

एनएलसी इंडिया लिमिटेड

(भारत सरकार का 'नवरत्न' उद्यम)

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**Lr. No. NLCIL/GM/Comml./CERC/F-1142-020/2023**

**Dated:31-07-2023**

To

The Secretary,  
Central Electricity Regulatory Commission  
3<sup>rd</sup> and 4<sup>th</sup> floor, Chanderlok Building  
36, Janpath Marg,  
New Delhi – 110 001

Sir,

**Sub:** Hon'ble Commission's Approach Paper on determining terms and conditions of Tariff Regulation 2024-29- Remarks from NLCIL – Reg

**Ref:** File No. L-1/268/2022/CERC Dt 26-05-2023

Pursuant to the public notice cited in the reference, Hon'ble Commission has invited comments/suggestions from stakeholders on the matter discussed in the approach paper on determining Terms and Conditions of Tariff Regulation for Tariff Control period commencing from 1<sup>st</sup> Apr-2024. NLCIL is hereby submitting its comments/suggestions for kind perusal and consideration, as enclosed.

The above may be taken on record please.

Thanking you.

Yours Sincerely,  
For NLC India Limited

Deputy General Manager,  
Commercial Department.

Encl: As above

NLCIL's Comment on Approach Paper on determining Terms and Condition of Tariff Regulations - 2024-29

**1. Alternative Approach to Tariff Determination-**

*Approach 1: Shift to a normative tariff wherein, once capital costs are approved on an actual basis after a prudence check, all other AFC components are determined on normative basis, based on index.*

*Whether clustering the components of AFC based on their nature to increase/ decrease will allow better projections? Any other possible method to cluster the AFC components?*

**NLCIL Comment:**

**Existing Stations:**

As envisaged in the approach paper, indexation may be considered for tariff determination for the control period 2024-29, based on the truing up of 2019-24 actuals. At the end of the tariff control period 2024-29 based on truing up, indexation will be revised for 2024-29. The same can be adopted for issuance of the provisional tariff order for subsequent control period 2029-2034 also Hence the indexation shall be used only for the purpose of provisional tariff determination for 2024-29 and for truing up at the end of the control period 2029-24.

By this method, the necessity of filing of petition seeking provisional tariff for 2024-29 can be avoided and tariff order of 2024-29 may be issued along with truing up order of 2019-24.

In case of additional capitalization, over the time, certain clauses have been modified in Tariff Regulation 2019-24 vis-a-vis Tariff Regulation 2014-19 and earlier tariff regulation. For instance, the first proviso to the Regulation 14(3) of the Tariff Regulations, 2014 which stipulated non entitlement of minor assets claim under Additional capital expenditure for the existing stations had been withdrawn/repealed in Tariff Regulations 2019 and thus enabling the existing stations for such claims of additional capital expenditure under Regulation 25/26 of Tariff Regulations, 2019. Thus, the indexation factor for 2024-29 shall be considered based on the details submitted during control period 2019-24 alone as this only gives the correct picture of actual addl. Capital Expenditure allowed by the Commission.

**New Project:**

As mentioned in the approach paper, actual capital cost for the new projects, shall be taken into consideration for tariff determination upto the cutoff date (5 years from COD), and indexation method may be followed thereafter.

***Approach 2:** simplification of the existing Performance Based Hybrid Approach, wherein on the basis of admitted capital cost, AFC components can be approved based on actual or norms as may be specified for the control period. Further, additional capitalization may be allowed on certain counts on a normative basis.*

### **NLCIL Comment:**

The component of working capital decided as the receivables, interest rates, fuel cost etc are variable in nature and subject to vary with the Stations. Hence deciding normative value of such components is impractical.

Thus, the existing Performance Based Hybrid Approach can be continued.

### **2. Interim Tariff:**

*The provision for interim-tariff can be continued in the next tariff period as well. However, comments and suggestions are sought from stakeholders on the continuation of the said provision*

### **Current regulation 13(3):**

The CERC Tariff Regulations, 2019, allows utilities to seek approval of the interim true-up of Tariff in mid-way of the control period if the Annual Fixed costs increases by more than 20%.

### **NLCIL Comment:**

The provision of interim true-up Tariff can be continued as per the current regulation except for not specifying the 20% increase in AFC.

Therefore, in order to avoid incurrence of interest on differential tariff if the actual expenditures during the control period **deviates by 20% (both upward or downward)** with respect to Projected estimated values determined by the Commission, the generators shall be allowed to furnish such details for determination of interim **true-up tariff** before the Hon'ble Commission and Commission shall grant interim True-up tariff.

### **3. Procurement of Equipment and Services**

*Need to mandatorily award work and services contracts for developing projects under the regulated tariff mechanism through a transparent process of competitive bidding, duly complying with the policy/guidelines issued by the Government of India as applicable from time to time.*

### **NLCIL Comment:**

As a PSU, works are awarded duly complying with the policy/guidelines issued by the Government of India and CVC guidelines.

### **4. Reference Cost – Benchmark Cost V/s Investment Approval**

*Comments and suggestions of stakeholders are invited on other efficient reference costs other than Investment Approval costs that can be considered for prudence checks.*

**NLCIL Comment:**

- i. There are several differences with regard to site conditions, water handling, coal handling systems, Force majeure etc., for the plants having same capacity and fuel and therefore one benchmarked cost may not be a true representation of all such plants on the basis of which actual costs can be disallowed. Hence the existing practice of taking into account the cost mentioned in the Investment approval may be continued for computation of Capital Cost.
- ii. Investment approval as modified by Board/Gol may also be considered for finalizing capital cost of the project.

**5. Computation of IDC**

*Comments and suggestions are sought from stakeholders on the following options for allowing IDC:*

1. *Existing mechanism wherein the pro-rata deduction (based on delay not condoned) is done on IDC beyond SCOD.*
2. *Pro-rata IDC may be allowed considering the total implementation period wherein the actual IDC till implementation of the project is pro-rated considering the period upto SCOD and period of delay condoned over total implementation period.*
3. *IDC approved in the original Investment Approval to be considered while allowing actual IDC in case of delay.*

**Current Regulation:**

1. *Computation of IDC on normative loans in cases of equity infusion in excess of 30% and may be continued.*
2. *Currently if reason is not justified, IDC due to delay in COD is disallowed. Suggestion sought to proportionate the IDC till SCOD (of allowed delay) based on actual IDC till actual COD*

**NLCIL Comments:**

IDC is computed in the investment approval based on assumed project timelines and funding pattern. IDC is an essential part of the project cost and any disallowance would result in cost burden on the project developer as most of the delays which occur are beyond the control of the generating companies.

Where the generator did not incur any IDC till SCOD and interest liability for the project starts after SCOD in such case if the delay is not condoned, then the entire IDC gets disallowed.

Schedule Project Period	36	Months
Actual Project Period	48	Months
Total Delay	12	Months
Condoned Delay	4	Months
<b>Particulars (in Crs)</b>	<b>Case-I</b>	<b>Case-II</b>
IDC as per Investment Approval (A)	300	300
Actual IDC (B)	<b>300</b>	<b>500</b>
Actual IDC upto SCOD (C)	200	150
Actual IDC for Delay period (D)	100	350
Option I: $x = (C+D*4/12)$	233.33	266.6667
Option II: $y = (C+D)*(36+4)/(36+12)$	250	416.67

In view of the above, the Pro-rata IDC may be allowed considering the total implementation period wherein the actual IDC till implementation of the project is pro-rated considering the period upto SCOD and period of delay condoned over total implementation period.

However, in case when the pro-rated IDC is lesser than the IDC approved as in investment approval, the approved IDC shall be retained.

## 6. Treatment of LD

### Current Regulation:

- i. If delay reason is controllable by Generating Company: IDC/IEDC disallowed and LD will be allowed to be retained
- ii. If delay reason is an un-controllable factor for Generating Company: IDC/IEDC allowed and LD is to be deducted from the capital cost.

