

**Central Electricity Regulatory Commission**  
**Core 3, 6<sup>th</sup> Floor, Scope Complex, New Delhi – 110 003.**  
(Tele No. 4364911 FAX No. 4360010)

No. L-7/25(1)/2001-CERC

New Delhi Dated: March, 26<sup>th</sup>, 2001.

**NOTIFICATION**

In exercise of powers conferred under Section 28 of the Electricity Regulatory Commissions Act, 1998, hereinafter referred to as the Act and all other powers enabling in this behalf, the Central Electricity Regulatory Commission, hereinafter referred to as the Commission, hereby prescribes through these Regulations the terms and conditions in accordance with which the tariff under clause (a), (b), and (c) of Section 13 of the Act shall be determined.

**CHAPTER 1**

**PRELIMINARY**

- 1.1 These Regulations shall be called the Central Electricity Regulatory Commission (Terms & Conditions of Tariff) Regulations, 2001.
- 1.2 These Regulations shall come into force w.e.f. 1-4-2001, and shall remain in force for a period of 3 years, unless reviewed earlier or extended by the Commission.
- 1.3 These Regulations shall apply where the capital cost-based tariff is determined by the Commission.
- 1.4 The generation tariff under these Regulations shall be determined station-wise and transmission tariff shall be determined line-wise, sub station-wise, as the case may be, and aggregated to regional tariff.

Provided that a utility may file a petition for fixation of tariff in respect of the completed units/systems.

- 1.5 In case of new projects, a utility shall submit the petition as per Appendix I to this notification, for determination of tariff at least 3 months in advance of the anticipated date of completion of project based on the project cost as approved by the Authority or an appropriate independent agency, other than the Board of Directors of the Generating Company, as the case may be.
- 1.6 For the purpose of tariff the capital cost of the project shall be broken up into stages and by distinct units forming part of the project. The common facilities

shall be apportioned on the basis of the installed capacity of the units and lines/sub Stations where break up of the project cost is not available and in case of on-going projects. All fresh petitions shall also be filed in the form as per Appendix I.

- 1.7 Recovery of Income Tax and Foreign Exchange Rate Variation shall be done directly by the utilities from the beneficiaries without filing a petition before the Commission. In case of any objections by the beneficiaries to the amounts claimed on these counts, they may file an appropriate petition before the Commission.
- 1.8 The core business as described in this notification refers to regulated activities of generation or transmission of electricity and does not include other business or activities of the regulated utility like consultancy, telecommunication, etc.
- 1.9 'Independent agency' means the agency approved by the Commission by a separate notification.
- 1.10 Tariff revisions during the tariff period on account of capital expenditure within the approved project cost incurred during the tariff period may be entertained by the Commission only if such expenditure exceeds 20% of the approved cost. In all cases, where such expenditure is less than 20%, tariff revision shall be considered in the next tariff period.
- 1.11 For removal of doubts, it is clarified that the norms prescribed herein are the ceiling norms only and this shall not preclude the Generating Company and other beneficiaries from agreeing to improved norms.
- 1.12 The norms prescribed under these Regulations shall not apply to the Generating Stations under the control of North East Electric Power Corporation.
- 1.13 **Extra Rupee Liability**
  - (a) Extra rupee liability towards interest payment and loan repayment actually incurred, in the relevant year shall be admissible; provided it directly arises out of foreign exchange rate variation and is not attributable to Utility or its suppliers or contractors. Every utility shall follow the method as per the Accounting Standard-11(Eleven) as issued by the Institute of Chartered Accountants of India to calculate the impact of exchange rate variation on loan repayment.
  - (b) Any foreign exchange rate variation to the extent of the dividend paid out on the permissible equity contributed in foreign currency, subject to the ceiling of permissible return shall be admissible. This as and when paid, may be spread over the twelve-month period in arrears.

#### **1.14 Tax Escrow Mechanism**

- (i) The beneficiaries shall maintain an interest bearing tax escrow account in a scheduled bank. All amounts of interest shall be credited to that account.
- (ii) The tax liability shall be estimated two months before the commencement of each year and intimated to the beneficiaries. The company shall endeavour to minimize its liability on account of taxes recoverable from SEBs/ beneficiaries.
- (iii) Central Sector Utilities (CSUs) shall be authorised to withdraw the amounts for settling the tax liability on presentation to the escrow holder of a certificate from the company's statutory auditors that such amounts are immediately due and payable to the taxing authority.
- (iv) The utilities shall pay into the tax escrow account any refund received from the taxing authority.
- (v) The refunds if any shall not be paid back to the beneficiaries and shall be adjusted in the escrow account. Any balance due or returnable shall be rolled over to the next year.
- (vi) The Escrow Accounts shall be reflected in the books of the beneficiaries as their bank account.

## CHAPTER 2

### THERMAL POWER GENERATING STATIONS

**2.1 DEFINITIONS-** Unless the context otherwise requires for the purpose of this chapter,

**'Plant Load Factor' or 'PLF'** - In relation to a given period, is expressed as the percentage of total kWh generated at generator terminals to Installed Capacity, expressed in kilowatts (kW) multiplied by number of hours in that period.

**'Authority'** means Central Electricity Authority constituted under Section 3 of the Electricity (Supply) Act 1948.

**'Auxiliary Energy Consumption' or 'AUX'** - In relation to any period, means the ratio, expressed as a percentage, of energy in kWh generated at Generator terminals minus energy in kWh delivered at the Generating Station Switchyard to gross energy in kWh generated at the Generator terminals.

**'Availability'**- Availability of thermal generating station for any period shall be the percentage ratio of average Sent Out Capability ( SOC ) for all the time blocks during that period and rated SOC of the generating station as per the following formula:

$$\text{Availability} = \left\{ \left( \sum_{i=1}^n \text{SOC}_i / (1 - \text{AUX}/100) \right) + \text{CL} \right\} \times 100 / h \times \text{I.C.}$$

where,

I.C. = Installed Capacity of the station in MW

$\text{SOC}_i$  = SOC of the  $i$ th time block of the period

$n$  = Number of time blocks during the period

AUX = Normative Auxiliary Energy Consumption as a percentage of gross generation.

$h$  = Number of hours during the period =  $n/4$

CL = Gross MWh of capacity of unit(s) kept closed on account of Generation scheduling order.

**'Block'** – In relation to Combined Cycle Generating Station includes Combustion turbine – generator(s), associated Waste Heat Recovery boiler(s), connected Steam Turbine – generator and auxiliaries.

**'Commercial Operation Date' or 'COD'** - In relation to a Unit means date by which the Maximum Continuous Rating (MCR) or Installed Capacity is demonstrated through a successful trial run. The COD of the Generating Station shall be reckoned from the COD of the last Unit or

in relation to a Unit or Block of a combined cycle generating station, the date of synchronization.

**'Declared Capacity' or 'DC'** - In relation to any period or time block, means the capability of the Generating Station to deliver ex-bus MWh declared by the generating company.

Explanation: The Declared Capacity shall not exceed the Installed Capacity.

**'Generating Station'** means Units and balance of plant and,

In relation to Combined Cycle Generating Station means Block(s) and balance of plant.

**'Gross Calorific Value' or 'GCV'** - The heat produced in kCal by complete combustion of one kg. of solid fuel or liquid fuel or one standard cubic meter of gaseous fuel, as the case may be.

**'Gross Station Heat Rate' or 'GHR'** - The heat energy in kCal input required to generate one kWh of electric energy at Generator terminals.

**'Installed Capacity'** - In relation to a Generating Station means Rated Capacity or the contracted capacity as the case may be.

**'Maximum Continuous Rating' or 'MCR'**- In relation to a Unit means the maximum continuous output at the generator terminals, guaranteed by the manufacturers at rated parameters and,

In relation to a Unit or Block of a combined cycle Generating Station means the maximum continuous output at the Generator(s) terminals, guaranteed by the manufacturer with Water/steam injection (if applicable) and corrected to 50 Hz grid frequency and site conditions.

**'Operation and Maintenance Expenses' or 'O&M Expenses'** - In relation to a period means the expenditure incurred in operation and maintenance of the generating station including manpower, spares, consumables, insurance and overheads.

**'Rated Capacity'** - In relation to the Generating Station means the Maximum Continuous Rating (MCR) of a Unit multiplied by number of Units in the Generating Station and ,

In relation to the Combined Cycle Generating Station means the Maximum Continuous Rating (MCR) of Block multiplied by the number of Blocks in the Generating Station.

**'Sent Out Capability'**- Sent Out Capability (SOC) of a Generating Station means the capability to deliver ex-bus MWh based on which 'availability' shall be worked out.

SOC for Thermal Stations shall be the DC, with all before-the-fact revisions/updating.

**Note 1:**

In case of gas turbine/combined cycle stations, the generator shall give DC for units/modules on gas fuel and DC for units/modules on liquid fuel separately, and the two shall be scheduled separately. Total DC and total SG for the station shall be the sum of the two.

**Note 2:**

For the gas turbine/combined cycle stations for any time block, the average frequency is below 49.52 Hz but not below 49.02 Hz and SG is more than 98.5% of DC, SG shall be deemed to have been reduced to 98.5% of DC and if the average frequency of the time block is below 49.02 Hz and SG is more than 96.5% of DC, SG shall be deemed to have been reduced to 96.5% DC.

'Unit' means Steam Generator - Turbine - Generator and their auxiliaries, or ,

In relation to Combined Cycle Generating Station, means Combustion Turbine-Generator and auxiliaries.

2.2 The tariff for sale of electricity from Thermal Generating Stations (including Gas and Naphtha based stations) shall comprise of two parts, namely, the recovery of annual Capacity (Fixed) Charges and Energy (Variable) Charges. The annual Capacity (Fixed) Charges shall consist of interest on loan capital, depreciation, return on equity, advance against depreciation, operation and maintenance expenses, and interest on working capital. The Energy (Variable) Charges shall cover fuel cost.

2.3 Notwithstanding anything contained in this notification,

- (a) the operational norms except those relating to "Target Availability" and "Plant Load Factor", as contained in the existing tariff notifications for individual power stations issued by the Central Government under proviso to Section 43 A(2) of the Electricity (Supply) Act, 1948 in respect of the existing stations of NTPC shall continue to apply for those stations.
- (b) The operational norms, except those relating to "Target Availability" and "Plant Load Factor" for the existing and the new stations of NTPC and NLC for which no tariff notification has been issued by the Central Government but Power Purchase Agreements (PPAs)/ Bulk Power Supply Agreements (BPSAs) exist on the date of issue of this notification, shall be governed by the respective PPAs / BPSAs signed by the Generating Company with the beneficiaries.
- (c) The Generating Company may approach the Commission for relaxation of "Target Availability" in exceptional circumstances with due justification. The Commission on being satisfied of the reasons and justification furnished by the Generating Company may grant such relaxation as may be considered appropriate.

Provided that no relaxation shall be granted without notice to the parties likely to be affected by such relaxation.

## 2.4 **Norms of Operation**

### **(i) Target Availability for recovery of full Capacity (Fixed) charges**

- (a) For all thermal Stations except those covered under clause (b) below - 80%
- (b) For NLC (TPS-II, Stage I&II) Stations - 72%

### **(ii) Plant Load Factor based on scheduled energy beyond which Incentive shall be payable**

- (a) For all Thermal Stations except those covered under clause (b) below - 77%
- (b) For NLC (TPS-II, Stage I&II) Stations - 72%

### **(iii) Gross Station Heat Rate for coal based stations**

- During stabilization period - 2600 K. Cal/kWh
- Subsequent period - 2500 K. Cal/kWh

In respect of 500 MW units where the boiler feed pumps are electrically operated, the heat rate of 40 K. Cal/kWh shall be reduced from Station Heat Rate.

