतम 4 निर्देशांकों को विनिर्दिष्ट करें) ज) राख कुण्ड में की गई लाइनिंग का प्रकार: एचडीपीई लाइनिंग या एलडीपीई लाइनिंग या क्ले लाइनिंग या कोई लाइनिंग नहीं छ) निपटान की विधि: शुष्क निपटान या नम गारा (नम गारा के मामले में कृपया विनिर्दिष्ट करें कि क्या एचसीएसडी या एमसीएसडी या एलसीएसडी है) ज) राख का अनुपात: गारा मिश्रण में जल (1:____): झ) संस्थापित और कार्यशील राख जल पुनर्चक्रण प्रणाली (एडब्ल्यूआरएस): हां या नहीं ञ) जमीन के अंदर या जल निकाय में राख कुण्ड से निस्सरित अपशिष्ट जल की मात्रा (मी^{3}): ट) डाइक की स्थिरता का अध्ययन कराए जाने की पिछली तारीख और उस संगठन का नाम जिसने अध्ययन किया: ठ) लेखा-परीक्षा किए जाने की पिछली तारीख और उस संगठन का नाम जिसने लेखा-परीक्षा की:	
19.	उपयोग किए गए पुराने राख की मात्रा (एमटीपीए): i. फ्लाई-एश आधारित उत्पाद (ईट या ब्लॉक या टाइल्स या फाइबर	

	सीमेंट शीट या पाइप या बोर्ड या पैनल): ii. सीमेंट विनिर्माण: iii. रेडी मिक्स कंक्रीट: iv. राख और जीओ-पॉलिमर आधारित निर्माण सामग्री: v. सिंटर्ड या कोल्ड बॉन्डेड राख एग्रीगेट का निर्माण: vi. सड़कों, सड़क और फ्लाई ओवर के पुश्तों का निर्माण: vii. बांधों का निर्माण: viii. निम्न भू-क्षेत्र का भराव: ix. खनिज क्षेत्रों का भराव: x. अधिभार वाले डम्पों में उपयोग: xi. कृषि: xii. तटीय जिलों में तटरेखा सुरक्षा संरचनाओं का निर्माण: xiii. अन्य देशों को राख का निर्यात xiv. अन्य (कृपया विनिर्दिष्ट करें):	

20. **सार :**

ब्यौरा	सृजित मात्रा (एमटीपी)	उपयोग की गई मात्रा (एमटीपी) और (%)	शेष मात्रा (एमटीपी)
रिपोर्टिंग की अवधि के दौरान राख			
पुरानी राख			
कुल			

21.	कोई अन्य सूचना : वार्षिक अनुपालन रिपोर्ट, और विद्युत संयंत्रों और राख कुण्डों की शेष फाइलों की सॉफ्ट कॉपी ई-मेल:- moefcc-coalash@gov.in पर भेजी जाए।	
22.	प्राधिकृत हस्ताक्षरकर्ता के हस्ताक्षर	

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 31st December, 2021

S.O. 5481(E).—Whereas by notification of the Government of India in the erstwhile Ministry of Environment and Forests *vide* S.O.763 (E), dated the 14th September, 1999, as amended from time to time, the Central Government, issued directions for restricting the excavation of top soil for manufacturing of bricks and promoting the utilisation of fly ash in the manufacturing of building materials and in construction activity within a specified radius of three hundred kilometres from the coal or lignite based thermal power plants;

And whereas, to implement the aforesaid notification more effectively based on the polluter pays principle (PPP) thereby ensuring 100 per cent utilisation of fly ash by the coal or lignite based thermal power plants and for the sustainability of the fly ash management system, the Central Government reviewed the existing notification; and whereas environmental compensation needs to be introduced based on the polluter pays principle;

And whereas, there is a need to conserve top soil by promoting manufacture and mandating use of ash based products and building materials in the construction sector;

And whereas, there is a need to conserve top soil and natural resources by promoting utilisation of ash in road laying, road and flyover embankments, shoreline protection measures, low lying areas of approved projects, backfilling of mines, as an alternative for filling of earthen materials;

And whereas, it is necessary to protect the environment and prevent the dumping and disposal of fly ash discharged from coal or lignite based thermal power plants on land;

And whereas, in the said notification the phrase 'ash', has been used which includes both fly ash as well as bottom ash generated from the Coal or Lignite based thermal power plants;

And whereas, the Central Government intends to bring out a comprehensive framework for ash utilisation including system of environmental compensation based on polluter pays principle;