*Under the third scenario, based on APTEL order in appeal 72 of 2010, where partial delay is on account of the Generating Company and the rest of the delay is due to uncontrollable factors, then LD recovered, if any, should be shared equally between the beneficiaries and the Generating Company.*

### NLCIL Comments:

In view of APTEL Order in Appeal 72 of 2010, where partial delay is on account of the Generating Company and the rest of the delay is due to uncontrollable factors, then LD recovered, if any, can be shared equally between the beneficiaries and the Generating Company.

## 7. Price Variation

*It is observed that time overrun due to delay in commissioning of projects not only increases IDC and IEDC, it may also result in increase in the hard cost in case the contract provides for cost escalation beyond SCOD. In such cases, if the impact corresponding to such delay is disallowed for the delay not condoned, it appears logical to extend the same treatment to price variation. Therefore, for allowing price variation, the utilities may be mandated to submit the statutory auditor certificate along with the petition duly certifying the price variation corresponding to delay and the same may be allowed on pro-rata basis corresponding to the delay condoned. Further, a separate form may also be specified to submit the relevant information pertaining to price variation.*

### **NLCIL Comments:**

The price variation is supported by Revised cost estimate (RCE) approved by the Board of Directors of the Generating company or competent authority who has sanctioned the Project cost. Based on the RCE, cost and time over run may be allowed after prudence check.

Submission of Cost auditors certificate may also be allowed in lieu of statutory Auditor certificate (as per Company's act).

## 8. Renovation and Modernisation (R&M):

*"Utilities that opt for a special allowance for the first year of the tariff period shall have to continue with the same for the rest of the tariff period"*

### **NLCIL Comments:**

- If generator opts for special allowance at the beginning of control period, the same may be continued for the rest of the Tariff period.
- Upon expiry of useful life of a Generating Station, the special allowance covers the expenses towards renovation or revamping of system and equipment, to ensure it's sustained and efficient operation. This allowance covers expenses apart from that of regular O&M maintenance which generating station needs mandatorily. As it is discussed in the approach paper, older station having better performance should be incentivized, and since recovery of AFC is minimal after completion of useful life of the Generating Station, to incentivize the Older Generating Station with better efficiency, and to ensure its efficient operation even after completion of its useful life, special allowance shall be allowed, similar to normative O&M with escalation factor similar to O&M expenses. The concern raised by DISCOMs about uncertainty with performance of such Stations would already be addressed as the recovery of allowance is restricted to the actual PAF achieved by the Station.

## 9. Initial Spares:

*“Revised the provision by allowing separate initial spares norms for AIS Sub-station (Brown Field) at 6% and GIS Sub-station (Brown Field) at 7% and increasing the norm for Static Synchronous Compensator from 3.5% to 6%.”*

*Comments and suggestions are sought from stakeholders on the above proposed approach and alternative options to standardise and simplify the norms for initial spares.*

### **NLCIL Comments:**

Applicability for the Generating Station with GIS is to be clarified and may be included. In NNTPS, failure in GIS Components is observed in the 400KV Bus ducts needs stoppage of the Units forcibly and spares are costlier in nature and also depends upon the OEM for supply and rectification. Hence, 7% initial spares applicability for Generators with GIS SS may be considered by the commission in the proposed new regulation for the new projects.

## 10. Controllable and Uncontrollable Factors

*“Delays on account of forest clearances can also be considered for inclusion as uncontrollable factor provided that such delays are not attributable to the generating company or the transmission licensee. Comments and suggestions are sought from stakeholders on continued inclusion of delay on account of land acquisition as an uncontrollable factor and on the further inclusion of delay on account of forest clearances as an uncontrollable factor”*

### **NLCIL Comments:**

In Neyveli the lands were acquired under the aegis of District Administration, by invoking the provisions of Tamil Nadu Acquisition of Land for Industrial Purposes Act, 1997 (TN Act 10/1999). In the year 2014, GoI announced “Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCTLARR Act) 30/2013”, with effect from 01.01.2014 for acquisition of lands all over the country. Adhering to laws of state government and Central government NLCIL has taken all out efforts but district Administration could not acquire and hand over the lands required for mining front. As such, the delays in land acquisition are beyond the control of the generating stations, and so the issue of Land acquisition may be retained in the Tariff regulations 2024-29 under uncontrollable factors.

Further, currently delay in execution of the project on account of contractor/supplier/agency has been put under controllable factors. However, in certain cases where the main package contractor has gone for liquidation under “The Insolvency and Bankruptcy Code, 2016 (IBC)” due to filing by creditors before

NCLT, then such acts are beyond the control of the Generating Company. Hence, the act of insolvency by main package contractor may also be brought under uncontrollable factors.

## 11. Additional Capitalisation

*In order to have an enabling provision under which such additional capitalisation can be allowed with prior approval, a provision may be introduced to existing Regulation 26 to allow such expenses if they are found to be beneficial/essential for continued operations.*

*Comments and suggestions are sought from stakeholders on the above and any other ways to address the issue flagged above.*

### NLCIL comments

- Existing regulation provides for additional Capitalisation under certain grounds which will form part of capital cost and in turn **depreciation upto 90% of cost, return on equity and Interest on loan** will be received during remaining useful life of the station.
- If any normative special compensation allowance is allowed instead of additional Capitalization the same will be in the form of **reimbursement** only from the beneficiaries just like the existing compensation allowance or special allowance.
- The assets life will not be commensurate with that of the Generating stations. The generators incur additional capitalization by way of loan for replacing the assets which have served their useful life. Further due to obsolescence of technology, certain assets need replacement. The cost of such replacement may be high. Also capital additions are to be carried out due to Force majeure or change in Law. In such situations for any investment on capital additions, the existing regulations allow RoE and if the same is substituted with special compensation allowance it would discourage generators from carrying out assets additions thereby affecting the performance of the station.
- Further it is mentioned in the approach Paper that spares costing below Rs. 20 lakhs which may be in the nature of minor items such as tools and tackles, and those pertaining to Capital Spares may be allowed only as **part of O&M expenses** and may not be considered as part of additional Capitalization.

It is emphasized that as already generators are facing huge under recovery in O&M cost due to increase in employee remuneration and cost of spares, if capital spares hitherto allowed to be claimed separately by the Commission until now is



clubbed with O&M cost then it will aggravate further the under recovery of the Fixed costs.

- Hence the existing regulations for Additional Capitalization may be continued with more clauses on the nature and type of Supporting documents required for allowing Additional Capital expenditure.
- Currently common assets are not being allowed as part of Addl. Capital Expenditure and Commission intends to include the same under O&M. As these common assets are essential in nature, the same may be allowed in additional capitalisation, with separate provision. Alternatively, the normative O&M shall be sufficiently enhanced to include such expenditure towards common assets.

## 12. O&M Expenses

*O&M norms may be specified under the following two categories.*

*1. Employee Expenses*

*2. Other O&M Expenses comprise Repair and Maintenance and Administrative and General Expenses.*

*However, considering that systems that are more automated will require less manpower and systems that are less automated will require more manpower, approving separate norms, may result in inequity even though the total O&M expenses of such systems may be comparable.*

*Therefore, the above suggestion may also be seen from the perspective that these expenses have historically been allowed as one expense, and any change in the methodology as suggested above may result in unnecessary complications.*

*Alternatively, to give effect to the impact of pay/wage revision, 50% of the actual wage revision can be allowed on a normative basis.*

*Comments and suggestions are sought from stakeholders on above suggestions and alternatives, if any.*