In case of lignite fired power stations, the Gross Station Heat rates indicated above shall be corrected using multiplying factors as follows:

- (a) For lignite having 50% moisture: Multiplying factor of 1.10
- (b) For lignite having 40% moisture: Multiplying factor of 1.07
- (c) For lignite having 30% moisture: Multiplying factor of 1.04
- (d) For other values of moisture content, multiplying factor shall be pro-rated.

### **(iv) Gross Station Heat Rate for gas and Naphtha based stations**

- For open cycle - 2900 K. Cal/kWh
- For combined cycle - 2000 K. Cal/kWh

**(v) Secondary fuel oil consumption for coal based stations**

-During stabilization period	-	5 ml/kWh
-Subsequent period	-	3.5 ml/kWh

**(vi) Auxiliary Energy Consumption**

**With cooling tower**

**Without cooling tower**

**(a) Coal based stations**

200 MW series	9.5 per cent	9.0 per cent
500 MW series		
-Steam driven pumps	8.0 per cent	7.5 per cent
-Electrically driven pumps	9.5 per cent	9.0 per cent

**(b) Gas and Naphtha based stations**

Combined cycle	3.0 per cent
Open cycle	1.0 per cent

During the stabilization period, normative auxiliary consumption shall be reckoned at 0.5 per cent over and above the figures specified at (a) and (b) above.

**(vii) Date of Commercial Operation**

The date of commercial operation of individual units shall be reckoned as follows:-

Thermal (coal/lignite) Station: Not exceeding 180 days from the date of synchronization.

Gas and Naphtha based Station: From the date of synchronization.

**(viii) Stabilization period**

Stabilization period commencing from the date of commercial operation shall be reckoned as follows:

- (a) Thermal (coal/lignite) station - 180 days
- (b) Open cycle gas and Naphtha based station - 90 days
- (c) Combined cycle gas and Naphtha based station - 90 days



## **"Explanations:-**

1. For the purpose of calculating the tariff, the operating parameters, i.e. "Station Heat Rate", "Secondary Fuel Oil Consumption" and "Auxiliary Consumption" shall be determined on the basis of actuals or norms, whichever is lower.

### **2.5 Capital Expenditure**

The capital expenditure of the project shall be financed as per the approved financial package set out in the techno-economic clearance of the Authority or as approved by an appropriate independent agency as the case may be. The project cost shall include reasonable amount of capitalized initial spares.

The actual capital expenditure incurred on completion of the project shall form the basis for fixation of tariff. Where the actual expenditure exceeds the approved project cost, the excess expenditure as allowed by the Authority or an appropriate independent agency shall be considered for the purpose of fixation of tariff.

Provided that such excess expenditure is not attributable to the Generating Company or its suppliers or contractors;

Provided further that where a Power Purchase Agreement entered into between the Generating Company and the beneficiary provides a ceiling on capital expenditure, the capital expenditure shall not exceed such ceiling for computation of tariff.

### **2.6 Infirm Power**

In respect of infirm power, that is sale of electricity prior to commercial operation of the unit, any revenue from such sale (other than the fuel cost ), shall be taken as reduction in capital expenditure and not as net revenue.

### **2.7 Payment of Capacity (Fixed) Charges**

The Capacity Charges shall be computed on the following basis and its recovery shall be related to Availability.

#### **a) Interest on loan capital**

Interest on loan capital shall be computed on the outstanding loans, duly taking into account the schedule of repayment, as per the financial package approved by the Authority or an appropriate independent agency, as the case may be.

#### **b) Depreciation:**

- (i) The value base for the purpose of depreciation shall be the historical cost of the asset.

Depreciation shall be calculated annually as per straight line method at the rate of depreciation as prescribed in the Schedule attached to this notification as **Appendix-II**.

Provided that the total depreciation during the life of the project shall not exceed 90% of the approved original cost. The approved original cost shall include additional capitalization on account of foreign exchange rate variation also.

- (iii) Advance against depreciation (AAD), in addition to allowable depreciation, shall be permitted wherever originally scheduled loan repayment exceeds the depreciation allowable as per schedule and shall be computed as follows:

AAD = Originally scheduled loan repayment amount subject to a ceiling of 1/12<sup>th</sup> of original loan amount minus Depreciation as per schedule

- (iv) On repayment of entire loan, the remaining depreciable value shall be spread over the balance useful life of the asset.
- (v) Depreciation shall be chargeable from the first year of operation. In case of operation of the asset for part of the year, depreciation shall be charged on pro-rata basis.
- (vi) Depreciation against assets relating to environmental protection shall be allowed on case-to-case basis at the time of fixation of tariff subject to the condition that the environmental standards as prescribed have been complied with during the previous tariff period.

(c) **Return on Equity:**

Return on equity shall be computed on the paid up and subscribed capital and shall be 16 percent of such capital.

**Explanation:-**

Premium raised by the Generating Company while issuing share capital and investment or internal resources created out of free reserve of the existing utility, if any, for the funding of the project, shall also be reckoned as paid up capital for the purpose of computing the return on equity, provided such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station and forms part of the approved financial package as set out in the techno-economic clearance accorded by the Authority or approved by an appropriate independent agency, as the case may be.

(d) **Operation and Maintenance expenses including insurance**

- (i) Operation and Maintenance expenses including insurance (hereinafter referred to as O&M expenses) for the existing stations of NTPC and NLC which have been

in operation for 5 years or more in the base year of 1999-2000, shall be derived on the basis of actual O&M expenses, excluding abnormal O&M expenses, if any, for the years 1995-96 to 1999-2000 duly certified by the statutory auditors.

The average of actual O&M expenses for the years 1995-96 to 1999-2000 considered as O&M expenses for the year 1997-98 shall be escalated twice at the rate of 10 percent per annum to arrive at O&M expenses for the base year 1999-2000, as given below:

$$BO\&M2000_i = AVO\&M_i \times (1.10)^2$$

Where  $BO\&M2000_i$  = Base level O&M expenses for 1999-2000 for ith generating station

$AVO\&M_i$  = Average O&M expenses from 1995-96 to 1999-2000 for the ith generating station

The Base O&M expenses for the year 1999-2000 shall be further escalated at the rate of 6 percent per annum to arrive at permissible O&M expenses for the relevant year.

- (ii) In the case of new thermal stations of NTPC and NLC which have not been in existence for a period of five years, the Base O&M expenses shall be fixed at 2.5 percent of the actual capital cost as approved by the Authority or an appropriate Independent agency, as the case may be, in the year of commissioning and shall be escalated at the rate of 10 percent per annum for subsequent years to arrive at O&M expenses for the base year 1999-2000 level. Thereafter the Base O&M expenses shall be further escalated at the rate of 6 percent per annum to arrive at permissible O&M expenses for the relevant year.
- (iii) For plants commissioned during the tariff period (2001-02 to 2003-04), the Base O&M expenses shall be fixed at 2.5 percent of actual capital cost as approved by the Authority or an appropriate Independent agency, as the case may be, in the year of commissioning and shall be subject to an annual escalation of 6 per cent per annum from the subsequent year.
- (iv) The escalation factor of 6 percent per annum shall be used to revise the base figure of O&M expenses. A deviation of the escalation factor computed from the actual inflation data that lies within 20 percent of the above notified escalation factor of 6 percent (which works out to be 1.2 percentage points on either side of 6 percent) shall be absorbed by the utilities/beneficiaries. In other words if the escalation factor computed from the observed data lies in the range of 4.8 to 7.2 percent, this variation should be absorbed by the utilities. Any deviations beyond this limit shall be adjusted on the basis of the actual escalation factor arrived at by applying a weighted price index of CPI for industrial workers (CPI\_IW) and an index of select components of WPI (WPIOM) as per formula given in note below clause (v) herein below, for which the utility shall approach the Commission with a petition.

- (v) The escalation of yearly expenses from the published data for the tariff period shall be computed as follows:

$$0.4 \times \text{INFL}_{\text{CPI}} + 0.6 \times \text{INFL}_{\text{WPIOM}}$$

where:

$\text{INFL}_{\text{CPI}}$  = Annual Average Inflation in CPI\_IW

$\text{INFL}_{\text{WPIOM}}$  = Annual Average Inflation in WPIOM

Where as CPI\_IW is directly published by the Government, WPIOM shall be computed from disaggregated data on wholesale prices published by Ministry of Industry.

### Note

The special index of wholesale prices for power generating utilities (WPIOM) may be obtained as a weighted average of relevant components selected from disaggregated WPI series (1993-94=100) as given below:

<b>COMMODITIES</b>	<b>WEIGHTS</b>
1. Lubricants	0.16367
2. Cotton Cloth	0.90306
3. Jute, Hemp and Mesta Cloth	0.37551
4. Paper & Paper Products	2.04403
5. Rubber & Plastic Products	2.38819
6. Basic Heavy Inorganic Chemical	1.44608
7. Basic Heavy Organic Chemical	0.45456
8. Paints Varnishes & Lacquers	0.49576
9. Turpentine, Synthetic Resins, Plastic materials etc	0.74628
10. Matches Explosives & Other Chemicals	0.94010
11. Non-Metallic Mineral Products	2.51591
12. Basic Metals Alloys & Metals Products	8.34186
13. Machinery & Machine Tools	8.36331
14. Transport Equipment & Parts	4.29475
<b>All the Above (WPIOM)</b>	<b>33.47307</b>

$$WPIOM = \frac{\sum_{i=1}^{14} wiWPIi}{\sum_{i=1}^{14} wi}$$
 where  $WPIi$  is the wholesale price index of the  $i$ th commodity and  $wi$  is the respective weight

**Note**

The data used for computing the permissible O&M expenses shall be certified by the statutory auditors,

(e) **Interest on Working Capital**

Interest on Working Capital shall cover:

- (i) Fuel cost for one month and reasonable fuel stocks as actually maintained but limited to fifteen days for pit head stations and thirty days for non pit-head stations, corresponding to the "Target Availability"
- (ii) sixty days stock of secondary fuel oil, corresponding to the "Target Availability"
- (iii) Operation and Maintenance expenses (cash) for one month;
- (iv) maintenance spares at actuals subject to a maximum of one per cent of the capital cost but not exceeding one year's requirements less value of one fifth of initial spares already capitalized for first five years;
- (v) receivables equivalent to two months' average billing for sale of electricity calculated on "Target Availability"; and
- (vi) The interest rate for this purpose shall be the cash-credit rates prevailing at the time of tariff filing.

2.8 Full Fixed Charges shall be recoverable at "Target Availability" specified in clause 2.4(i). Recovery of Capacity (Fixed) Charges below the level of Target Availability shall be on pro-rata basis. At zero availability, no Capacity Charge shall be payable.

2.9 The payment of Capacity Charges shall be on monthly basis in Rs/kW/Month in proportion to the allocated capacity.

## 2.10 Energy Charges

### (i) For stations covered under ABT

Energy (variable) Charges shall cover fuel costs and shall be worked out on the basis of paise per kWh on ex-bus energy scheduled to be sent out from the generating station as per the following formula:

$$\text{Energy Charges} = \text{Rate of Energy Charges} \times \text{Scheduled Generation (ex-bus)}$$

### (ii) For stations other than those covered under ABT

Energy (variable) charges shall cover fuel costs and shall be worked out on the basis of paise per kWh on ex-bus energy delivered / sent out from the generating station as per the following formula:

$$\text{Energy Charges} = \text{Rate of Energy Charges} \times \text{Energy delivered (ex-bus)}$$

Where,

**Rate of Energy Charges (REC)** shall be the sum of the cost of normative quantities of primary and secondary fuel for delivering ex-bus one kWh of electricity and shall be computed as under:

$$\text{REC} = \frac{P_p \times (Q_p)_n + P_s \times (Q_s)_n}{(1 - (\text{AUX}))}$$

Where,

$P_p$  = Price of primary fuel namely coal or Lignite or Gas or Naphtha in Rs/Kg

$(Q_p)_n$  = Quantity of primary fuel required for generation of one kWh of electricity at generator terminals in Kg, and shall be computed on the basis of Gross Station Heat Rate (less heat contributed by secondary fuel oil for coal/lignite based stations) and gross calorific value of coal/lignite or gas or Naphtha actually fired.