And whereas, a draft notification on ash utilisation by coal or lignite thermal power plants in supersession of the notification of the Government of India, Ministry of Environment and Forests published in the Gazette of India, Extra Ordinary part II, section 3, sub-section (i) *vide* S.O.763 (E), dated the 14th September, 1999, by notification in exercise of the powers conferred under sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, was published in the Gazette of India, Extraordinary, Part II, section 3, sub-section (i), *vide* G.S.R. 285(E), dated the 22nd April, 2021 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of sixty days from the date on which copies of the Gazette containing the said draft provisions were made available to the public;

And, whereas all the objections and suggestions received from all persons likely to be affected thereby in respect of the said draft notification have been duly considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) and clause (v) of sub-section (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986) read with clause (d) of sub-rule (3) of rule (5) of the Environment (Protection) Rules, 1986, and in supersession of the Notification S.O.763 (E), dated the 14th September, 1999 except as respect things done or omitted to be done before such supersession, the Central Government hereby issues the following notification on ash utilisation from coal or lignite thermal power plants which shall come into force on the date of the publication of this notification, namely:-

A. Responsibilities of thermal power plants to dispose fly ash and bottom ash.—

(1) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall be primarily responsible to ensure 100 per cent utilisation of ash (fly ash, and bottom ash) generated by it in an eco-friendly manner as given in sub-paragraph (2);

(2) The ash generated from coal or lignite based thermal power plants shall be utilised only for the following eco-friendly purposes, namely:-

(i) Fly ash based products viz. bricks, blocks, tiles, fibre cement sheets, pipes, boards, panels;

(ii) Cement manufacturing, ready mix concrete;

(iii) Construction of road and fly over embankment, Ash and Geo-polymer based construction material;

(iv) Construction of dam;

(v) Filling up of low lying area;

(vi) Filling of mine voids;

(vii) Manufacturing of sintered or cold bonded ash aggregate;

(viii) Agriculture in a controlled manner based on soil testing;

(ix) Construction of shoreline protection structures in coastal districts;

(x) Export of ash to other countries;

(xi) Any other eco-friendly purpose as notified from time to time.

(3) A committee shall be constituted under the chairmanship of Chairman, Central Pollution Control Board (CPCB) and having representatives from Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Power, Ministry of Mines, Ministry of Coal, Ministry of Road Transport and Highways, Department of Agricultural Research and Education, Institute of Road Congress, National Council for Cement and Building Materials, to examine and review and recommend the eco-friendly ways of utilisation of ash and make inclusion or exclusion or modification in the list of such ways as mentioned in Sub-paragraph (2) based on technological developments and requests received from stakeholders. The committee may invite State Pollution Control Board or Pollution Control Committee, operators of thermal power plants and mines, cement plants and other stakeholders as and when required for this purpose. Based on the recommendations of the Committee, Ministry of Environment, Forest and Climate Change (MoEFCC) may publish such eco-friendly purpose.

(4) Every coal or lignite based thermal power plant shall be responsible to utilise 100 per cent ash (fly ash and bottom ash) generated during that year, however, in no case shall utilisation fall below 80 per cent in any year, and the thermal power plant shall achieve average ash utilisation of 100 per cent in a three years cycle:

Provided that the three years cycle applicable for the first time is extendable by one year for the thermal power plants where ash utilisation is in the range of 60-80 per cent, and two years where ash utilisation is below 60 per cent and for the purpose of calculation of percentage of ash utilisation, the percentage quantity of utilisation in the year 2021- 2022 shall be taken into account as per the table below:

Utilisation percentages of thermal power plants	First compliance Cycle to meet 100 per cent utilisation	Second compliance cycle onwards, to meet 100 per cent utilisation
>80 per cent	3 years	3 years
60-80 per cent	4 years	3 years
<60 per cent	5 years	3 years

Provided further that the minimum utilisation percentage of 80 per cent shall not be applicable to the first year and first two years of the first compliance cycle for the thermal power plants under the utilisation category of 60-80 per cent and <60 per cent, respectively.

Provided also that 20per cent of ash generated in the final year of compliance cycle may be carried forward to the next cycle which shall be utilised in the next three years cycle along with the ash generated during that cycle.