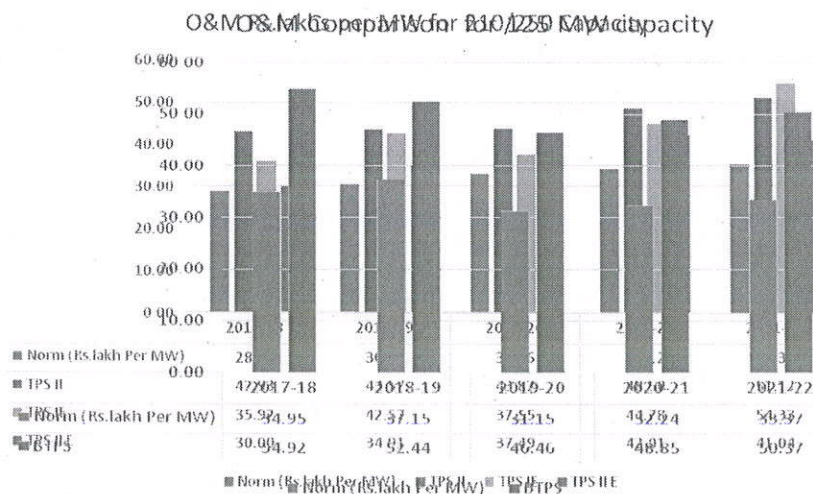
### NLCIL comments

- i. The average escalation considered in Tariff period 14-19 was 6.30% whereas average escalation considered in Tariff period 19-24 is @3.51%. The ageing of the Units and the increased maintenance requirements are also to be taken into consideration and added to that would be higher price of spares, than the cost when originally supplied with main equipment.
- ii. While allowing the O&M expenses escalation YoY basis, the ageing of the

station has to be taken into consideration. It is suggested that the O & M expenses to be made normative based on the category of the Station as mentioned below:

- CoD to 5 years
- 5 to 10 years
- 10 to 15 years
- 15 to 20 years
- 20 to 25 years
- More than 25 years

- The employee wages are being fixed based on the guidelines received from the DPE and the payment of DA raise is also inevitable. Hence, restricting the employee cost to a certain level is considered as not reasonable and requires a review.
- Service-related contracts are mainly dependent on manpower deployed and hence should be closely linked to the actual changes in labour rates, which may vary from one state to another.
- It would be prudent if Commission considers actual labour price increase. Therefore, RBI index for Labour prices must be used for computations of O&M cost. Therefore, CERC may consider the escalation of 6.30% or Use the RBI Labour Index for FY 2024-29 period.
- The actual O & M expenses of NLCIL plants are tabulated below:



- It is observed that actual O&M cost is higher than the prescribed norms for the years 2019-20 to 2021-22 for all the NLCIL Thermal Stations.
- Both lignite based BTPS & TPS IIE are based on CFBC Technology which is an environmentally friendly technology. Also, BTPS has completed almost Ten years

of operation, therefore, it is envisaged that the O&M cost will be higher for the subsequent years also.

- Hence, O&M expenses for **Lignite based power stations may be enhanced**, at least to the extent of actual incurrence, due to its uniqueness in operation and Maintenance involving more financial outlay. **Also, higher O&M expenses** may be considered for **CFBC boilers**, due to increased maintenance expenses and **increased down time period** required between shut down and startup as per **design specification**.

### 13. Depreciation

*The Commission, while formulating the CERC Tariff Regulations, 2009, specified a repayment period of 12 years to repay a normative loan corresponding to 70% of capital cost, and since then, the rate of depreciation has been specified based on this approach.*

*In view of the above, a depreciation rate may be specified considering a loan tenure of 15 years instead of the current practice of 12 years.*

#### NLCIL comments

- Existing methodology of depreciation may be continued with accelerated deprecation upto 12 years and thereafter in remaining useful life.
- Additional expenditure during fag end may be incurred for replacement of certain assets or newly added in order to maintain the production and there is no need for re-assessment of Life. Also as any additional expenditure is incurred only when it is essential it need not be restricted to limited items after R&M.
- As per the accounting Standard, there are two types of capitalization, one is new asset capitalization and other one is value addition to the existing asset.(other assets)
- In the case of new addition the depreciation is charged based on the life of that asset and in the case of value addition to the existing asset, it has to be depreciated within the life of the main asset.
- However, it is submitted that both the types of capital expenditure may be allowed to be depreciated over the balance useful life of the plant.

### 14. Interest on Loan

*To simplify the approval of interest on loans, the weighted average actual rate of interest of the generating company or transmission licensee may be considered*

*instead of project specific interest on loans. Further, the cost of hedging related to foreign loans be allowed on an actual basis, without allowing any actual FERV.*

**NLCIL comments**

- It is submitted that such normative debts may be considered as MCLR + 300 basis points (as on 1st April of respective financial year) instead of linking it to last available weighted average rate of interest of last available loan or the one applicable for the generating company as a whole.

**15. Return on Equity (RoE) Vs Return on Capital Employed (RoCE)**

*These are two different approaches that can be adopted to allow a return on investments made by generating companies or transmission licensees.*

*In brief, under the RoE method, return at a specified percentage is calculated based on market data and allowed on equity investments, whereas interest on debt is allowed on the basis of the actual interest rate. Under the RoCE approach, the return on total capital employed is allowed on the basis of the weighted average cost of capital (WACC), wherein the cost of debt and equity needs to be estimated for the computation of the WACC.*

*The Commission, however, due to following limitations and de-merits, up till now has decided in favour of RoE.*

**NLCIL comments**

- The equity in the investment is serviced by return. It is a source for accumulation of internal resource which is used for capital replacement/ additions. The grossing up provision is allowed to compensate the developer on account of tax liability.
- Existing methodology of ROE may be continued.
- 30% of Special allowance given may be considered for ROE purpose in order to incentivize older plants whose AFC is lower and are performing efficiently.

**16. Interest on Working Capital**

*Existing regulation for Coal/Lignite Based Stations*

- I. *Coal stock for 10 days for pit head stations, 20 days for non-pit head stations*
- II. *Cost of coal for 30 days generation*
- III. *Secondary fuel oil for 2 months*
- IV. *Maintenance spares @ 20% of O&M*
- V. *Receivables for 45 days (capacity charge and energy charge)*

VI. O&M expenses (including water charges and security expenses) for 1 month

Cost of fuel – based on Price & GCV of preceding 3 months of the 1st month for which tariff is decided and no fuel escalation allowed

Rate of interest will be bank rate as on 1.4.2014 or 1st of April of the year in which the station is declared under commercial operation

#### **NLCIL comments**

- The component of working capital decided as the receivables, interest rates, fuel cost etc are variable in nature and subject to vary with the Stations. It is impractical to set normative for working capital. Hence, the current Existing methodology may be continued

#### **17. Life of Generating Stations and Transmission System:**

*“the useful life of coal based thermal generating stations and transmission sub-stations may be increased to 35 years from the current specified useful life of 25 year”*

#### **NLCIL Comments:**

- As per the Regulation 17(2) of tariff regulation 2019, beneficiary has the first right of refusal for extension of the PPA incase of useful life (25years) of the Station gets over. With the current trend of higher RE penetration and the inclination for power procurement through open access, the tendency of the DISCOM to extend the PPA is declining. Hence, the recovery of fixed cost, like working capital, O&M expenses etc after the completion of useful life of the Station will not be possible if the useful life of the Generating Station extended to 35years. Therefore, for the existing Thermal Stations and ongoing projects, useful life shall be 25years only.

#### **18. Input Price of coal – Integrated Mine**

##### ***Annual Target Quantity:***

##### ***Current Regulation:***

- *Annual Target Quantity’ or ‘ATQ’ in respect of an integrated mine(s) means the quantity of coal or lignite to be extracted during a year from such integrated mine(s) as specified in the Mining Plan:*
- *Provided that in case the integrated mine(s) of coal or lignite is ready for supply of coal or lignite as per the Mining Plan but is prevented due to reasons not attributable to the generating company, the Commission may*

*relax the Annual Target Quantity up to a maximum of 15% of the quantity of coal or lignite to be extracted during a year as specified in the Mining Plan.*

**NLCIL Comments:**

- Mining Industry operation is risky and depends on vagaries of nature. There are geological surprises like washout (thinning out of lignite seam) in some area which are not captured during exploration as spacing of lignite exploratory boreholes are widely spaced resulting in unfavourable and higher stripping ratio than worked out in feasibility report.
- Performance of mines depends on various factors such as operational conditions, land availability, space constraints, blasting requirements and continuous water management.
- Also the Power surrendered by the linked Thermal Power Stations due to RE penetration are causing less demand of Lignite by the Thermal power plants has added further to its woes. Moreover Acquisition of land due to reasons not attributable to generating stations are further increasing stress in achieving targeted capacity of captive Mines
- Hence ATQ should be made 85% of the capacity by default instead of relaxation as per existing regulation.