$P_s$  = Price of Secondary fuel oil in Rs./ml,

$(Q_s)_n$  = Quantity of Secondary fuel oil as per clause 2.4 (v),

$(\text{AUX})$  = Auxiliary Energy Consumption as per clause 2.4 (vi) ,as the case may be.

## **Adjustment on account of variation in price or heat value of fuels**

Initially Gross Calorific Value of coal/lignite or gas or naphtha shall be taken as per actual in the preceding three months. Any variation shall be adjusted on a month to month basis on the basis of Gross Calorific Value of coal/lignite or gas or naphtha actually received and burnt and actual landed cost incurred by the Generating Company for procurement of coal/lignite, oil, or gas or Naphtha as the case may be. No separate petition need to be filed with the Commission for fuel price adjustment. In case of any disputes an appropriate petition in accordance with CERC (Conduct of Business Regulations) 1999 shall be filed before the Commission.

### **2.11 Incentive**

- (i) An incentive shall be allowed to be recovered @ 50% of the fixed cost/kWh at normative PLF for generation between normative PLF and up to 90% PLF, subject to a ceiling of 21.5 paise/kWh.
- (ii) For generation beyond 90% PLF, incentive shall be allowed to be recovered @ 50% of the incentive payable under the preceding clause.

### **2.12 Tax on income**

Tax on income from core-activity of the Generating Company, if any, is to be computed as an expense and shall be recoverable by the Generating Company from the beneficiaries.

Any under or over recoveries of tax shall be adjusted every year on the basis of certificate of statutory auditors.

Provided that:

- i) Tax on any income streams other than income from core-activity, if any, accruing to the Generating Company shall not constitute as a pass through component in the tariff. Tax on such other income shall be payable by the Generating Company.
- ii) The station-wise profit before tax as estimated for a year in advance shall constitute the basis for distribution of the Corporate tax liability to all the stations.
- iii) The benefit of Tax Holiday where applicable as per the provisions of the Income Tax Act, 1961 shall be passed on to the respective stations.
- iv) The credit for carry forward losses, if any, shall be given in an equitable manner for all stations.

- v) The tax allocated to stations shall be charged to the beneficiaries in the same proportion as annual fixed charges.

### 2.13 **Development Surcharge**

The Generating Company shall be entitled to a Development Surcharge of 5% on every bill for Fixed Charges raised by it in respect of generation at regional level. The Development Surcharge shall not be payable for plants operating exclusively within a State. The levy of Development Surcharge shall be subject to the following conditions:

- (a) Surcharge collected by the utilities shall be kept in a separate bank account and may be invested in securities of recognised infrastructure funds like IDFC or IDBI Tax free bonds and income therefrom shall also be credited to that bank account;
- (b) The Generating Company shall maintain separate accounts in its books and reflect the balance in the Development Surcharge Reserve Account and the investment represented against the same in the balance sheet;
- (c) On the purchase of the undertaking or on any other such contingency the reserve and the corresponding investments shall be transferred to the successor undertaking to subserve the same objective of fresh capacity addition;
- (d) The fund can be made use of to the extent of 1/3<sup>rd</sup> of the equity requirement for any capacity addition in the respective region and the balance 2/3<sup>rd</sup> being provided by the Generating Company;
- (e) To the extent to which the fund is used as equity in any new capacity addition, pro rata reduction for the return on equity in the determination of tariff of the new project shall be allowed;
- (f) A certificate in the prescribed form regarding the use of these funds shall be filed with the Commission every year, duly verified by the statutory auditors of the Generating Company;
- (g) The use of these funds in any other manner shall be only with the prior approval of the Commission either on petition or suo motto for which the due process as per the CERC (Conduct of Business) Regulations shall be followed.

### 2.14 **Unschedule Interchange(UI) Charges applicable to stations covered under ABT**

Variation in actual generation/drawal and scheduled generation/drawal shall be accounted for through Unscheduled Interchange (UI)Charges. UI for Generating Station shall be equal to its actual generation minus its scheduled generation. UI for beneficiary shall be equal to its total actual drawal minus its total scheduled drawal. UI shall be



worked out for each 15 minute time block. Charges for all UI transactions shall be based on average frequency of the time block and the following rates shall apply:

<b>Average Frequency of time block</b>	<b>UI Rate (Paise per kWh)</b>
50.5 Hz and above	0.00
Below 50.5 Hz and up to 50.48 Hz	5.60
Below 49.04 Hz and up to 49.02 Hz	414.40
Below 49.02 Hz	420.00
Between 50.5 Hz and 49.02 Hz	linear in 0.02 Hz step

(Each 0.02 Hz step is equivalent to 5.6 paise /kWh within the above range)

The above average frequency range and UI rates are subject to change through a separate notification from time to time.

The provisions relating to UI shall come into force in accordance with the following time schedule, after implementation of ABT.

Southern Region	:	01-04-2001
Eastern Region	:	01-05-2001
Northern Region	:	01-06-2001
Western Region	:	01-08-2001

#### 2.15. **Rebate**

For payment of bills through letter of credit, a rebate of 2.5 per cent shall be allowed. If the payments are made by a mode other than through letter of credit but within a period of one month of presentation of bills by the Generating Company, a rebate of 1 per cent shall be allowed.

#### 2.16 **Late Payment Surcharge**

In case the payment of bills by the beneficiary (ies) is delayed beyond a period of 1 month from the date of billing a late payment surcharge at the rate of 1.5 percent per month shall be levied by the Generating Company.

#### 2.17 **Scheduling:**

(This shall be read with Chapter 7 of IEGC regarding procedure for scheduling).

Methodology of Scheduling and Calculating Availability shall be as under:

- (i) Each day starting from 00.00 hrs. shall be divided into 96 time blocks of 15 minutes intervals.

- (ii) The generator shall make an advance declaration of capability of its generating station. The declaration shall be for that capability which can be actually made available.

The declaration shall be for the capability of the Generating Station to deliver ex-bus MWh for each time block of the day. The capability as declared by generator, referred to as DC, would form the basis of generation scheduling.

- (iii) While making or revising their declaration of capability, the generator shall ensure that its declared capability during peak hours is not less than that during other hours. However, exception to this rule shall be allowed in case of tripping/re-synchronisation of units as a result of forced outage of units.
- (iv) The generation scheduling shall be done in accordance with the operating procedure, as stipulated in the IEGC.
- (v) Based on the declaration of the generator, RLDC shall communicate their shares to the beneficiaries out of which they shall give their requisitions.
- (vi) Based on the requisitions given by the beneficiaries and taking into account technical limitations on varying the generation and also taking into account transmission system constraints, if any, RLDC shall prepare the economically optimal generation schedules and drawal schedules and communicate the same to the generator and the beneficiaries.

RLDC shall also formulate the procedure for meeting contingencies both in the long run and in the short run (Daily scheduling).

- (vii) The scheduled generation and actual generation shall be at the generator's ex-bus. For beneficiaries, the scheduled and actual net drawals shall be at their respective receiving points.
- (viii) For calculating the net drawal schedules of beneficiaries, the transmission losses shall be apportioned to their drawals.
- (ix) Scheduled generation of the generating station for each time block, referred to as SG shall mean the Scheduled MWh to be Sent Out Ex-bus from the Generating Station.
- (x) Actual generation of the station for each time block, referred to as AG, shall mean actual MWh actually Sent Out Ex-bus from the generating station.
- (xi) In case of forced outage of a unit, RLDC shall revise the schedules on the basis of revised declared capability. The revised schedules shall become effective from the 4th time block, counting the time block in which the revision is advised by the

generator to be the first one. The revised declared capability shall also become effective from the 4th time block.

- (xii) In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and substations owned by CTU (as certified by RLDC) necessitating reduction in generation, RLDC shall revise the schedules which shall become effective from the 4th time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the station shall be deemed to have been revised to be equal to actual generation and also the scheduled drawals of the beneficiaries shall be deemed to have been revised to be equal to their actual drawals.
- (xiii) In case of any grid disturbance, scheduled generation of all the Generating Stations and scheduled drawal of all the beneficiaries shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by RLDC.
- (xiv) Revision of declared capability by the generator(s) and requisition by beneficiary(ies) for the remaining period of the day shall also be permitted with advance notice. Revised schedules/declared capability in such cases shall become effective from the 6th time block, counting the time block in which the request for revision has been received in RLDC to be the first one.
- (xv) If, at any point of time, RLDC observes that there is need for revision of the schedules in the interest of better system operation, it may do so on its own and in such cases, the revised schedules shall become effective from the 4th time block, counting the time block in which the revised schedule is issued by RLDC to be the first one.
- (xvi) Generation schedules and drawal schedules issued/revised by RLDC shall become effective from designated time block irrespective of communication success.
- (xvii) For any revision of scheduled generation, including post facto deemed revision, there shall be a corresponding revision of scheduled drawals of the beneficiaries.
- (xviii) A procedure for recording the communication regarding changes to schedules duly taking into account the time factor shall be evolved by CTU.

## 2.18 **Demonstration of Declared Capability**

The Generating Company may be required to demonstrate the declared capability of its Generating Station as and when asked by the RLDC of the region in which the Generating Station is situated. In the event of generator failing to demonstrate the declared capability, the capacity charges due to the generator shall be reduced as a

measure of penalty. The quantum of penalty for the first mis-declaration for any duration/block in a day shall be the charges corresponding to two days Fixed Charges. For the second mis-declaration the penalty shall be equivalent to Fixed Charges for four days and for subsequent mis-declarations, the penalty shall be multiplied in the geometrical progression as per the order of the Commission.

**Note:**

In case it is observed that the declaration of its capability by the generator is on lower side and the actual generation is more than DC, then UI charges due to the generator on account of such extra generation shall be reduced to zero and the amount shall be credited towards UI account of beneficiaries in the ratio of their capacity share in the station.

**2.19 Metering and Accounting**

Metering arrangements, including installation, testing and operation and maintenance of meters and collection, transportation and processing of data required for accounting of energy exchanges and average frequency on 15 minute time block basis shall be provided by the POWERGRID/RLDCs. Processed data of the meters along with data relating to declared capability and schedules etc., shall be supplied by RLDCs to REBs and REBs shall issue the Regional Accounts for energy as well as UI charges on monthly basis. The UI accounting procedures shall be governed by the orders of the Commission.

**2.20 Billing and Payment of Capacity Charges**

Billing and Payment of Capacity Charges shall be done on a monthly basis in the following manner:

- (i) Each beneficiary shall pay the Capacity Charges in proportion to its percentage share in total saleable capacity of the station. Saleable capacity shall mean total capacity minus free capacity to Home State(s), if any.

**Note I**

Allocation of total capacity of Central Sector Stations is made by Central Government from time to time which also has an unallocated portion. Allocation of the unallocated portion shall be made by the Central Government from time to time, for the total unallocated capacity. The total capacity share of any beneficiaries would be sum of its capacity share plus allocation out of the unallocated portion. In case of no specific distribution of unallocated power by the Central Government, the unallocated power shall be added to the allocated shares in the same proportion as the allocated shares.