(5) The unutilised accumulated ash i.e. legacy ash, which is stored before the publication of this notification, shall be utilised progressively by the thermal power plants in such a manner that the utilization of legacy ash shall be completed fully within ten years from the date of publication of this notification and this will be over and above the utilisation targets prescribed for ash generation through current operations of that particular year:

Provided that the minimum quantity of legacy ash in percentages as mentioned below shall be utilised during the corresponding year and the minimum quantity of legacy ash is to be calculated based on the annual ash generation as per installed capacity of thermal power plant.

Year from date of publication	1st	2nd	3rd -10th
Utilisation of legacy ash (in percentage of Annual ash)	At least 20 per cent	At least 35 per cent	At least 50 per cent

Provided further that the legacy ash utilisation shall not be required where ash pond or dyke has stabilised and the reclamation has taken place with greenbelt or plantation and the concerned State Pollution Control Board shall certify in this regard. Stabilisation and reclamation of an ash pond or dyke including certification by the Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be carried out within a year from the date of publication of this notification. The ash remaining in all other ash ponds or dykes shall be utilised in progressive manner as per the above mentioned timelines.

Note: The obligations under sub-paragraph (4) and (5) above for achieving the ash utilisation targets shall be applicable from 1st April, 2022.

(6) Any new as well as operational thermal power plant may be permitted an emergency or temporary ash pond with an area of 0.1 hectare per Mega Watt (MW). Technical specifications of ash ponds or dykes shall be as per the guidelines of Central Pollution Control Board (CPCB) made in consultation with Central Electricity Authority (CEA) and these guidelines shall also lay down a procedure for annual certification of the ash pond or dyke on its safety, environmental pollution, available volume, mode of disposal, water consumption or conservation in disposal, ash water recycling and greenbelt, etc., and shall be put in place within three months from the date of publication of this notification.

(7) Every coal or lignite based thermal power plant shall ensure that loading, unloading, transport, storage and disposal of ash is done in an environmentally sound manner and that all precautions to prevent air and water pollution are taken and status in this regard shall be reported to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in Annexure attached to this notification.

(8) Every coal or lignite based thermal power plant shall install dedicated silos for storage of dry fly ash silos for at least sixteen hours of ash based on installed capacity and it shall be reported upon to the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in the Annexure and shall be inspected by Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) from time to time.

(9) Every coal or lignite based thermal power plant (including captive or co-generating stations or both) shall provide real time data on daily basis of availability of ash with Thermal Power Plant (TPP), by providing link to Central Pollution Control Board's web portal or mobile phone App for the benefit of actual user(s).

(10) Statutory obligation of 100 per cent utilisation of ash shall be treated as a change in law, wherever applicable.

B. **For the purpose of utilisation of ash, the subsequent sub-paras shall apply**.—

(1) All agencies (Government, Semi-government and Private) engaged in construction activities such as road laying, road and flyover embankments, shoreline protection structures in coastal districts and dams within 300 kms from the lignite or coal based thermal power plants shall mandatorily utilise ash in these activities:

Provided that it is delivered at the project site free of cost and transportation cost is borne by such coal or lignite based thermal power plants.

Provided further that thermal power plant may charge for ash cost and transportation as per mutually agreed terms, in case thermal power plant is able to dispose the ash through other means and those agencies makes a request for it and the provisions of ash free of cost and free transportation shall be applicable, if thermal power plant serves a notice on the construction agency for the same.

(2) The utilisation of ash in the said activities shall be carried out in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, Central Building Research Institute, Roorkee, Central Road Research Institute, Delhi, Central Public Works Department, State Public Works Departments and other Central and State Government Agencies.

(3) It shall be obligatory on all mines located within 300 kilometres radius of thermal power plant, to undertake backfilling of ash in mine voids or mixing of ash with external Overburden dumps, under Extended Producer Responsibility (EPR). All mine owners or operators (Government, Public and Private Sector) within three hundred kilometres (by road) from coal or lignite based thermal power plants, shall undertake measures to mix at least 25 per cent of ash on weight to weight basis of the materials used for external dump of overburden, backfilling or stowing of mine (running or abandoned as the case may be) as per the guidelines of the Director General of Mines Safety (DGMS):

Provided that such thermal power stations shall facilitate the availability of required quantity of ash by delivering ash free of cost and bearing the cost of transportation or cost or transportation arrangement decided on mutually agreed terms and mixing of ash with overburden in mine voids and dumps shall be applicable for the overburden generated from the date of publication of this notification and the utilisation of ash in the said activities shall be carried out in accordance with guidelines laid down by the Central Pollution Control Board, Director General of Mines Safety and Indian Bureau of Mines.