**Capital Cost & Additional Capitalisation:**

**Current Regulation:**

- *For integrated mine(s), debt-equity ratio as on the date of commercial operation and as on the date of achieving Peak Rated Capacity shall be considered*
- *Provided that for integrated mine(s) in respect of lignite with the date of commercial operation prior to 1.4.2019, debt-equity ratio allowed by the Commission for the period ending 31.3.2019 shall form the basis for computation of input price.*
- *For integrated mine(s), debt-equity ratio for additional capital expenditure admitted by the Commission under these regulations shall be considered in the manner as specified under Clause (1) of this Regulation*

*Additional capital expenditure is allowed on the following grounds*

- I. After CoD and Upto Peak rated capacity*
- II. After Peak rated capacity*

Particulars	After CoD and Upto Peak rated Capacity	After peak rated Capacity
Towards Expenditure as per Mine Plan	Allowed	Allowed
Works Deferred for Execution and Undischarged liabilities	Allowed	Not Allowed
To Comply with directions or orders of any statutory authorities	Allowed	Allowed
To Comply with order or decree of any court of law or award of arbitration;	Allowed	Allowed
Procurement and development of land as per the Mining Plan;	Allowed	Allowed
Procurement of additional heavy earth moving machineries for replacement	Allowed	Not Allowed
Change in Law or Force Majeure events	Allowed	Allowed

#### **NLCIL Comments:**

- Current regulation is not allowing Additional Capitalisation towards procurement of Additional Heavy earth moving machineries (HEMM) and other equipments after attaining its peak rated capacity.
- Initial mining operations are normally commenced at shallow depths/favourable ratio to generate revenue at the earliest possible time. When the mine progresses, even after achieving PRC, some additional equipments like HEMM, conveyors, electric cable etc are required to operate mine at deeper depths/high stripping ratios.
- Unlike Thermal Stations, Capital addition shall be allowed throughout of life of mines.

#### **Annual Extraction Cost:**

- Existing regulation includes:
- **Depreciation**

*As per regulation 36H.od 2nd Amendment, Depreciation*

*(1) Depreciation in respect of integrated mine(s) shall be computed from the date of commercial operation by applying Straight Line Method:*

***“Provided that depreciation methodology allowed in respect of integrated mine(s) of lignite which have been declared under commercial operation on or before 31.3.2019, shall continue to apply for determination of input price of lignite.”***

As per above, NLCIL is permitted to continue the depreciation methodology as adopted before 31.03.2019 which is based on Companies Act 2013.

Presently details with respect to depreciation are being sought through **Form -11** where Generator has to provide the details of Assets and its

gross block(if GFA is allowed) /Net block (if NFA is allowed) for each year, depreciation rate and Deprecation amount. **Form-12** is prescribed for depreciation on average capital cost

There is contradiction in the both the formsthat asset wise depreciation is sought in **Form -11** and depreciation on average capital cost is sought in **Form-12**.

Hence in order to provide clarity, it is suggested that **Form 11** may be prescribed for computation of **Average rate of depreciation alone** based on Depreciation schedule as per Second Amendment in case of new mines or method adopted before 31.03.2019 in case of existing mines (i.e.Companies Act).The average rate of depreciation as per **Form -11**to be used in **Form-12** for Computation of depreciation on average capital cost for the purpose of Tariff.

➤ **Interest on Working Capital:**

- *Working capital requirement of Mines is estimated at Coal Stock for 7 days of Production, One month O&M expenses, Consumption of stores and spares including explosives, lubricants and fuel @ 15%/20% of O&M expenses for coal and lignite respectively.*
- *Rate of interest on working capital = 1year MCLR+350 basis points*

**NLCIL Comments:**

- As the Operating cycle for dues realisation in case of Linked Thermal Power station takes 45 days and all fixed expenses including statutory payments have to made on time irrespective of realisation and hence O&M expenses for 2 Months may be considered.
- Also the consumption of Stores and Spares will be higher in mines as compared to Thermals. Hence Consumption of stores and spares @30% of 2 Months O&M may be allowed

➤ **RoE& Interest on Loan :**

- ROE @14% and to be grossed up with effective Tax rate
- Interest on loan shall be arrived at by considering the weighted average rate of interest calculated on the basis of actual loan portfolio. If no actual loan last available weighted average rate to be taken

**NLCIL Comments:**

- Lignite Mines in Neyveli need to maintain water pressure beneath lignite seam. Ground water control and Storm water control are to be



maintained continually for smooth mining, otherwise mine would get flooded. These activities involve huge expenditures. Therefore, Generators with linked lignite Mines may be permitted to charge ROE as applicable to Power sector in pricing of Lignite.

- Regulations with respect to Interest on loan may be continued

➤ **Operation and Maintenance Expenses :**

- *For Coal, O&M expenses shall be allowed based on the projected O&M Expenses for each year of the tariff period subject to prudence check and True up based on actual Expenses by the Commission*
- *For Lignite, O&M in respect of the integrated mine(s) of lignite commissioned on or before 31st March 2019, shall be worked out based on the O&M expenses as admitted by the Commission during 2018-19 and escalated at the rate of 3.5% per annum;*

O&M expenses in respect of integrated mine commissioned after 31<sup>st</sup> March 2019 shall be allowed based on the projected O&M Expenses for each year of the tariff period subject to prudence check and True up based on actual Expenses by the Commission

**NLCIL Comments:**

- Being initial control period for Input price regulations, Commission has allowed O&M expenses for new mines (Both Coal and Lignite) commissioned after 31<sup>st</sup> Match 2019 based on projections and the same shall be subject to truing up.
- Whereas for Lignite Mines commissioned before 31st Match 2019 ,O&M to be escalated at 3.5% as normative based on O&M admitted for FY 2018-19
- It is submitted that normative O&M escalation to be increased to 6.35% keeping in view the RBI labor index as most of the O&M expenses comprise Employee Salaries, Contractor payments & Stores and Spares so as to reflect inflation trends
- Overburden removal expenses depends on many factors like unfavorable stripping ratio, Geological surprises and hard strata hence should be allowed separately on actual basis, similar to 2014-19 control period.

➤ **Mine Closure Expenses:**

- *Amount towards mine closure shall be deposited in the Escrow account as per the Mining Plan and shall be recovered as part of input price*

irrespective of the expenditure incurred towards mine closure during any of the years of the tariff period.

- The amount deposited in Escrow account and the interest received from Escrow account in a year shall be adjusted in the input price of coal or lignite of the respective year, as part of mine closure expenses, on case to case basis;

#### **NLCIL Comments:**

- Mine Closure Expenses as prescribed by Coal Controller of India (CCO) is deposited every year in the Escrow Account and is maintained as a short-term deposit for a period of one year and the said deposit is auto renewed with the Interest Accrued on the said deposit. Interest earned on the said deposit is not the income to Mine Owner. It is added to cumulative mine closure liability. Hence the interest accrued on the said deposits should not be adjusted from the mine closure cost.

#### **➤ Non tariff Income Adjustment:**

- **36P. Adjustment on account of Non-tariff income (NTI Adjustment):**
- Adjustment on account of non-tariff income (NTI Adjustment) for any year, such as income from sale of washery rejects in case of coal mine and profit, if any, from supply of coal to the Coal India Limited or merchant sale of coal as allowed under the Coal Mines (Special Provisions) Act, 2015 shall be worked out as under
- **$NTI\ Adjustment = (All\ Non-tariff\ income\ during\ the\ year)/(Actual\ quantity\ of\ coal\ or\ lignite\ extracted\ during\ the\ year)$**
- The above non-tariff income adjustment by way of credit note as
- **$NTI\ Adjustment\ in\ the\ year\ X\ Quantity\ of\ coal\ or\ lignite\ supplied\ in\ that\ year\ (To\ respective\ beneficiary)$**

#### **NLCIL Comments:**

- NLCIL mines are captive mines and taking into account the above clause, the entire profit on sale of lignite/coal is required to be passed on to the beneficiaries whereas the risk & expenditures for mining operation is entirely borne by mining company. During low demand period if miner is unable to achieve Annual Targeted Quantity(ATQ), then the full financial under recovery has to be borne by the miner.