## Note 2

- The beneficiaries may propose surrendering part of their allocated share to other States within/outside the region. In such cases, depending upon the technical feasibility of power transfer and specific agreements reached by the generating company with other States within/outside the region for such transfers, the shares of beneficiaries may be re-allocated by the Central Generating for a specific period. When such re-allocations are made, the beneficiaries who surrender the share shall not be liable to pay capacity charges for the surrendered share. The capacity charges for the capacity surrendered and reallocated as above shall be paid by the State(s) to whom the surrendered capacity is allocated. Except for the period of reallocation of capacity as above, the beneficiaries of the generating station shall continue to pay the full fixed charges as per allocated capacity shares.
- (ii) The beneficiaries shall have full freedom for negotiating any transaction for utilisation of their capacity shares. In such cases, the beneficiary having allocation in the capacity of the generating station shall be liable for full payment of Capacity Charges and Energy Charges (including that for sale of power under the transactions negotiated by them) for all its scheduled and unscheduled transactions from its capacity share.
  - (iii) If there is any capacity which remains un-requisitioned during day-to-day operation, RLDC shall advise all beneficiaries in the region and the other RLDCs so that such capacity may be requisitioned through bilateral arrangements with the concerned generating company/beneficiary(ies) under intimation to the RLDC.
  - (iv) The Capacity Charges shall be paid by the beneficiary(ies) including those outside the Region to the generator every month in accordance with the following formula:

Total Capacity Charges payable to the generator for the:

- 1<sup>st</sup> month =  $(1 \times \text{ACC1})/12$
- 2<sup>nd</sup> month =  $(2 \times \text{ACC2} - 1 \times \text{ACC1})/12$
- 3<sup>rd</sup> month =  $(3 \times \text{ACC3} - 2 \times \text{ACC2})/12$
- 4<sup>th</sup> month =  $(4 \times \text{ACC4} - 3 \times \text{ACC3})/12$
- 5<sup>th</sup> month =  $(5 \times \text{ACC5} - 4 \times \text{ACC4})/12$
- 6<sup>th</sup> month =  $(6 \times \text{ACC5} - 5 \times \text{ACC5})/12$
- 7<sup>th</sup> month =  $(7 \times \text{ACC7} - 6 \times \text{ACC6})/12$
- 8<sup>th</sup> month =  $(8 \times \text{ACC8} - 7 \times \text{ACC7})/12$
- 9<sup>th</sup> month =  $(9 \times \text{ACC9} - 8 \times \text{ACC8})/12$
- 10<sup>th</sup> month =  $(10 \times \text{ACC10} - 9 \times \text{ACC9})/12$
- 11<sup>th</sup> month =  $(11 \times \text{ACC11} - 10 \times \text{ACC10})/12$
- 12<sup>th</sup> month =  $(12 \times \text{ACC12} - 11 \times \text{ACC11})/12$

and, Each beneficiary having firm allocation in capacity of the generating station shall pay for the :

$$\begin{aligned}1^{\text{st}} \text{ month} &= [ \text{ACC1} \times \text{WB1} ]/1200 \\2^{\text{nd}} \text{ month} &= [2\text{XACC2} \times \text{WB2} - 1\text{XACC1} \times \text{WB1}]/1200 \\3^{\text{rd}} \text{ month} &= (3\text{XACC3} \times \text{WB3} - 2\text{XACC2} \times \text{WB2})/1200 \\4^{\text{th}} \text{ month} &= (4\text{XACC4} \times \text{WB4} - 3\text{XACC3} \times \text{WB3})/1200 \\5^{\text{th}} \text{ month} &= (5\text{XACC5} \times \text{WB5} - 4\text{XACC4} \times \text{WB4})/1200 \\6^{\text{th}} \text{ month} &= (6\text{XACC5} \times \text{WB6} - 5\text{XACC5} \times \text{WB5})/1200 \\7^{\text{th}} \text{ month} &= (7\text{XACC7} \times \text{WB7} - 6\text{XACC6} \times \text{WB6})/1200 \\8^{\text{th}} \text{ month} &= (8\text{XACC8} \times \text{WB8} - 7\text{XACC7} \times \text{WB7})/1200 \\9^{\text{th}} \text{ month} &= (9\text{XACC9} \times \text{WB9} - 8\text{XACC8} \times \text{WB8})/1200 \\10^{\text{th}} \text{ month} &= (10\text{XACC10} \times \text{WB10} - 9\text{XACC9} \times \text{WB9})/1200 \\11^{\text{th}} \text{ month} &= (11\text{XACC11} \times \text{WB11} - 10\text{XACC10} \times \text{WB10})/1200 \\12^{\text{th}} \text{ month} &= (12\text{XACC12} \times \text{WB12} - 11\text{XACC11} \times \text{WB11})/1200\end{aligned}$$

Where,

ACC1, ACC2, ACC3, ACC4, ACC5, ACC6, ACC7, ACC8, ACC9, ACC10, ACC11 and ACC12 are the amount of Annual Capacity Charge corresponding to 'Availability' for the cumulative period up to the end of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> months respectively.

And, WB1, WB2, WB3, WB4, WB5, WB6, WB7, WB8, WB9, WB10, WB11 and WB12 are the weighted average of percentage allocated capacity share of the beneficiary during the cumulative period up to 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> month respectively.

And,

Year means the financial year.

When the month of changeover to tariff as per this notification is not the first month of a financial year, then 'Availability' for the part of the year prior to switchover shall be "deemed PLF" determined on the basis of actual generation plus backing down and weighted average of percentage allocated capacity share of the beneficiary shall be equal to his total drawal from station (as per regional energy accounting) expressed as percentage of total ex-bus generation. Payment of capacity charges for the period prior to switchover shall be regulated as per tariff applicable till the date of switchover and pro-rata incentive, as applicable, shall be paid. Payment of Capacity Charges for the month after the switchover to tariff as per this order shall be as per the formula given above.

## CHAPTER 3

### HYDRO POWER GENERATING STATIONS

3.1 **Definitions:** Unless the context otherwise requires for the purpose of this chapter,

' **Actual energy** ' means the quantum of energy actually generated by the plant over a specified period (day, year, etc.). The measurement of Actual energy shall be "ex-bus" and shall reflect the energy sent out at the station bus bars.

' **Authority** ' means Central Electricity Authority constituted under Section 3 of the Electricity (Supply) Act 1948.

' **Auxiliary Consumption** ' means the quantum of energy consumed by auxiliary equipment of the project.

'**Capacity Index**' means the average of the daily capacity indices over one year.

' **Daily Capacity Index** ' means percentage of the declared capacity to the maximum available capacity for the day.

$$\text{Daily Capacity Index} = \frac{\text{Declared Capacity (MW)}}{\text{Maximum Available Capacity (MW)}} \times 100$$

'**Declared capacity**' (MW) means the capacity to be available from the plant over the peaking hours of the next day, as declared by the generator. The peaking hours shall be not less than 3 hours within a 24- hour period,

' **Declared Energy** ' means amount of energy to be generated at the plant over the next 24-hour period, as declared by the generator.

' **Deemed Generation** ' means the energy which a generating station was capable of generating but could not generate due to grid/power system conditions beyond the control of generator and it results in spillage of water.

'**Design Energy**' means the quantum of energy which could be generated in a 90 percent dependable year with 95 percent installed capacity of the station.

Explanation - If the total energy generation in the years for which hydrological data is available (say N years) is arranged in descending order, the  $[(N + 1) \times 0.9]^{\text{th}}$  year would represent the 90 percent dependable year. The 90 per cent dependable year is a year in which the annual energy generation has the probability of being equal to or in excess of 90 per cent of the expected period of operation of the scheme.

- (a) Design Energy set out in the Techno-Economic Clearance of the Authority shall be considered for fixation of tariff.
- (b) In case of multi-unit projects, the Design Energy applicable on commissioning of units shall be as set out for the respective unit in the Techno-Economic Clearance of the Authority.
- (c) The Authority may review the Design Energy on completion of the project to consider additional hydrological data which would become available and latest status of completion/commissioning of upstream projects involving consumptive use of water.
- (d) The Authority may also review the Design Energy subsequent to the commissioning of the project as and when any specific information about the change in consumptive use of water upstream or in run off is brought to the notice of the Authority.
- (e) The Design Energy presently in use shall continue to be used for tariff purposes. However, the Authority may review the design energy of all existing projects within a period of 2 years from the issue of this notification.

**'Infirm power'** means sale of electricity prior to commercial operation of the generating unit.

**'Installed Capacity'** means the summation of the name plate capacity of the generating units in the station or the capacity as determined in consultation with the Authority from time to time considering the uprating, derating as may be applicable.

**'Maximum available capacity'** (MW) means the maximum capacity the plant could generate with all units running, under the prevailing conditions of water levels, flows and with 100% gate openings. The peaking hours shall not be less than 3 hours within a 24 hours period.

**' Primary energy '** means the quantum of energy generated up to Design Energy on an annual basis in the station.

**' Project '** includes the complete hydro power generating facility covering all components such as dam, intake, water conductor systems, power station, generating units of the scheme as apportioned to power generation.



' **Saleable Primary energy** ' means the quantum of primary energy available for sale after allowing for free energy to the home state.

' **Saleable Secondary energy** ' means the quantum of secondary energy available for sale after allowing for free energy to the home state.

' **Scheduled energy** ' means the quantum of energy to be generated at the plant over the next 24-hour period, as scheduled by the RLDC.

' **Secondary Energy** ' means the quantum of energy generated in excess of the design energy on an annual basis in the station.

' **Station** ' means a hydro generating station having an installation of one or more hydro generating units, including reversible units

### **3.2 Norms of Operation:**

The norms of operation shall be as under:

(i) **Normative Capacity Index** = 85 percent

(ii) **Auxiliary consumption** :

a) Surface hydro stations with rotating exciters mounted on the generator shaft = 0.2% of energy generated

b) Surface hydro stations with static excitation system  
= 0.5% of energy generated

c) Underground hydro stations with rotating exciters mounted on the generator shaft = 0.4% of energy generated

d) Underground hydro stations with static excitation system  
= 0.7% of energy generated

(iii) **Transformation losses**  
(from generation voltage to transmission voltage)

0.5 percent of energy generated.

(iv) **Date of Commercial Operation:**

Not exceeding 15 days from the date of synchronization.

### **3.3 Capital Expenditure**

The capital expenditure of the project shall be financed as per the approved financial package set out in the techno-economic clearance of the Authority or as approved by an appropriate independent agency, as the case may be. The project cost shall include reasonable amount of capitalized initial spares.

The actual capital expenditure incurred on completion of the project shall form the basis for fixation of tariff. Where the actual expenditure exceeds the approved project cost, the excess expenditure as allowed by the Authority or an appropriate independent agency shall be considered for the purpose of fixation of tariff.

Provided that such excess expenditure is not attributable to the Generating Company or its suppliers or contractors;

Provided further that where a Power Purchase Agreement entered into between the Generating Company and the beneficiary provides a ceiling on capital expenditure, the capital expenditure shall not exceed such ceiling for computation of tariff.

### **3.4 Infirm power**

Any revenue from sale of infirm power shall be taken as reduction in capital expenditure and not as net revenue.

### **3.5 Computation of Annual Charges**

The two-part tariff for sale of electricity from a hydro power station shall comprise the recovery of Annual Capacity Charge and Primary Energy Charges. The charges for a station shall be regulated as follows:

#### **3.5.1 Capacity Charges**

The Capacity Charge shall be computed on the following basis.