Explanation.- For the purpose of this sub-paragraph, it is also clarified that the provisions of ash free of cost and free transportation shall be applicable, if thermal power plants serve a notice on the mine owner for the same and the mandate of using 25 per cent of ash for mixing with overburden dump and filling up of mine voids shall not be applicable unless a notice is served on the mine owner by thermal power plant.

(4) (i) All mine owners shall get mine closure plans (progressive and final) to accommodate ash in the mine voids and the concerned authority shall approve mine plans for disposal of ash in mine voids and mixing of ash with overburden dumps. The Ministry of Environment, Forest and Climate Change (MoEFCC) has issued guidelines on 28th August, 2019 regarding exemption of requirement of Environmental Clearance of thermal power plants and coal mines along with the guidelines to be followed for such disposal.

(ii) The Ministry in consultation with Central Pollution Control Board (CPCB), Director General of Mine Safety (DGMS) and Indian Bureau of Mines (IBM) may issue further guidelines time to time to facilitate ash disposal in mine voids and mixing with overburden dumps and it shall be the responsibility of mine owners to get the necessary amendments or modifications in the permissions issued by various regulatory authorities within one year from the date of identification of such mines.

(5) (i) There shall be a committee headed by Chairperson, Central Pollution Control Board (CPCB) with representatives from Ministry of Environment, Forest and Climate Change, Ministry of Power, Ministry of Mines, Ministry of Coal, Director General of Mine Safety and Indian Bureau of Mines for identification of mines for backfilling of mine voids with ash or mixing of ash with overburden dump including examination of safety, feasibility (not economic feasibility) and aspects of environmental contamination and the committee shall get updated quarterly reports prepared regarding identified mines (both underground and opencast) for the stakeholder Ministries or Departments and the committee shall start identifying the suitable mines immediately after the publication of this notification.

(ii) Thermal power plants or mines shall not wait for disposal of ash till the identification is done by the above mentioned committee, to meet the utilisation targets mandated as above.

(6) Filling of low lying areas with ash shall be carried out with prior permission of the State Pollution Control Board or Pollution Control Committee for approved projects, and in accordance with guidelines laid down by Central Pollution Control Board (CPCB) and the State Pollution Control Board or Pollution Control Committee (PCC) shall publish approved sites, location, area and permitted quantity annually on its website.

(7) Central Pollution Control Board after engaging relevant stakeholders, shall put in place the guidelines within one year for all types of activities envisaged under this notification including putting in place time bound online application process for the grant permission by State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs).

(8) All building construction projects (Central, State and Local authorities, Govt. undertakings, other Govt. agencies and all private agencies) located within a radius of three hundred kilometres from a coal or lignite based thermal power plant shall use ash bricks, tiles, sintered ash aggregate or other ash based products, provided these are made available at prices not higher than the price of alternative products.

(9) Manufacturing of ash based products and use of ash in such products shall be in accordance with specifications and guidelines laid down by the Bureau of Indian Standards, Indian Road Congress, and Central Pollution Control Board.

C. Environmental compensation for non-compliance.—

(1) In the first two years of a three years cycle, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved at least 80 per cent ash (fly ash and bottom ash) utilisation, then such non-compliant thermal power plants shall be imposed with an environmental compensation of Rs. 1000 per ton on unutilised ash during the end of financial year based on the annual reports submitted and if it is unable to utilise 100 per cent of ash in the third year of the three years cycle, it shall be liable to pay an environmental compensation of Rs. 1000 per ton on the unutilised quantity on which environmental compensation has not been imposed earlier:

Provided that the environmental compensation shall be estimated and imposed at the end of last year of the first compliance cycle as per the various utilisation categories as mentioned in sub-paragraph (4) of Para A.

(2) Environmental compensation collected by the authorities shall be deposited in the designated account of Central Pollution Control Board.

(3) In case of legacy ash, if the coal or lignite based thermal power plant (including captive or co-generating stations or both) has not achieved utilisation equivalent to at least 20 per cent (for the first year), 35 per cent (for the second year), 50 per cent (for third to tenth year) of ash generated based on installed capacity, an environmental compensation of Rs. 1000 per ton of unutilised legacy ash during that financial year shall be imposed and if the utilization of legacy ash is not completed at the end of 10 years, an environmental compensation of Rs.1000 per ton shall be imposed on the remaining unutilised quantity which has not been imposed earlier.