- Further Section 7(5) The Mines and Minerals (Development and regulation) Amendment act, 2021 specifies the following,
 

***“Any lessee may, where coal or lignite is used for captive purpose, sell such coal or lignite up to fifty per cent. of the total coal or lignite produced in a year after meeting the requirement of the end use plant linked with the mine in such manner as may be prescribed by the Central Government and on payment of such additional amount as specified in the Sixth Schedule”***
- Hence, The Mines and Minerals (Development and Regulation) Amendment act, 2021 also allows the miner where coal or lignite is used for captive purpose to sell upto fifty per cent of the total coal or lignite produced in a year after meeting the requirement of the end use plant considering that the risk & expenditures for mining operations are completely borne by mining company
- Hence, the clause relating to Adjustment on account of non-tariff income (NTI Adjustment) may be amended considering the contradiction with **The Mines and Minerals (Development and Regulation) Amendment act, 2021** and the risk & expenditures for mining operations borne by the miners

#### 19. Sharing of Gains:

*Generator has to share the gain with beneficiaries on account of*

- i. *Efficiency based gain in plant performance (in 50:50 ratio with beneficiaries)*
- ii. *Refinancing and restructuring of loan (in 50:50 ratio with beneficiaries)*
- iii. *Non-tariff Income (in 50:50 ratio with beneficiaries)*
- iv. *CDM (Clean Development Mechanism) benefits: 100% of gross proceeds towards CDM benefits in the first year are to be retained by the developer, and from the second year onwards, 10% is to be shared with beneficiaries, and thereafter, every year 10% incremental benefits are to be shared, subject to a maximum of 50%.*

*Comments and suggestions are sought from the stakeholders on the following:*

- i. *Ways to increase non-core revenues through optimal utilization of available resources.*
- ii. *Any modification in the sharing mechanism that may be required*

#### **NLCIL Comments:**

- i. The efficiency based gain of the Generating Station is currently being shared with beneficiaries on monthly basis by adjusting in monthly power invoice raised. It is to mention that the performance of the Generating station is subject to vary depending on many factors including Station's annual maintenance schedule and

unanticipated forced outages thus operational norms will change month over month within a year.

In the current mechanism of gain sharing, if the demonstrated operational parameter is better than the normative level, the Generators are required to share the gain of operational parameter efficiency with the beneficiaries. However, if the monthly operational parameter deviates from its normative level, even due to essential annual maintenance or other uncontrollable factors, the loss due to deviation is to be borne by Generators alone.

A better mechanism can be, instead of sharing the gain on monthly performance of the Generating stations, it can be shared based on the **cumulative performance of the Station**, similar to current Compensation mechanism.

- ii. In PAT scheme implementation there is a possibility that a generation utility operating at performance levels (as approved by this Hon'ble Commission), takes up Improvement projects (of Capital nature) to meet such PAT targets and after implementation of such Capital projects may improve its operational norms as compared to earlier operating/normative levels, but fails to achieve the stringent targets set under PAT scheme by BEE due to uncontrollable factors beyond generating station's control. In short, after implementation of such Improvement Capital Projects, the actual operating levels of the generating station may end up somewhere between the earlier normative/operating levels and the stringent PAT scheme targets. As a result, the generating company will continue to share the gains (in approved ratio of 50:50) with the consumers as per the Regulation 70 due to improvement in actual operating levels as compared to earlier operating/normative levels, whereas on the other hand would have to bear the penalties by BEE for not meeting the PAT targets.

In view of the above, it is submitted that any gains for sharing under Regulation 70 shall be arrived at by netting off the losses (including penalties) incurred by the generating company under PAT scheme.

## **20. Treatment of arbitration award – Servicing of Principal and Interest Payment**

*To avoid such situations, the principal amount may be capitalised and the interest amount may be allowed to be recovered in installments from the beneficiaries. However, such a recovery of interest may also involve carrying cost.*

*Comments and suggestions are sought from stakeholders on the above approach and alternative ways, if any.*

**NLCIL Comments:**

The LD recovered by the Generators has already been adjusted in capital cost and the generator has also suffered by way of disallowance of part IDC. If the interest component of LD is not allowed to be capitalised, this would result in additional burden and under-recovery. Hence, both the principal and interest component are to be allowed for capitalisation.

**21. Treatment of interest on differential tariff after truing up:**

*"In order to streamline the rate of interest on the differential amount, the current practice of allowing a simple interest rate as per Regulation 10(7) in the 2024-29 tariff block may be continued. Further, interest may be allowed to be charged on the differential amount by the utility only until the issuance of the order, and no interest may be allowed during the recovery in six equal monthly instalments. Comments and suggestions are sought from stakeholders on the above approach and alternative ways, if any"*

**NLCIL Comments:**

The current proposal may be taken into the consideration.

**22. Normative Annual Plant Availability Factor (NAPAF)**

*"the existing norms of NAPAF may need review by considering past years' PAF, the procurement of coal from alternate sources, other than designated fuel supply agreements, changes in hydrology, etc"*

**NLCIL Comments:**

The norms governing NAPAF may be modified by considering the past performance of the individual plant rather than adopting uniform norms covering all the stations. Additionally, issue related to land acquisition is beyond the control of Generating Station and hence non-availability of station on account of shortage of fuel arising due to delay in land acquisition shall always be considered beyond the control of Generating Company. Thus relaxation in recovery of AFC, in case of fuel shortage arisen due land acquisition issues shall be considered by the Commission in upcoming Tariff Regulation.

**23. Peak and Off-Peak Tariff**

a) *Whether it would be advisable to limit the recovery based on daily peak and off-peak periods?*

**Current Regulation:**

*Currently 3 months in the financial year are declared as High Demand Season and remaining 9 months are declared as low demand season. Recovery of AFC is being*

done separately for these 2 seasons. Similarly within a day 4 hours are declared as peak hours and 20 hours are declared as off-peak hours. 20% of AFC accounted for day is being recovered from peak hours and remaining 80% of the AFC accounted for the day is being recovered through off-peak hours, with a provision to off-set the PAF over and above normative between peak and offpeak hours only. No adjustment of PAF above normative is allowed between the seasons.

**NLCIL Comment:**

The normative level of PAF for the Stations is fixed by the Commission incorporating shutdown non-availability to carry out necessary maintenance works which is essential for well-keeping of the machinery. As it is stated in the approach paper, postponement of annual maintenance plan to ensure higher availability of the Station during high demand season (HDS) can lead to unexpected shutdowns thus results the decreased availability during low demand season (LDS). Also, if the station has insured its availability at normative level during HDS but failed to reach the normative availability during LDS, with the current methodology of recovery of AFC, there will be net under-recovery of AFC for the year even when the high demand was fulfilled by the station.

Therefore, the current off-set of PAF over and above its normative level shall be done between seasons also or **the recovery of AFC shall be done based on Station's cumulative availability during peak and off peak hours of the year.** In this way a generating station will get same level of incentive for ensuring its availability throughout the year, **ensuring the recovery of AFC doesn't get affected by annual maintenance shutdown of the Stations.**

- b) *Suggestions on National versus Regional Peak as a reference point for recovery of fixed charges?*

**NLCIL Comment:**

As it is stated in the paper, being a diversified country, there cannot be any overlap in the peak demand requirement between the regions or the states. Demand patterns are localized and it will vary with sampling size of the geographical area.