Capacity Charge = (Annual Fixed Costs- Primary Energy Charge)

Where,

Annual Fixed Costs (AFC) shall be as follows:

$AFC = IOL + DEP + ROE + O\&M + IWC$

Where,

IOL = Interest on Loan Capital

DEP = Depreciation and Advance against depreciation

ROE = Return on equity

O&M = Operation & Maintenance expenses  
IWC = Interest on working capital

When the capacity charge is negative, this amount shall be set to zero

**(a) Interest on loan capital**

Interest on loan capital shall be computed on the outstanding loans duly taking into account the schedule of repayment, as per the financial package approved by the Authority or an appropriate independent agency, as the case may be.

**(b) Depreciation**

- (i) The value base for the purpose of depreciation shall be the historical cost of the asset.
- (ii) Depreciation shall be calculated annually as per straight line method at the rate of depreciation as prescribed in the Schedule attached to this notification as **Appendix-II**.

Provided that the total depreciation during the life of the project shall not exceed 90% of the approved original cost. The approved original cost shall include additional capitalization on account of foreign exchange rate variation also.

- (iii) Advance against depreciation (AAD), in addition to allowable depreciation, shall be permitted wherever originally scheduled loan repayment exceeds the depreciation allowable as per schedule and shall be computed as follows:

AAD = Originally scheduled loan repayment amount subject to a ceiling of 1/12<sup>th</sup> of original loan amount minus Depreciation as per schedule

- (iv) On repayment of entire loan, the remaining depreciable value shall be spread over the balance useful life of the asset.
- (v) Depreciation shall be chargeable from the first year of operation. In case of operation of the asset for part of the year, depreciation shall be charged on pro-rata basis.
- (vi) Depreciation against assets relating to environmental protection shall be allowed on case-to-case basis at the time of fixation of tariff subject to the condition that the environmental standards as prescribed have been complied with during the previous tariff period.

**(c) Return on Equity:**

Return on equity shall be computed on the paid up and subscribed capital and shall be 16 percent of such capital.

**Explanation:**

Premium raised by the Generating Company while issuing share capital and investment of internal resources created out of free reserve of the existing utility, if any, for the funding of the project, shall also be reckoned as paid up capital for the purpose of computing the return on equity, provided such premium amount and internal resources are actually utilized for meeting the capital expenditure of the power generation project and forms part of the approved financial package as set out in the techno-economic clearance accorded by the Authority or approved by an appropriate independent agency, as the case may be.

**(d) Operation and Maintenance expenses**

- (i) The Operation and Maintenance expenses including insurance (hereinafter referred to as O&M expenses) for the existing stations of NHPC which have been in operation for 5 years or more in the base year of 1999-2000 shall be derived on the basis of actual O&M expenses, excluding abnormal O&M expenses if any for the years 1995-96 to 1999-2000, duly certified by the statutory auditors.

The average of actual O&M expenses for the years 1995-96 to 1999-2000 considered as O&M expenses for the year 1997-98 shall be escalated twice at the rate of 10 percent per annum to arrive at O&M expenses for the Base year 1999-2000, as given below:

$$BO\&M_{2000_i} = AVO\&M_i \times (1.10)^2$$

Where

$BO\&M_{2000_i}$  = Base level O&M expenses for 1999-2000 for ith generating station.

$AVO\&M_i$  = Average O&M expenses from 1995-96 to 1999-2000 for the ith generating station.

The Base O&M expenses for the year 1999-2000 shall be escalated further at the rate of 6 percent per annum to arrive at permissible O&M expenses for the relevant year.

- (ii) In case of new hydro stations of NHPC, which have not been in existence for a period of five years, the Base O&M expenses shall be fixed at 1.5 per cent of the actual capital cost as approved by the Authority or an appropriate Independent agency, as the case may be in the year of commissioning and shall be escalated at the rate of 10 percent per annum from the subsequent year to arrive at O&M expenses for the base year 1999-2000. The Base O&M expenses shall be further escalated at the rate of 6 percent per annum to arrive at permissible O&M expenses for the relevant year.

- (iii) For plants commissioned during the tariff period (2001-02 to 2003-04), the Base O&M expenses shall be fixed at 1.5 percent of the actual capital cost as approved by the Authority or an appropriate Independent agency, as the case may be in the year of commissioning and shall be subject to an annual escalation of 6 percent per annum for the subsequent year.
- (iv) The escalation factor of 6 percent per annum shall be used to revise the base figure of O&M expenses. A deviation of the escalation factor computed from the actual inflation data that lies within 20 percent of the above notified escalation factor of 6 percent (which works out to be 1.2 percentage points on either side of 6 percent) shall be absorbed by the utilities/beneficiaries. In other words if the escalation factor computed from the observed data lies in the range of 4.8 to 7.2 percent, this variation should be absorbed by the utilities. Any deviation beyond this limit shall be adjusted on the basis of the actual escalation factor arrived at by applying a weighted price index of CPI for industrial workers (CPI\_IW) and an index of select components of WPI (WPIOM) as per formula given in note 2 to clause (v) below, for which the utility shall approach the Commission with a petition.
- (v) The escalation of yearly expenses from published data for the tariff period shall be as below:

$$\text{Escalation} = 0.55 \times \text{Infl}_{\text{CPI}} + 0.45 \times \text{Infl}_{\text{WPIOM}}$$

Where

$$\text{Infl}_{\text{CPI}} = \text{Annual Average Inflation in CPI}_{\text{IW}}$$

$$\text{Infl}_{\text{WPIOM}} = \text{Annual Average Inflation in WPIOM}$$

#### **Note 1**

Where as CPI\_IW is directly published by the Government, WPIOM shall be computed from disaggregated data on wholesale prices published by Ministry of Industry.

#### **Note 2**

WPIOM may be obtained as a weighted average of relevant components selected from disaggregated WPI series (1993-94=100) as given below:

<b>COMMODITIES</b>	<b>WEIGHT</b>
1. Lubricants	0.16367
2. Cotton Cloth	0.90306

3. Jute, Hemp and Mesta Cloth	0.37551
4. Paper & Paper Products	2.04403
5. Rubber & Plastic Products	2.38819
6. Basic Heavy Inorganic Chemical	1.44608
7. Basic Heavy Organic Chemical	0.45456
8. Paints Varnishes & Lacquers	0.49576
9. Turpentine, Synthetic Resins, Plastic materials etc	0.74628
10. Matches Explosives & Other Chemicals	0.94010
11. Non-Metallic Mineral Products	2.51591
12. Basic Metals Alloys & Metals Products	8.34186
13. Machinery & Machine Tools	8.36331
14. Transport Equipment & Parts	4.29475
<b>All the Above (WPIOM)</b>	<b>33.47307</b>

$$WPIOM = \frac{\sum_{i=1}^{14} w_i WPI_i}{\sum_{i=1}^{14} w_i}$$
 where  $WPI_i$  is the wholesale price index of the  $i$ th commodity and  $w_i$  is the respective weight

### Note 3

The data used for computing the permissible O&M expenses shall be certified by the statutory auditors,

### Note 4

Where as CPI\_ IW is directly published by the Central Government WPIOM shall be computed from disaggregated data on wholesale prices published by Ministry of Industry.

### (e) Interest on Working Capital

Interest on Working Capital shall cover;

- (i) Operation and Maintenance expenses for one month;
- (ii) Maintenance spares at actuals but not exceeding one year's requirements less value of one fifth of initial spares already capitalized for the first five years; and
- (iii) Receivables equivalent to two months of average billing for sale of electricity.

- (iv) The interest rate for this purpose shall be the cash-credit rates prevailing at the time of tariff filing.

**3.5.2** Full Capacity Charges shall be recoverable if the station achieves Capacity Index of 85%. The Capacity Charges shall be calculated on monthly basis and denominated in Rs./kW/month.

### **3.5.3 Primary Engery Charges**

Energy Charges shall be worked out on the basis of paise per kWh rate on ex-bus energy scheduled to be sent out from the Generating Station after adjusting for the free power delivered to the home state.

Rate of Primary Energy for all hydro stations except for pumped storage stations, shall be taken as 90% of the lowest variable charges of the central sector thermal power station of the concerned region. The primary energy charge shall be computed based on the primary energy rate and saleable energy of the project. This rate shall also be the rate to be used in merit order despatch of the plants.

Primary Energy Charge = Primary Saleable Energy (Ex-Bus) \* Primary Energy Rate/(1-r)

Secondary Energy Charge = Secondary Saleable Energy(Ex-Bus)\*  
Secondary Energy Rate/(1-r)

r = 0.12 and represents 12% free power to the home state.

Secondary Energy Rate shall be equal to Primary Energy Rate.

### **3.6 Incentive/Disincentive**

In addition to the 'Capacity Charge' and 'Primary Energy Charge', the generator shall be paid incentive when the Capacity Index (CI) exceeds the normative Capacity Index target of 85%. Incentive shall accrue up to a maximum Capacity Index of 100%. When Capacity Index is less than 85%, disincentive shall be deducted from Capacity Charges paid to the Generating Company on pro-rata basis of the Capacity Index Value.

Incentive shall be payable in accordance with the following formula:

- (a) Incentive = (Annual Fixed Costs - Primary Energy Charge)  
x (CI<sub>A</sub> - CI<sub>N</sub>)  
(This may be a positive or negative quantity)

Where, CI<sub>A</sub> is the Capacity Index achieved and CI<sub>N</sub> is the normative value of Capacity Index in percent.

For the purpose of incentive, the primary energy rate determined for the first year of tariff period shall remain constant throughout the entire tariff period.

The incentives on account of higher Capacity Index and secondary energy shall be payable on monthly basis, subject to cumulative adjustment in each month of the financial year and final adjustment shall be made at the end of the financial year.

The total incentive payment calculated on an annual basis shall be shared by the various beneficiaries as per their individual allocated capacity.

### **3.7 Tax on Income**

Tax on income from core activity of the Generating Company, if any, is to be computed as an expense and shall be recoverable by the Generating Company from the beneficiaries.

Any under or over recoveries of tax shall be adjusted every year on the basis of certificate of statutory auditors.

Provided that:

- (i) Tax on any income streams other than the income from core activity, if any, accruing to the Generating Company shall not constitute as a pass through component in the tariff. Tax on such other income shall be payable by the Generating Company.
- (ii) The station-wise profit before tax as estimated for a year in advance shall constitute the basis for distribution of the Corporate tax liability to all the stations.
- (iii) The benefit of Tax Holiday where applicable as per the provisions of the Income Tax Act, 1961 shall be passed on to the respective stations.
- (iv) The credit for carry forward losses if any shall also be given in an equitable manner for all stations.
- (v) The tax allocated to stations shall be charged to the beneficiaries on the same proportions as annual fixed costs.

### **3.8 Development Surcharge**

The Generating Company shall be entitled to a Development Surcharge of 5% on both Capacity and Primary Energy Charges for the purpose of fresh capacity addition and



project development activities. The Development Surcharge shall not be payable for operations exclusively within a State. The levy of Development Surcharge shall be subject to the following conditions:

- (a) Surcharge collected by the utilities shall be kept in a separate bank account and may be invested in securities of recognised infrastructure funds like IDFC or IDBI Tax free bonds and income therefrom shall also be credited to that bank account;
- (b) The Generating Company shall maintain separate accounts in its books and reflect the balance in the Development Surcharge Reserve Account and the investment represented against the same in their balance sheet;
- (c) On the purchase of the undertaking or on any other such contingency the reserve and the corresponding investments shall be transferred to the successor undertaking to subserve the same objective of fresh capacity addition;
- (d) The fund can be made use of to the extent of 1/3<sup>rd</sup> of the equity requirement for any capacity addition in the respective region and the balance 2/3<sup>rd</sup> being provided by the Generating Company
- (e) To the extent to which the fund is used as equity in any new capacity addition, pro rata reduction for the return on equity in the determination of tariff of the new project shall be allowed;
- (f) A certificate in the prescribed form regarding the use of these funds shall be filed with the Commission every year, duly verified by the statutory auditors of the Generating Company;
- (g) The use of these funds in any other manner shall be only with the prior approval of the Commission either on petition or suo motto for which the due process as per the CERC (Conduct of Business) Regulations shall be followed.