(4) It shall be the responsibility of the transporters or vehicle owner to deliver ash to authorised purchaser or user agency and if it is not complied, then an environmental compensation of Rs. 1500 per ton on such quantity as mis-delivered to unauthorised users or non- delivered to authorised users will be imposed besides prosecution of such non-compliant transporters by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).

(5) It is the responsibility of the purchasers or user agencies to utilise ash in an eco-friendly manner as laid down at para B of this notification and if it is not complied. then an environmental compensation of Rs. 1500 or per ton shall be imposed by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC).

(6) If the user agencies do not utilise ash to the extent obligated under para B or the extent to which they have been intimated through Notice(s) served under sub-paragraph (1) of para D, whichever is lower, they shall be liable to pay Rs. 1500 per ton of ash for the quantity they fall short off:

Provided that the environmental compensation on building constructions shall be levied at Rs.75/- per square feet of built up area of construction.

(7) (i) The environmental compensation collected by Central Pollution Control Board from the thermal power plants and other defaulters shall be used towards the safe disposal of the unutilised ash and the fund may also be utilised for advancing research on use of ash including ash based products.

(ii) The liability of ash utilisation shall be with thermal power plants even after imposition of environmental compensation on unutilised quantities and in case thermal power plant achieves the ash utilisation of any

particular cycle after imposition of environmental compensation in subsequent cycles, the said amount shall be returned to thermal power plant after deducting 10 per cent of the environmental compensation collected on the unutilised quantity during the next cycle and deduction of 20 per cent, 30 per cent, and so on, of the environmental compensation collected is to be made in case of utilisation of ash in subsequent cycles.

D. Procedure for supply of ash or ash based products.—

(1) The owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate shall serve written notice to persons or agencies who are liable to utilise ash or ash based products, offering for sale, or transport or both.

(2) Persons or user agencies who have been served notices by owner of thermal power plants or manufacturers of ash bricks or tiles or sintered ash aggregate, if they have already tied up with other agencies for the purpose of utilisation of ash or ash products, shall inform the thermal power plant accordingly, if they cannot use any ash or ash products or use reduced quantity.

E. Enforcement, Monitoring, Audit and Reporting.—

(1) The Central Pollution Control Board (CPCB) and the concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall be the enforcing and monitoring authority for ensuring compliance of the provisions and shall monitor the utilisation of ash on quarterly basis. Central Pollution Control Board shall develop a portal for the purpose within six months of date of publication of the notification. The concerned District Magistrate shall have concurrent jurisdiction for enforcement and monitoring of the provisions of this notification.

(2) (i) Thermal power plants shall upload monthly information regarding ash generation and utilisation by 5th of the next month on the web portal. Annual implementation report (for the period 1st April to 31st March) providing information about the compliance of provisions in this notification shall be submitted by the 30th day of April, every year to the Central Pollution Control Board, concerned State Pollution Control Board or Pollution Control Committee (PCC), Central Electricity Authority (CEA), and concerned Integrated Regional Office of Ministry of Environment, Forest and Climate Change by the coal or lignite based thermal power plants. Central Pollution Control Board and Central Electricity Authority shall compile the annual reports submitted by all the thermal power plants and submit to Ministry of Environment, Forest and Climate Change by 31st May.

(ii) All other user agencies shall submit consumption or utilisation or disposal of ash and use of ash based products as mandated in this notification in the compliance report of Environmental Clearance (EC) issued by Ministry of Environment, Forest and Climate Change or State Level Environment Impact Assessment Authority (SEIAA) or Consent to Operate (CTO) issued by State Pollution Control Board (SPCB) or Pollution Control Committee (PCC), whichever is applicable. The Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall publish annual report of ash utilisation of all other agencies except thermal power plants to review the effective implementation of the provisions of the notification.

(3) For the purpose of monitoring the implementation of the provisions of this notification, a committee shall be constituted under the Chairperson, Central Pollution Control Board (CPCB), with members from Ministry of Power, Ministry of Coal, Ministry of Mines, Ministry of Environment, Forest and Climate Change, Ministry Road Transportation and Highways, Department of Heavy Industry as well as any concerned stakeholder(s), to be nominated by the Chairman of the committee. The committee may make recommendations for effective and efficient implementation of the provisions of the notification. The committee shall meet at least once in six months and review annual implementation reports and the committee shall also hold stakeholder consultations for monitoring of ash utilisation as mandated by this notification by inviting relevant stakeholder(s) at least once in six months. The committee shall submit the six monthly report to Ministry of Environment, Forest and Climate Change (MoEFCC).