**24. Operational Norms:**

*"It is observed that the Central Generating Stations that used to operate at around 80%-85% PLF prior to FY 2013-14 have now been operating at part load and much below the target PLF due to the need for higher RE integration,....*

*... as the generating stations are separately allowed degradation impact due to low load operations, it is felt that the norms may be fixed considering the ideal loading of*

*generating units. Comments and suggestions are sought from stakeholders on the above proposal and other key determinants to be considered while approving the norms”*

**NLCIL Comments:**

The average loading shall have an impact on the operating parameters, taking this into consideration the fixation on Operational Norm will be helpful only when the norms are set on-par with the actual degradation due to low load operation. Also, by considering relaxed norms based on the average loading of the station will further impact the energy charge of the station causing change in merit order position thus ultimately bringing the average loading of the Unit further down. Further, with the relaxed norm also, if the average loading reduces further down due to higher power backdown than considered, there should be a suitable compensation mechanism to take into the consideration of the losses incurred on account of degradation of Operational Parameters.

Therefore, it is suggested to review the current compensation mechanism to compensate Units having lower average loading than their norms rather than changing the operational norms itself.

*Comments and suggestions are sought from stakeholders on the option to do away with relaxed norms currently allowed on the basis of actual performance for various efficiency norms of generating stations.*

**NLCIL Comments:**

The inefficiency of a Station can be because of multiple reasons like technological changes/adaptation of new technology or age of the Units etc. Units trying to overcome the technical challenges faced can be with a promise to deliver better sustainable and environment friendly energy solutions on a long term. Doing away with any consideration of relaxation will lead to under-recovery of the capital invested as well as financial burden of loans taken. This will not only discourage the existing Station to continue their operation with huge under-recovery of capital cost but also challenges the future consideration of Investors in innovative tech. The proposal to eliminate any relaxation in operational norms of such Units can be evaluated on a case-by-case basis/ recommendation of CEA and existing units may be granted exemptions from it.

## 25. Operational Norms- Emission Control System:

Implementation of an emission control system also requires the determination of supplementary energy charges, which impacts the power plant's standing on merit order. The Commission, considering that most of the generating stations are yet to install these systems, ruled that these supplementary energy charges shall not be considered while preparing merit order. In view of the earlier approach and considering that most of these generating stations are still in the process of implementing such systems, the current practice of excluding such expenses while preparing merit order may be continued. As only very few of such emission control systems have been commissioned, and in the absence of sufficient data on actual operational performance and its impact on auxiliary consumption, the current tariff norms may be continued for the next control period. However, comments and suggestions are sought from stakeholders on the continuation of the existing norms, or is there a need to modify the same?

### Neyveli Comment:

Capital cost derived for installation of FGD based on Coal based power plants will not be directly applicable for Lignite based TPS. Also, the Project cost as awarded for 2 x 500MW NNTPS Units is Rs 914.89 Cr (excluding IDC, IEDC and PVC (20% as per contract awarded is applicable)). The total capital cost including IDC, IEDC and PVC of NNTPP shall be taken into consideration by CERC for the Capital investment for Lignite based TPS.

Additional information was filed before CERC under Clause 29 of Regn, 2019 for approval of Additional Capital on account of FGD for NNTPS Units on 01-04-2022 requesting for the following considerations as per below table:

Sl. No.	Description	NNTPP (2 X 500 MW)
1	Capital Cost (Rs. Cr.) for FGD (including GST).	914.89 Cr.
2	Normative Specific Limestone/ Reagent Consumption (Kg/kwhr) <sup>1</sup>	0.0479 Kg/Kwhr
3	Cost of Lime stone (Rs. / Kg) <sup>2</sup>	Rs. 4.06 /Kg
4	Auxiliary energy consumption in % <sup>3</sup>	2.15 %
5	Rate of Int on WC in %	11.25 %
6	Return on Equity in %	14.00 %
7	IDC & IEDC in %	10.00 %
8	O & M expenditure	2% of capital cost.



Hence, continuation of the existing norms is needs to be revisited as per specifications and especially impact of installation of FGD for the Lignite based separately by CERC.

Also, Shutdown for FGD installation as per Change in Law/Statutory obligation for any power plant shall be considered for deemed availability on a normative basis separately for lignite based TPS with 60days minimum for a Unit in the upcoming regulation. The same was put as a plea before CERC under Clause 79 of Regn(Powers to Relax), 2019 and may be converted as a normative under emission control norms.

## **26. Compensation for Part-Load Operations:**

*"It is observed that currently the impact is being allowed considering the norms or actuals, whichever is lower. This mechanism results in operational gains being passed on to the beneficiaries, while any losses are borne by the generator. The mechanism may need a review wherein either normative norms are followed, or compensation is limited to actual. It is further observed that there have been instances where the actual PLF of plants has been even below 55%. The current provisions for compensation do not cover operating PLF below 55%, and therefore, devising a compensation mechanism to govern such cases may also be required. Comments and suggestions are sought from stakeholders on the earlier norms and any changes that may be required to compensate the generators to operate the plants in a flexible manner to support the Grid."*

### **NLCIL Comments:**

Compensation for degradation of heat rate is governed by the 4<sup>th</sup> amendment of IEGC and detailed procedure formulated by NLCDC according to the CERC order issued on the same matter on 05-05-2017. The current mechanism allows generators to get compensated based on the differential charges between actual and normative and between degraded parameters based loading at DC and Schedule level.

#### **Case 1:**

$EC(DC)-EC(SC) < EC(Norm)-EC(Actual):$

In this case, the differential rate b/w degraded parameter is less than the differential rate b/w actual and normative, means the generator has incurred more degradation as anticipated. However, the current mechanism of compensation allows generator to get compensated on minimum of these 2 differential rate, thus  $EC(DC)-EC(SE)$  in this

case, hence defying the objective of compensating the generators for the caused degradation.

**Case 2:**

EC (DC)-EC (SC) > EC (Norm)-EC (Actual):

Here the differential rate b/w degraded parameter is more than the differential rate b/w actual and normative means the generator has incurred less degradation as anticipated. Here the allowed compensation is minimum of these two, that is EC (Norm)-EC(Actual). In this case the degradation due to lesser schedule generation is more however the better performance of the plant has limited the compensation to the actual performance.

From above two case, it can be gleaned that the better efficiency of the station resulted in the lesser compensation however the case when the station has actually incurred the loss due to deviation of operational norms, it was not compensated to the level as it supposed to be. Forming uniform method, either to take differential rate b/w actual and normative or differential rate b/w DC and SE loading can eliminate this issue.

Also, considering the compensation mechanism to extend below 55% of loading is essential for generating station of current proposal of flexible operation and to go below 55% of 100%MCR to meet the grid requirement.

However, it is to submit that the NLCIL's Lignite based power stations at Neyveli are operated with lignite fuel having low Calorific value and high moisture content. The boilers are designed to operate with 5 mills (excluding 1 at standby). Lignite being a low caloric fuel, any load fluctuation and low load operation, causes parameters to vary abruptly thus causing the mills to trip and making oil support essential to prevent the tripping of Unit. So necessarily lignite based PF stations have to operate with 5 mill conditions only i.e. 65% of the Unit load. Also, in CFBC boiler of TPS-II Expansion, the frequent ramping up and ramping down is not technically feasible, due to boiler inertia. Running at low load also create issue in FBHE fluidisation and variation in combustor differential pressure. Hence, running CFBC at lower load also is not technically feasible.

A detailed report with the difficulties faced by the NLCIL Units at Neyveli in running at lower load and high ramping rates was submitted to CEA. The copy of report submitted to CEA is enclosed. The same may be taken into consideration while drafting the 2024 regulation.

## 27. Blending of Coal:

*“Linking the consent of beneficiaries with the percentage blending of imported coal instead of an increase in ECR may enable a swift response to an increase in demand by the generating company. Procurement of such coal (other than linkage coal) has to be done through a transparent competitive bidding process. Comments and suggestions are sought from stakeholders on the above proposal and any other alternative, if any.”*

### **Current Regulation:**

With effect from directions issued by MoP vide letter dated 09.01.2023, wherein the domestic coal based generating stations can blend fuel upto 6% with alternate fuel source, until September 2023. Beyond Sep-23; energy charge rate based on weighted average price of fuel upon use of alternative source of fuel supply exceeds 30% of base energy charge rate as approved by the Commission for that year or exceeds 20% of energy charge rate for the previous month, whichever is lower shall be considered and in that event, prior consultation with beneficiary shall be made at least three days in advance

### **NLCIL Comments:**

Although the current regulation limits the blending of fuel with respect to energy charge escalation, consent of beneficiary is mandated only when the computed ECR goes beyond the limit of 20% from prev. month ECR or 30% of previous year ECR. Since, the majority of the Stations have more than one beneficiary, obtaining consent for blending from all beneficiaries when generators are facing a fuel shortage crisis can be a cumbersome process. This defeats the purpose of achieving quicker action against fuel shortage mitigation. Hence, the regulation of allowing blending of fuel upto certain limit without consent may be continued and consent may be obtained from beneficiaries only in case of further escalation of ECR.