### **3.9 Unscheduled Interchange (UI)**

Variation in actual generation/drawal and scheduled generation/drawal shall be accounted for through Unscheduled Interchange (UI). UI for a Generating Station shall be equal to its actual generation minus its scheduled generation. UI for a beneficiary shall be equal to its total actual drawal minus its total scheduled drawal. UI shall be worked out for each 15 minute time block. Charges for all UI transactions shall be based on average frequency of the time block.

UI Charges =(Actual Energy - Scheduled Energy) \* UI Rate

This may be a positive or negative quantity

The following UI rates shall apply:

<b><u>Average Frequency of time block</u></b>	<b><u>UI rate (Paise per kWh)</u></b>
50.5 Hz and above	0.0
Below 50.5 Hz and up to 50.48 Hz	5.6
Below 49.04 Hz and up to 49.02 Hz	414.4
Below 49.02 Hz	420.0
Between 50.5 Hz and 49.02 Hz	linear in 0.02 Hz step

(each 0.02 Hz step is equivalent to 5.6 paise/kWh within the above range)

The above average frequency range and UI rates are subject to change through a separate notification or order of the Commission from time to time.

The provisions relating to UI shall come into force in accordance with the following time schedule, after implementation of ABT.

Southern Region	:	01-04-2001
Eastern Region	:	01-05-2001
Northern Region	:	01-06-2001
Western Region	:	01-08-2001
North Eastern Region	:	Date will be notified subsequently.

### **3.10 Rebate**

For payment of bills through letter of credit on presentation, a rebate of 2.5 percent shall be allowed. Where payments are made subsequently through opening of letter of credit or otherwise, but within a period of one month of presentation of bills by the Generating Company, a rebate of 1 percent shall be allowed.

### **3.11 Late Payment Surcharge**

In case the payment of bills by the beneficiary (ies) is delayed beyond a period of 1 month from the date of billing a late payment surcharge at the rate of 1.5 percent per month shall be levied by the Generating Company.

### **3.12 Deemed Generation**

In case of reduced generation due to the reasons beyond the control of Generating Company or on account of non-availability of board's transmission lines or on receipt of backing down instructions from the concerned Regional Load Despatch Centre resulting in spillage of water, the energy charges on account of such spillage shall be payable to the Generating Company. Apportionment of energy charges for such spillage among the beneficiaries shall be in proportion to their shares in saleable capacity of the station.

Energy charges on the above account shall not be admissible if the energy generated during the year is equal to or more than Design Energy.

### **3.13 Scheduling**

The methodology of scheduling shall be as under:

- (i) Each day starting from 00.00 hrs. shall be divided into 96 time blocks of 15 minutes intervals.
- (ii) The generator shall make an advance declaration of capacity of its generating station. The declaration shall for that capacity which can be actually made available for a period of time not less than 3 hours within a 24 hour period.

The generator shall intimate the declared capacity(MW), maximum available capacity(MW) and total Ex-Bus (MWh) to RLDC to enable it to prepare the schedule.

The declaration should also include limitation on generation during any specific time period of the day on account of restriction(s) on water usage, etc.

It shall be ensured that declared capacity does not exceed the installed capacity of the plant ordinarily. The over load capacity of the plant, wherever available, shall also be declared in case of systems requirements.

- (iii) While making or revising its declaration of capacity, the generator shall ensure that its declared capacity during peak hours is not less than that during other hours. However, exception to this rule shall be allowed in case of tripping /re-synchronization of units as a result of forced outage of units.
- (iv) The generation scheduling shall be done in accordance with the operating procedure, as stipulated in the IEGC.
- (v) Based on the declaration of the generator, RLDC shall communicate to the beneficiaries their shares out of which they shall give their requisitions.
- (vi) Based on the requisitions given by the beneficiaries and taking into account technical limitations on varying the generation and also taking into account transmission system constraints, if any, RLDC shall prepare the economically optimal generation schedules and drawal schedules and communicate the same to generator and the beneficiaries.

RLDC shall also formulate the procedure for meeting contingencies both in the long run and in the short run (Daily scheduling).

- (vii) The scheduled generation and actual generation shall be at the generating station's ex-bus MWh. For beneficiaries, the scheduled and actual net drawals shall be at their receiving points.
- (viii) For calculating the net drawal schedules of beneficiaries, the transmission losses shall be apportioned in proportion to their drawals.
- (ix) Scheduled generation of the generating station for each time block shall mean the Scheduled MWh Sent Out Ex-bus from the generating station.
- (x) Actual generation of the generating station for each time block shall mean the actual MWh Sent Out Ex-bus from the generating station.
- (xi) In case of forced outage of a unit, RLDC shall revise the schedules on the basis of revised declared capacity. The revised schedules shall become effective from the 4<sup>th</sup> time block, counting the time block in which the revision is advised by the generator to be first one. The revised declared capacity shall also become effective from the 4<sup>th</sup> time block.
- (xii) In the event of bottleneck in evacuation of power due to any constraint, outage, failure or limitation in the transmission system, associated switchyard and sub stations owned by CTU (as certified by RLDC) necessitating reduction in generation, RLDC shall revise the schedules which shall become effective from the 4<sup>th</sup> time block, counting the time block in which the bottleneck in evacuation of power has taken place to be the first one. Also, during the first, second and third time blocks of such an event, the scheduled generation of the station shall be deemed to have been revised to be equal to actual generation and also the scheduled drawals of the beneficiaries shall be deemed to have been revised to be equal to their actual drawals.
- (xiii) In case of any grid disturbance, scheduled generation of all the generating stations and scheduled drawal of all the beneficiaries shall be deemed to have been revised to be equal to their actual generation/drawal for all the time blocks affected by the grid disturbance. Certification of grid disturbance and its duration shall be done by RLDC.
- (xiv) Revision of declared capability by generator(s) and requisition by beneficiary(ies) for the remaining period of the day shall also be permitted with advance notice. Revised schedules/declared capability in such cases shall become effective from the 6<sup>th</sup> time block, counting the time block in which the request for revision has been received in RLDC to be the first one.

- (xv) If, at any point of time, RLDC observes that there is need for revision of the schedules in the interest of better system operation, it may do so on its own and in such cases, the revised schedules shall become effective from the 4<sup>th</sup> time block, counting the time block in which the revised schedule is issued by RLDC to be the first one.
- (xvi) Generation schedules and drawal schedules issued/revised by RLDC shall become effective from designated time block irrespective of communication success.
- (xvii) For any revision of scheduled generation, including post facto deemed revision, there shall be a corresponding revision of scheduled drawals of the beneficiaries.
- (xviii) A procedure for recording the communication regarding changes to schedule duly taking into account the time factor shall be evolved by CTU.
- (xix) a) Run-of-River type hydro stations

Since there is no regulation possible in such stations, these shall be treated as must run stations. The maximum declared capacity, duly taking into account the over load capability, must be equal to or greater than that required to make full use of the available water. There shall be no spillage, unless plant is operating at full plant capacity.

b) Diurnal storage & long term Storage hydro stations

These type of hydro stations are designed to operate during peak hours to meet system peak demand. The declared capacity shall be equal the maximum available capacity of the plant including overload capacity, wherever applicable. RLDCs shall ensure that generation schedules of such type of stations shall be prepared and the stations dispatched accordingly except in the event of specific system requirements/constraints.

### **3.14 Demonstration of Declared Capacity**

The Generating Company may be required to demonstrate the declared capacity of its generating station as and when asked by the RLDC of the region in which the generating station is situated. In the event of Generating Company failing to demonstrate the declared capacity within a tolerance limit specified by CTU, the capacity charges due to the Generating Company shall be reduced as a measure of penalty.

The quantum of penalty for the first mis-declaration for any 24 hour period shall be the charges corresponding to two days fixed charges. For the second mis-declaration the penalty shall be equivalent to fixed charges for four days and for

subsequent mis-declarations, the penalty shall be multiplied in the geometrical progression as per the order of the Commission.

A procedure shall be evolved by RLDCs for testing the declared capacity of a station in the event of minimum flow available in case of Run-of-River and pondage type hydro stations.

**Note :**

In case it is observed that the declared capacity and/or declared energy given by the generator is repeatedly under-stated compared with actual generation within a tolerance specified by the CTU, then UI charges due to the generator on account of such extra generation shall be reduced to zero and the amount shall be credited towards UI account of beneficiaries in the ratio of their capacity share in the station.

The operating log books of the generating station shall be available for review by the RLDC. These books keep record of machine operation and maintenance, reservoir level and spillway gate operation.

### **3.15 Metering and Accounting**

Metering arrangements, including installation, testing and operation and maintenance of meters and collection, transportation and processing of data required for accounting of energy exchanges and average frequency on 15 minute time block basis shall be provided by the POWERGRID/RLDC. Processed data of the meters along with data relating to declared capability and schedules etc., shall be supplied by RLDCs to REBs and REBs shall issue the Regional Accounts for energy as well as UI charges on monthly basis. The UI accounting procedures shall be governed by the orders of the Commission.

### **3.16 Billing and Payment of Capacity Charges**

Billing and Payment of Capacity Charges shall be done on a monthly basis in the following manner:

- (i) Each beneficiary shall pay the Capacity Charges in proportion to its percentage share in total saleable capacity of the station, adjusted for the home state free capacity.

**Note 1:** Allocation of total capacity of Central Sector Stations is made by Gol from time to time which also has an unallocated portion. Allocation of the unallocated portion shall be made by the Gol from time to time, for the total unallocated capacity. The total capacity share of any beneficiary would be sum of its capacity share plus allocation out of the unallocated portion. In case of no specific distribution of unallocated power by the Gol,

the unallocated power shall be added to the allocated shares in the same proportion as the allocated shares.

**Note 2:** The beneficiaries may propose surrendering part of their allocated share to other States within/outside the region. In such cases, depending upon the technical feasibility of power transfer and specific agreements reached by the generating company with other States within/outside the region for such transfers, the shares of beneficiaries may be re-allocated by the Gol for a specific period. When such re-allocations are made, the beneficiaries who surrender the share shall not be liable to pay capacity charges for the surrendered share. The capacity charge for capacity surrendered and reallocated as above shall be paid by the State(s) to whom the surrendered capacity is allocated. Except for the period of reallocation of capacity as above, the beneficiaries of the generating station shall continue to pay the full fixed charges as per allocated capacity shares.