(4) For the purpose of resolving disputes between thermal power plants and users of ash or manufacturer of ash based products, the State Governments or Union territory administration constitute a Committee within three months from the date of publication of this notification under the Chairman, State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) with representatives from Department of Power, and one representative from the Department which deals with the subject of concerned agency with which dispute is made.

(5) The compliance audit for ash disposal by the thermal power plants and the user agency shall be conducted by auditors, authorised by Central Pollution Control Board (CPCB) and audit report shall be submitted to Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) by 30th November every year. Central Pollution Control Board (CPCB) and concerned State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) shall initiate action against non-compliant thermal power plants within fifteen days of receipt of audit report.

[F. No. HSM-9/1/2019-HSM]

NARESH PAL GANGWAR, Jt. Secy.

Annexure

Ash Compliance Report (for the period 1st April-31st March) to be submitted on or before 31st May.

Sl. No.	Details	
1.	Name of Power Plant	
2.	Name of the company	
3.	District	
4.	State	
5.	Postal address for communication:	
6.	E-mail:	
7.	Power Plant installed capacity (MW):	
8.	Plant Load Factor (PLF):	
9.	No. of units generated (MWh):	
10.	Total area under power plant (ha): (including area under ash ponds)	
11.	Quantity of coal consumption during reporting period (Metric Tons per Annum):	
12	Average ash content in percentage (per cent):	
13.	Quantity of current ash generation during reporting period (Metric Tons per Annum): Fly ash (Metric Tons per Annum): Bottom ash (Metric Tons per Annum):	
14.	Capacity of dry fly ash storage silo(s) (Metric Tons) :	
15	Details of utilisation of current ash generated during reporting period (a) Total quantity of current ash utilised (MTPA) during reporting period: (b) Quantity of fly ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels) (ii) Cement manufacturing:	

	(iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and fly over embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts; (xiii) Export of ash to other countries: (xiv) Others (please specify): (c) Quantity of bottom ash utilised (MTPA): (i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): (ii) Cement manufacturing: (iii) Ready mix concrete: (iv) Ash and Geo-polymer based construction material: (v) Manufacturing of sintered or cold bonded ash aggregate: (vi) Construction of roads, road and flyover embankment: (vii) Construction of dams: (viii) Filling up of low lying area: (ix) Filling of mine voids: (x) Use in overburden dumps: (xi) Agriculture: (xii) Construction of shoreline protection structures in coastal districts: (xiii) Export of ash to other countries: (xiv) Others (please specify): Total quantity of current ash unutilised (MTPA) during reporting period:	
16.	Percentage utilisation of current ash generated during reporting period (per cent):	
17.	Details of disposal of ash in ash ponds (a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period): (b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons): (c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m^3): (d) Total number of ash ponds: (i) Active: (ii) Exhausted (yet to be reclaimed): (iii) Reclaimed: (e) total area under ash ponds (ha):	
18.	Individual ash pond details *Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)* (a) Status: Under construction or Active or Exhausted or	

	Reclaimed (b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY): (c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds) (c) area (hectares): (d) dyke height (m): (d) volume (m^3): (e) quantity of ash disposed as on 31st March (Metric Tons): (f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons): (g) expected life of ash pond (number of years and months): (e) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates) (f) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining g) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD) (h) Ratio of ash: water in slurry mix (1:___): (i) Ash water recycling system (AWRS) installed and functioning: Yes or No (j) Quantity of wastewater from ash pond discharged into land or water body (m3): (k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study: (l) Last date when the audit was conducted and name of the organisation who conducted the audit:	
19.	Quantity of legacy ash utilised (MTPA): i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels): ii. Cement manufacturing: iii. Ready mix concrete: iv. Ash and Geo-polymer based construction material: v. Manufacturing of sintered or cold bonded ash aggregate: vi. Construction of roads, road and flyover embankment: vii. Construction of dams: viii. Filling up of low lying area: ix. Filling of mine voids: x. Use in overburden dumps: xi. Agriculture: xii. Construction of shoreline protection structures in coastal districts; xiii. Export of ash to other countries: xiv. Others (please specify):	
20.	Summary:	

Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)

	Current ash during reporting period			
	Legacy ash			
	Total			
21.	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcc-coalash@gov.in			
22.	Signature of Authorised Signatory			

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