It may also be noted that in certain cases, the sourcing of fuel may change depending on the Government allocation, as in the case of NTPL where Gol allotted Talabira Coal Mines of NLCIL for NTPL and NTTTP. However the same was questioned by beneficiaries stating that PPA doesn't allow sourcing from alternate source other than that mentioned in the agreement. In such scenario, the generators shall be allowed to source fuel from sources other than that has been specified in the Power Purchase agreement, without need for amendment in PPA.

**28. Incentives:**

*“Incentives linked to generation in excess of target PLF/NAPAF especially during peak periods, in the case of hydro stations and old pit-head generating stations, may need a review in order to encourage higher generation from such plants”*

**Current Regulation:**In addition to the capacity charge, an incentive is payable to a generating station or unit thereof @ 65 paise/ kWh for ex-bus scheduled energy during Peak Hours and @ 50 paise/ kWh for ex-bus scheduled energy during Off-Peak Hours corresponding to scheduled generation in excess of ex-bus energy corresponding to Normative Annual Plant Load Factor (NAPLF) achieved on a cumulative basis within each Season (High Demand Season or Low Demand Season). NAPLF is declared by the Commission based on Station's performance.

**NLCIL Comments:**

The current regulation incentivizes the Stations achieving PLF more than the normative, irrespective of its vintage. For station that has completed its useful life, the recovery of fixed cost is already minimal. With the current trend of higher RE penetration, the scheduling of the station will be reduced further. Hence, the current incentive for such stations can be levelized to a higher incentive, say 65 paise/kWhr, irrespective of peak and off peak period.

**NLC INDIA LIMITED  
NEYVELI  
FLEXIBLE OPERATION OF LIGNITE BASED THERMAL POWER GENERATING UNITS**

Submitted

Dt:- 15.05.2023

**Sub: Flexible Operation with Technical Minimum 40% Phasing plan - Reg**

**Ref: CEA (Thermal Projects Renovation & Modernization Division) Notification  
No.2/4/Flexible/TPRM/CEA/2022 dt 01.05.2023.**

**I. Introduction**

As per the CEA (Flexible Operation of Coal based Thermal Power generating Units) Regulation 2022 notified on 25.01.2023, the Coal fired generating units shall achieve minimum power level of 40 % according to the phasing plan specified by Authority from time to time.

The draft phasing plan was released wide notification under reference considering various factors such as Units design criteria, RE intensive state, Pithead units, Ball Tube mill, CFBC Boiler, Two-shift operation.

**II. Based on the above notifications, the following is submitted**

NLCIL - Phasing plan as per CEA			NLCIL Remarks
Station	Considered phase	Duration	
NNTPS	1	July,2024- Jun,2026	1. NNTPS and other NLCIL thermal power station are pit head stations unlike remarked in CEA phasing plan. 2. With low calorific value and high moisture lignite, running of the units below 65% technical minimum is not a safe operation. 3. Unlike coal power plants, NLCIL lignite power plants 40 % Technical Minimum is not sustainable.
TPS1E	3	July,2028- Dec,2029	
TPS2	4	Jan,2030- Dec,2030	

### 1) Previous proceedings:

A meeting was held on 16.02.2023 regarding issues faced during flexible operation (55%) of Lignite Based Thermal Power Plants under chairmanship of Chief Engineer (TPR&M), CEA. NLCIL deliberated its difficulties/issues faced while reducing load below 65%. **The minutes of meeting is enclosed herewith.** In the meeting, NLCIL and SLPP of GIPC was requested to submit issues/ challenges of low load operation in details to CEA/BHEL for study and requested BHEL to submit a report along with the way forward within one month.

In this regard documents were submitted to CEA/BHEL vide mail dated 20.02.2023.

### 2) Erratum observed in CEA phasing plan:

NNTPS and other NLCIL thermal power stations are listed as Non-pit head station in the Annexures enclosed by CEA phasing plan report.

NNTPS and other NLCIL thermal power stations **lignite source is NLCIL Mines – I, IA and Mines II. Hence all NLCIL TPS are PIT HEAD STATIONS.**

### 3) NLCIL - FLEXIBLE OPERATION OF ALL LIGNITE BASED THERMAL POWER GENERATING UNITS.

- a) For NLCIL Pulverized Lignite fired units are designed for Low calorific value fuel which draw uncontrolled flue gas from boiler and use the same for thermal disintegration of Lignite in the mill. This is a closed loop process where boiler loading affects mill availability and vice versa.
- b) Boilers are designed with corner firing with each mill outlet in the respective side of the boiler only. Hence load reduction below 65% of the rated load leads to unstable and unsafe operation with disturbances of fire ball and possible tripping of mills/units without oil support.
- c) The above conditions have been brought out in the CERC order dated 09 April 2019 on Petition No: 144/MP/2017 (based on CEA report) granting exemption to have these Pulverized Lignite fired NLCIL units of 210 MW and CFBC units of 250MW to operate at technical minimum of 65% of rated capacity.
- d) Accordingly Technical minimum of 65% was allowed for Thermal power station 1 Expansion, Thermal power station II & Thermal power station II expansion plants for reliable, safe and stable operation of the units on a sustained basis.
- e) NNTPS being a new unit and using lignite as a fuel, as there are no separate guidelines issued, the common technical minimum of 55 % applicable for coal based power station was insisted upon. As NNTPS was facing technical problems due to low calorific value lignite like heavy slagging and clinkers formation the low load operation creates flame instability in low load regions. Hence NNTPS has filed Amended Tariff Petition No- 219/GT/2019 before CERC praying for Technical Minimum of 65%.

**4) Difficulties faced in NLCIL PF boiler Power plants for low load operation is detailed below:**

- a) Considering the GCV and the moisture content, the design conditions of fuel for lignite based plants are inferior to that of coal based plants.
- b) In comparison to the boilers for indigenous coal which are designed for a typical GCV of 3800 kcal/kg with moisture content in the range 10-15%, the design calorific value of lignite on GCV basis is 2800 kcal/kg with moisture content varying from 48% to 52% for NLCIL Power Plants.
- c) Owing to lower calorific value of the fuel, more quantity of lignite should be increased / decreased to meet the Technical minimum/Ramp rate unlike coal fired boilers where the fuel variation is comparatively low due to higher Calorific value.
- d) Huge variation in lignite flow and associated variation in air flow at lower loads can create instability in tangential firing and disturbances in the fire ball.
- e) Low load operation of lignite fired boilers with reduced number of operating mills results in displacement of the fire ball and has implication of disturbance to stable operating conditions as compared to conventional coal fired boilers.
- f) Further, the combustion stability gets adversely affected at low load for lignite fired boilers due to very high moisture content present in the fuel. The issues get aggravated during monsoon season.
- g) Temperature of fuel/gas mixture at the classifier is to be maintained within 120 - 180 deg C. When the fuel flow is reduced for lower loads, the mill outlet temperature increases above 180oC due to uncontrolled flue gas extraction. In this case, the mill must be immediately stopped to avoid preignition of fuel in the mill before reaching the furnace.
- h) NLCIL made a control desk demonstration to CEA on 25/26 May 2018. Initially, the unit was operating near full load of about 207 MW with 5 mills in operation and the outlet temperature of the mills were in the range 154-164 deg C.
- i) Slowly the load was reduced to 135 MW with 4 mills in operation. Combustion was very poor and the flame scanners deteriorated with lowering of lignite flow and rise in mill outlet temperature in the range of 146-183 deg c. Furnace pressure fluctuations were observed.
- j) One more mill had to be taken out of service for further reduction of load. The same was not attempted as it may further deteriorate furnace stability. So with the concurrence of CEA observer for the safe operation of the unit further load reduction was stopped. It should also be noted that tripping of any mill at this condition would result in tripping of the unit.
- k) For further reduction of load, oil firing is required.