- (ii) The beneficiaries shall have full freedom for negotiating any transaction for utilization of capacity shares. In such cases, the beneficiary having allocation in the capacity of the generating station shall be liable for full payment of capacity charge and energy charge (including that for sale of power under the transactions negotiated by them) for all its scheduled and unscheduled transactions from its capacity shares.
- (iii) If there is any capacity which remains un-requisitioned during day –to-day operation, RLDC shall advise all beneficiaries in the region and the other RLDCs so that such capacity may be requisitioned through bilateral arrangements with the concerned generating company/beneficiary(ies) under intimation to the RLDC.
- (iv) The capacity charges shall be paid by the beneficiary(ies) including those outside the Region to the generator every month in accordance with the following formulae:

$$\begin{aligned} 1^{\text{st}} \text{ month} &= (1 \times \text{ACC1})/12 \\ 2^{\text{nd}} \text{ month} &= (2 \times \text{ACC2} - 1 \times \text{ACC1})/12 \\ 3^{\text{rd}} \text{ month} &= (3 \times \text{ACC3} - 2 \times \text{ACC2})/12 \\ 4^{\text{th}} \text{ month} &= (4 \times \text{ACC4} - 3 \times \text{ACC3})/12 \\ 5^{\text{th}} \text{ month} &= (5 \times \text{ACC5} - 4 \times \text{ACC4})/12 \\ 6^{\text{th}} \text{ month} &= (6 \times \text{ACC6} - 5 \times \text{ACC5})/12 \\ 7^{\text{th}} \text{ month} &= (7 \times \text{ACC7} - 6 \times \text{ACC6})/12 \\ 8^{\text{th}} \text{ month} &= (8 \times \text{ACC8} - 7 \times \text{ACC7})/12 \\ 9^{\text{th}} \text{ month} &= (9 \times \text{ACC9} - 8 \times \text{ACC8})/12 \\ 10^{\text{th}} \text{ month} &= (10 \times \text{ACC10} - 9 \times \text{ACC9})/12 \\ 11^{\text{th}} \text{ month} &= (11 \times \text{ACC11} - 10 \times \text{ACC10})/12 \\ 12^{\text{th}} \text{ month} &= (12 \times \text{ACC12} - 11 \times \text{ACC11})/12 \end{aligned}$$

$$i^{th} month = \frac{ACC_i}{12} + \frac{(i-1)}{12} * (ACC_i - ACC_{i-1})$$

and, each beneficiary having firm allocation in capacity from the generating station shall pay:

$$\begin{aligned}
 1^{st} \text{ month} &= [ ACC1 \quad xWB1 ] / 1200 \\
 2^{nd} \text{ month} &= [ 2xACC2 \quad xWB2 \quad - 1xACC1xWB1 ] / 1200 \\
 3^{rd} \text{ month} &= [ 3xACC3 \quad xWB3 \quad - 2xACC2xWB2 ] / 1200 \\
 4^{th} \text{ month} &= [ 4xACC4 \quad xWB4 \quad - 3xACC3xWB3 ] / 1200 \\
 5^{th} \text{ month} &= [ 5xACC5 \quad xWB5 \quad - 4xACC4xWB4 ] / 1200 \\
 6^{th} \text{ month} &= [ 6xACC6 \quad xWB6 \quad - 5xACC5xWB5 ] / 1200 \\
 7^{th} \text{ month} &= [ 7xACC7 \quad xWB7 \quad - 6xACC6xWB6 ] / 1200 \\
 8^{th} \text{ month} &= [ 8xACC8 \quad xWB8 \quad - 7xACC7xWB7 ] / 1200 \\
 9^{th} \text{ month} &= [ 9xACC9 \quad xWB9 \quad - 8xACC8xWB8 ] / 1200 \\
 10^{th} \text{ month} &= [ 10xACC10 \quad xWB10 \quad - 9xACC9xWB9 ] / 1200 \\
 11^{th} \text{ month} &= [ 11xACC11 \quad xWB11 \quad - 10xACC10xWB10 ] / 1200 \\
 12^{th} \text{ month} &= [ 12xACC12 \quad xWB12 \quad - 11xACC11xWB11 ] / 1200
 \end{aligned}$$

$$i^{th} month = \frac{ACC_i * WB_i}{12} + \frac{(i-1)}{12} * (ACC_i * WB_i - ACC_{i-1} * WB_{i-1})$$

Where

ACC1, ACC2, ACC3, ACC4, ACC5, ACC6, ACC7, ACC8, ACC9, ACC10, ACC11 and ACC12 are the amount of Capacity Charge for the period up to the end of 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> months respectively.

And, WB1, WB2, WB3, WB4, WB5, WB6, WB7, WB8, WB9, WB10, WB11 and WB12 are the weighted average of percentage allocated capacity share of the beneficiary during the cumulative period upto 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> months respectively.

Year means the financial year.

When the month of change over to tariff as per this notification is the first month of a financial year, then 'capacity index' for the part of the year prior to switchover shall be "deemed capacity index" determined on the basis of actual generation plus backing down and weighted average of percentage allocated capacity share of the beneficiary shall be equal to its total drawal from station (as per regional energy accounting) expressed as percentage



of total ex-bus generation. Payment of capacity charges for the period prior to switchover shall be regulated as per tariff applicable till the date of switchover and pro-rata incentive, as applicable shall be paid. Payment of Capacity Charges for the month after the switchover to tariff shall be as per the formula given above.

## CHAPTER 4

### INTER-STATE TRANSMISSION

#### 4.1. Definitions

Unless the context otherwise requires, for the purpose of this chapter:

- (i) **'Authority'** means Central Electricity Authority established under section 3 of the Electricity (Supply) Act, 1948.
- (ii) **'Availability'** in relation to a transmission system for a given period means the time in hours during that period the transmission system is capable to transmit electricity at its rated voltage from the supply point to the delivery point and shall be expressed in percentage of total hours in the give period.
- (iii) **'Commission'** means the Central Electricity Regulatory Commission established under Section 3 of the Electricity Regulatory Commissions Act, 1998.
- (iv) **'Contract Path'** means the shortest route formed by a series of transmission lines capable of carrying contracted power between the point of receipt to point of delivery in the wheeling system.
- (v) **'Contracted Power'** means the power in MW which the wheeling utility has agreed to carry or which the wheeling utility is required to carry as per allocation/agreement between the importing and exporting utility.
- (vi) **'Rated Voltage'** means the manufacturers design voltage at which the transmission system is designed to operate or such lower voltage at which the line is charged, for the time being, in consultation with supplier and receiver of electricity.
- (vii) **'Transmission Service Agreement'** means the agreement, contract, memorandum of understanding, or any such covenants, entered into between the Transmission Utility and the beneficiary of the transmission service.
- (viii) **'Transmission System'** means a line with associated Sub-Stations or a group of lines inter-connected together alongwith associated sub-stations.
- (ix) **'Transmission Utility'** means any Generating Company, board, licensee or other person engaged in the inter-state transmission of energy.

- (x) ' **Wheeling**' means the operation whereby the transmission system and associated facilities of Transmission Utility are used by another person for conveyance of electricity.

#### 4.2 **Norms of Operation**

The norms of operation, subject to modifications thereof from time to time shall be as under:-

(i) **Date of Commercial Operation**

The date of commercial operation shall be the date of charging the transmission system to its rated voltage level or seven days after the date on which it is declared ready for charging by the transmission utility, but not able to charge for reasons not attributable to its suppliers or contractors.

(ii) **Auxiliary Power Consumption in the Sub-Station:**

- (a) AC System - NIL

#### **Note**

The auxiliary consumption in the AC sub-station for the purpose of air-conditioning, lighting, technical consumption, etc. shall be borne by the transmission utility as part of its operation & maintenance expenses.

- (b) For HVDC Sub-station -

For Auxiliary power consumption in HVDC stations GoI shall allocate appropriate share from the ISGS / Central Power Stations in the region. Fixed charges for such power shall be borne by the beneficiaries of the region and ISGS shall bill the Transmission Utility only for the variable charges.

(iii) **Normative Availability of the Transmission System**

The Normative Availability of the Transmission System shall be 98% and shall be calculated as per the procedure contained in **Appendix - III** to this notification.

#### 4.3. **Capital Cost and capital structure**

- (a) The capital expenditure of the Transmission System shall be financed as per the approved financial package set out in the

techno-economic clearance of the Authority or as approved by an appropriate independent agency, as the case may be.

- (b) The capital cost shall include capitalised initial spares for the first 5 years of operation. The approved project cost shall be the cost which has been specified in the techno-economic clearance of the Authority or as approved by an appropriate independent agency, as the case may be.
- (c) The actual capital expenditure incurred on completion of the project shall be the criterion for the fixation of tariff. Where the actual expenditure exceeds the approved project cost the excesses as approved by the Authority or an appropriate independent agency, as the case may be, shall be deemed to be the actual capital expenditure for the purpose of determining the tariff, provided that excess expenditure is not attributable to the 'Transmission Utility' or its suppliers or contractors:

Provided further that where a transmission services agreement entered into between the Transmission Utility and the beneficiary provides a ceiling on capital expenditure, the capital expenditure shall not exceed such ceiling.

#### **4.4 Computation of Transmission Charges**

The single part tariff for transmission of electricity by a transmission system shall comprise the recovery of annual transmission charges consisting of interest on loan capital, depreciation, advance against depreciation, operation and maintenance expenses, return on equity and interest on working capital at a normative availability level. The taxes on income reckoned as expenses at actuals on core business and FERV shall be regulated as prescribed.

The annual Transmission Charges shall be computed on the following basis, namely:-

**(a) Interest on loan Capital**

Interest on loan capital shall be computed on the outstanding loans, duly taking into account the schedule of repayment, as per the financial package approved by the Authority or any independent agency.

**(b) Depreciation :**

- (i) The value base for the purpose of depreciation shall be the historical cost of the asset.

- (ii) Depreciation shall be calculated annually as per straight line method at the rate of depreciation as prescribed in the Schedule attached to this notification in **Appendix II**.

Provided that the total depreciation during the life of the project shall not exceed 90% of the approved Original Cost. The approved original cost shall include additional capitalization on account of foreign exchange rate variation also.

- (iii) Advance against depreciation (AAD), in addition to allowable depreciation, shall be permitted wherever originally scheduled loan repayment exceeds the depreciation allowable as per schedule and shall be computed as follows:

AAD = Originally scheduled loan repayment amount subject to a ceiling of  $1/12^{\text{th}}$  of original loan amount      Depreciation as per the schedule

- (iv) On repayment of entire loan, the remaining depreciable value shall be spread over the balance useful life of the asset.
- (v) Depreciation shall be chargeable from the first year of operation. In case of operation of the asset for part of the year, depreciation shall be charged on pro-rata basis.
- (vi) Depreciation against assets relating to environmental protection shall be allowed on case-to-case basis at the time of fixation of tariff subject to the condition that the environmental standards as prescribed have been complied with during the previous tariff period.

**(c) Return on Equity**

Return on equity shall be computed on the paid up and subscribed capital relatable to the transmission system and shall be 16 percent of such capital.

**Explanation:-1**

Premium raised by the Transmission Utility while issuing share capital & investment of internal resources created out of free reserve of the existing utility, if any, for the funding of the project, shall also be reckoned as paid up capital for the purpose of computing the return on equity, provided such premium amount and internal resources are actually utilised for meeting the capital expenditure of the Transmission project and forms part of the approved financial package as set out in the techno-economic clearance accorded by the Authority.

**(d) Operation and Maintenance expenses**

Operation and maintenance expenses including expenses on insurance, if any, (hereinafter referred to as O&M expenses) shall be calculated as under

- i) Where the O&M expenses, excluding abnormal O&M expenses if any on sub-stations(OMS) and lines (OML), are separately available for each region, these shall be normalized by dividing them by number of bays and line length respectively. Where data as aforesaid is not available, O&M expenses in the region shall be apportioned to the sub-stations and lines on the basis of 30:70 ratio and these shall be normalized as below :

O&M Expenses per unit of line length in Kilometers (OMLL)

**OMLL**= O&M expenses for lines (OML) /Average line length in kilometers (LL).

O&M expenses for Sub stations (OMBN)

**OMBN** = O&M expenses for substations (OMS) / Average number of bays(BN).

- ii) The five years average of the normalized O&M expenses for lines and for bays (for the period 1995-96 to 1999-2000) shall be escalated at 10 percent per annum for two years (1998-99 and 1999-2000) to arrive at the norm for O&M expenses per unit of line length and per bay for 1999-2000.