- l) Slagging of furnace walls is a typical phenomena and it is very high in NLCIL lignite fired boilers (figure 1). Slagging affects heat transfer, high exit flue gas temperature, poor boiler efficiency, over heating of coils, etc.
- m) For slag removal, Water lance operation unique for only Lignite Fired Boilers is very much required. At low loads, heavy fluctuations develop in the furnace if water lances are taken into service, leading to furnace instability (figure 2) as water quenches the fire ball and eventually resulting in tripping of the Unit.
- n) If technical minimum schedule is given for more time blocks, the water lances cannot be operated. This condition leads to heavy deposition of slag on the furnace walls as well as at the Mills Resuction Duct Mouth.
- o) Dislodging of this heavy mass of slag from furnace subsequently with lance operation results in falling of huge mass over the After Burning Grates and slag conveyor located below the furnace creating explosions in the Slag bath leading to major unsafe conditions.
- p) Hence operation of NLCIL lignite fired power plants at technical minimum less than 65% is highly unstable.

**5) Specific Technical problem pertaining to Lignite based Neyveli New Thermal Power Station (PF boiler) of 2X 500 MW - Restriction for technical minimum below 55%:**

- a) Five Mills need to be kept in service while operating the Unit at low loads, as four Mill operations will lead to Unit trip in the event of tripping of any one mill. Operating below 65% requires operation with 4 mills.
- b) At low load operation below 55% load, mill outlet temperature will be high which will lead to mill fire(pre combustion) and tripping of mill.
- c) Operating the Unit with 4 mills in service warrants fuel oil support, as otherwise, this will lead to tripping of Unit on any slight disturbance.
- d) This results in mixed firing for prolonged durations leading to formation of slagging on the furnace walls. Water lances also cannot be taken into service during low load conditions due to furnace pulsations. Further, shifting of fire ball in the furnace also occurs due to operation of less number of mills, leading to instability.
- e) Being once through boiler, operating at lower load reduces the Feed water flow through evaporator circuit rising the evaporator wall temperature in the particular side wall according to the mill combination leading to boiler trip on evaporator outlet temperature high.
- f) Once through boiler Dry to wet mode operation - Boiler will be unstable in transient load of operation between 40 to 48 % firing rate between dry and wet mode of operation. Boiler cannot be operated in this transient condition.



**6) Technical problem specific to Lignite based Thermal Power Station (PF boiler) of 210 MW- TPS 2 ( 7 X 210 MW ) TPS-I Expansion ( 2 X 210 MW)**

- a) Four Mills need to be kept in service while operating the Unit at low loads, as three Mill operations will lead to Unit trip in the event of tripping of any one mill.
- b) Orientation of mills in service is very important incase of 3 Mill operation to maintain the fire ball. ( Tangential corner firing)
- c) Stopping/starting of fourth mill can destabilize the system and can be done only with oil firing support.
- d) Operating the Unit with 3 mills in service is possible only with fuel oil support or otherwise, this will lead to tripping of the Unit even on any slight disturbance.

**7) Technical problem to Linked Pit head mines:**

As a result of lower utilization of lignite for power generation, utilization of linked mines capacity is getting affected, resulting in huge revenue loss.

**8) Conclusion:**

- NLCIL Lignite based power stations, Neyveli with PF boilers such as Neyveli New Thermal Power Station(NNTPS) of (2 X 500 MW) , TPS-I Expansion (2 X 210 MW) , and Thermal Power Station-II (7 X 210 MW) are Neyveli specific power stations operated with low Calorific value high moisture content Lignite.
- Other than Thermal power stations in Neyveli, no other Pulverized Lignite fired Boilers are present in India.
- The 500 MW NNTPS is exclusively available in NLCIL only. Difficulties are faced such as furnace slagging, clinkering, falling of clinkers etc which needs regular lance operation. At loads less than 65% of Technical minimum the lance operation is also difficult which operated will lead to furnace stability.
- The unit furnace instability (210 MW) while trying to reduce the load below 65% technical minimum has been demonstrated in presence of CEA during May 2018.

**Owing to the above reasons NLCIL Thermal power stations shall be excluded from Flexible Operation with Technical Minimum 40% Phasing plan and permitted to operate with a technical minimum of 65% for a safe and sustainable operations.**

Figure 1: Furnace Fouling Sketch

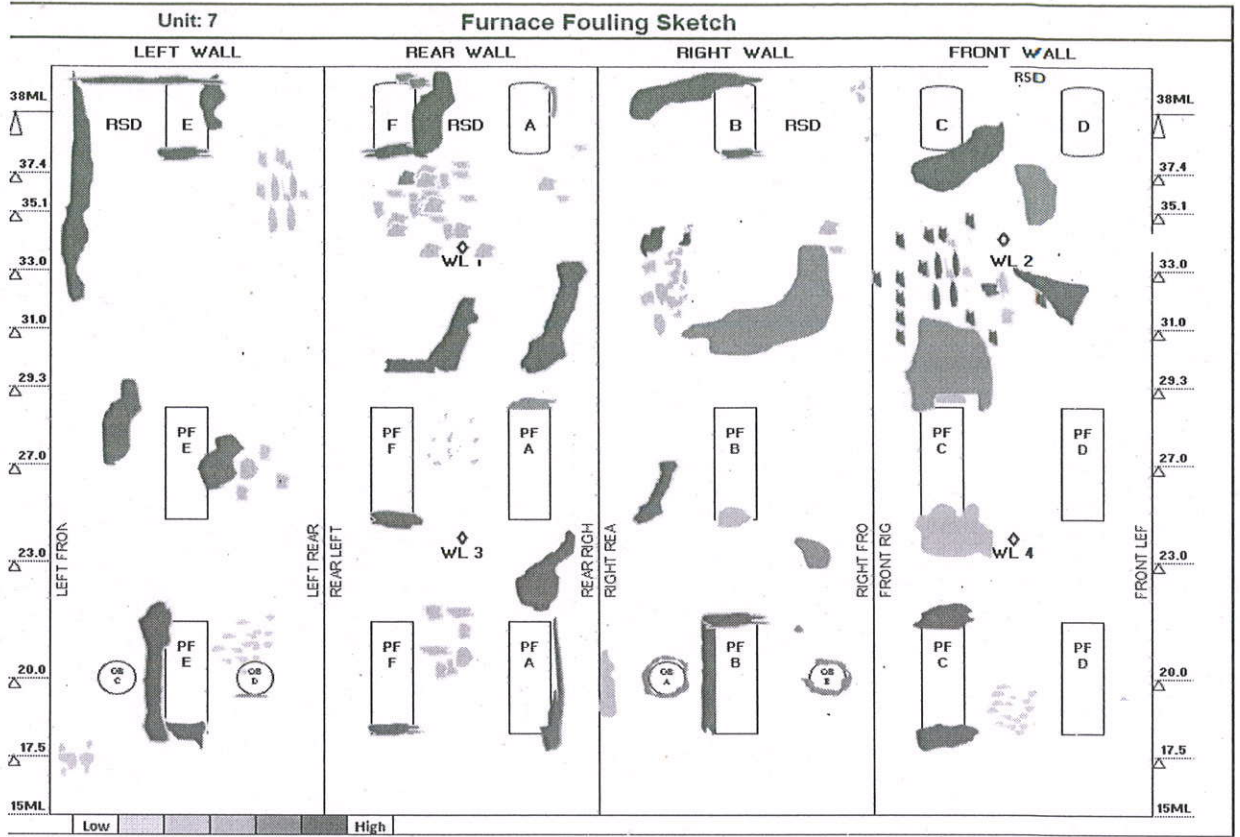


Figure 2: Furnace Fluctuation