Normative O&M per unit of line length (NOMLL) = AVOMLL x (1.10)<sup>2</sup>

Normative O&M per bay (NOMBN) = AVOMBN x (1.10)<sup>2</sup>

Where AVOMLL & AVOMBN are average O&M expenses per unit of line length and per bay respectively.

$$AVOMLL = \frac{\sum_{i=1995-96}^{1999-2000} OMLi}{\sum_{i=1995-96}^{1999-2000} LLi}$$

$$AVOMBN = \frac{\sum_{i=1995-96}^{1999-2000} OMSi}{\sum_{i=1995-96}^{1999-2000} BNi}$$

Where LLi and BNi is the average line length and number of bays respectively in the given year i.

- (iii) NOMLL & NOMBN for the regions derived in the preceding paragraph shall be escalated at the rate of 6 percent per annum to obtain the normative values of O&M expenses per unit of line length and per bay in the relevant year. These normative values shall be multiplied by the line

length and number of bays (as the case may be) in a given system in that year to compute the permissible O&M expenses for that system.

- (iv) The escalation factor of 6 percent per annum shall be used to revise the normative base figure of O&M expenses. A deviation of the escalation factor computed from the actual inflation data that lies within 20 percent of the above notified escalation factor of 6 percent (which works out to be 1.2 percentage points on either side of 6 percent) shall be absorbed by the utilities/beneficiaries. In other words if the escalation factor computed from the observed data lies in the range of 4.8 to 7.2 percent, this variation should be absorbed by the utilities. Deviations beyond this limit shall be adjusted on the basis of the actual escalation factor arrived at on the basis of a weighted price index of CPI for industrial workers (CPI\_IW) and an index of select components of WPI (WPITR) as per formula given below, for which the utility shall approach the Commission with a petition:
- (v) The actual escalation factor during the tariff period shall be computed from the published data as below:

$$\text{Escalation} = 0.55 \times \text{Infl}_{\text{CPI}} + 0.45 \times \text{Infl}_{\text{WPITR}}$$

Where

$\text{Infl}_{\text{CPI}}$  = Annual Average Inflation in CPI\_IW.

$\text{Infl}_{\text{WPITR}}$  = Annual Average Inflation in WPITR (to be calculated as under)

- (vi) WPITR is computed as a weighted average of relevant components (listed below) selected from disaggregated WPI series (1993-94=100).

<u>COMMODITIES</u>	<u>WEIGHT</u>
1. Cotton Cloth	0.90306
2. Paper & Paper Products	2.04403
3. Rubber & Plastic Products	2.38819
4. Paints Varnishes & Lacquers	0.49576
5. Turpentine, Synthetic Resins, Plastic Materials etc	0.74628
6. Non-Metallic Mineral Products	2.51591
7. Basic Metals Alloys & Metals Products	8.34186
8. Machinery & Machine Tools	8.36331
9. Transport Equipment & Parts	4.29475
All the Above (WPITR)	30.0931

$$WPITR = \frac{\sum_{i=1}^9 w_i WPI_i}{\sum_{i=1}^9 w_i}$$

where  $WPI_i$  is the Wholesale Price Index for the  $i$ th sub-group and  $w_i$  is its respective weight

**Note**

O&M expenses on account of network expansion in a given Financial Year shall be computed on the basis of relevant normative O&M expenses per unit of line length or number of bays. The normative O&M expenses for 1999-2000 (NOMLL and NOMBN as the case may be) shall be escalated at 6 percent per annum to bring them to level of relevant year. These normative expenses multiplied by the line length or the number of bays, as the case may be, for added the year in which expansion has taken place shall give the O&M expenses on account of network expansion per year. For the year of commissioning, the O&M expenses for lines and bays added shall be apportioned for on the basis of their months in operation during that year.

**Note**

Where as CPI\_IW is directly published by the Government, WPITR shall be computed from disaggregated data on wholesale prices published by Ministry of Industry.

**Note**

The data used for computing the permissible O&M expenses shall be certified by the statutory auditors,

**(e) Interest on Working Capital**

Interest on working capital shall cover;

- (i) operation and maintenance expenses (cash) for one month;
- (ii) maintenance spares at a normative rate of 1% of the Capital cost less 1/5<sup>th</sup> of the initial capitalized spares. Cost of maintenance spares for each subsequent year shall be revised at the rate applicable for revision of expenditure on O&M of transmission system and
- (iii) receivables equivalent to two months' average billing calculated on normative availability level.



#### 4.5 Tax on Income

Tax on the income streams of the Transmission Utility from core activity, if any, to be computed as an expense at shall and shall be recovered from the beneficiaries.

Any under-recoveries or over recoveries of tax shall be adjusted every year on the basis of certificate of statutory Auditors.

Provided:

- (i) Tax on any other income streams, other than the core activity, shall not constitute a pass through component in the tariff. Tax on such other income shall be payable by the Transmission Utility.
- (ii) The region-wise profit before tax as estimated for a year in advance shall constitute the basis for distribution of the Corporate tax liability to all the regions.
- (iii) The benefits of Tax Holiday applicable as per the provisions of the Income Tax Act, 1961 shall be passed on to the beneficiaries.
- (iv) The credit for carry forward losses could also be given in the same proportion as mentioned above (in the Sub clause (ii)) in the absence of any other equitable basis.
- (v) The tax allocated to regions shall be charged to the beneficiaries on the same lines as annual fixed charges/existing charges.

#### 4.6. Payment of Transmission Charges

Full annual transmission charges shall be recoverable at 98 percent Availability of Operation. Payment of transmission charge below 98 percent shall be on pro-rata basis. There shall not be any payment of annual transmission charges for availability level above 98 percent. The transmission charge shall be calculated on monthly basis. In case of more than one beneficiaries of the transmission system, the monthly transmission charge leviable to each beneficiary shall be computed as per the following formula.

$$\text{Transmission Charges} = \frac{\text{TC}}{12} \times \frac{\text{EB}}{\text{ES}}$$

Where TC = Annual Transmission Charges payable by the beneficiaries.

- EB = Monthly energy sale from Central Sector Stations as may come in the system to each beneficiary individually as per Regional Energy Account.
- ES = Total monthly energy sale from Central Sector Stations.

**Note**

When availability based generation tariff and unscheduled interchange tariff is introduced for payment of 'generation/ unscheduled interchange charges by the beneficiaries, the monthly transmission charges leviable to each beneficiary shall be computed as per their respective capacity allocation from ISGS or per the transmission agreement, if any.

**4.7 Incentive**

The Transmission Utility shall be entitled to incentive beyond the Availability of 98% as per table below:

Availability %	Incentive As a percent of equity	Cumulative Incentive As a percent of equity
98% and below	0.00	0.00
98.01% -98.50%	1.00	1.00
98.51% - 99.00%	1.00	2.00
99.01% - 99.50%	1.00	3.00
99.51 –99.75%	1.00	4.00

**4.8 Principle of sharing of Transmission Charges of the inter-regional assets including HVDC system by the beneficiaries**

The Transmission Charges of the inter-regional assets including HVDC system shall be shared in the ratio of 50:50 by the two contiguous regions. These Transmission Charges shall be recovered from the beneficiaries by pooling 50% of the Transmission Charges for such inter-regional assets with the Transmission Charges for transmission system of the respective regions.

**4.9 Wheeling Charges for inter-state transmission :**

**4.9.1 Wheeling on POWERGRID/Licensee’s system:**

4.9.1.1 In case of inter-regional transmission of power through the transmission system belonging to POWERGRID or any Licensee, the total monthly charges payable to them by the importing, exporting and intermediary regions (if any) shall remain the same.

4.9.1.2 Till introduction of ABT, the sharing of monthly transmission charges shall be in proportion to energy drawal. In case of importing region, the monthly transmission charges payable to POWERGRID/Licensee shall be shared in proportion to energy drawal as per Regional Energy Accounting including energy drawn from exporting region. In case of exporting region, the monthly transmission charges payable to POWERGRID/Licensee shall be shared by its constituents and beneficiaries (importing utilities) outside the region in proportion to energy drawal as per Regional Energy Accounting. Subsequent to introduction of ABT, sharing of the monthly transmission charges shall be on the basis of capacity allocation and contracted power. No transmission charges shall, however, be payable by the importing utility for utilisation of POWERGRID/Licensee system in intermediary region(s).

4.9.1.3 The transmission losses shall be payable for utilisation of the POWERGRID/Licensee's system.

#### **4.9.2 Wheeling through SEB/State Utility system:**

4.9.2.1 In case of wheeling of power through SEB/state utility system, the importing utility and the wheeling utility shall endeavour to mutually agree on wheeling charges as well as transmission losses. In such cases, approval of the Commission shall not be required. However, the wheeling utility shall not deny use of its system merely on the basis of non-agreement on wheeling charges.

4.9.2.2 If the parties are not able to agree on the wheeling charges, the Contract Path method shall be used for calculation of wheeling charges. Monthly transmission charges of this path would be payable in proportion to contracted power vis-à-vis SIL of the lines in the contracted path. The monthly transmission charges for the contract path shall be calculated as per the provisions of this notification.

4.9.2.3 In case, wheeling utility makes some special arrangement (such as backing down cheaper generation) to facilitate exchange, the verifiable opportunity cost or the charges calculated as per contract path method, whichever is higher, shall be payable to the wheeling utility. In any case, the wheeling charges shall not exceed the charges corresponding to a new transmission line of adequate capacity along the contracted path. The Member Secretary, REB of the region in which wheeling utility is located, shall calculate wheeling charges by applying the principles enumerated above.

4.9.2.4 The incremental transmission losses on account of wheeling shall be payable in kind i.e. the transmission losses shall be compensated by an equivalent amount of energy charged to the importing utility. In case of non-agreement on the issue of transmission losses, the studies to determine incremental transmission losses in the wheeling

utility system shall also be carried out by the Member Secretary of the region concerned.

- 4.9.2.5 The Commission may be approached in case of disagreement with the decision of Member Secretary, REB. Pending the final order of the Commission, decision of the Member Secretary, REB shall be implemented on provisional basis.

#### **4.10 Development Surcharge**

The Transmission Utility shall be entitled to a Development Surcharge of 10 percent on every bill raised by it on account of transmission charges at regional level. The levy of Development Surcharge shall be subject to the following conditions:

- (a) Surcharge collected by the transmission utility shall be kept in a separate bank account and may be invested in securities of recognised infrastructure funds like IDFC or IDBI Tax free bonds and income therefrom shall also be credited to that bank account;
- (b) The transmission utility shall maintain separate accounts in its books and reflect the balance in the Development Surcharge Reserve Account and the investment represented against the same in its balance sheet;
- (c) On the purchase of the undertaking or on any other such contingency the reserve and the corresponding investments shall be transferred to the successor undertaking to subserve the same objective of fresh capacity addition;
- (d) The fund can be made use of to the extent of 1/3<sup>rd</sup> of the equity requirement for any capacity addition in the respective region and the balance 2/3<sup>rd</sup> being provided by the transmission utility;
- (e) To the extent to which the fund is used as equity in any new capacity addition, pro rata reduction for the return on equity in the determination of tariff of the new project shall be allowed ;
- (f) A certificate in the prescribed form regarding the use of these funds shall be filed with the Commission every year, duly verified by the statutory auditors of the Transmission Utility.
- (g) The use of these funds in any other manner shall be only with the prior approval of the Commission either on petition or suo motto for which the due process as per the CERC (Conduct of Business) Regulations shall be followed.

#### **4.11 Rebate**

For payment of bills through letter of credit on presentation, a rebate of 2.5 percent shall be allowed. Where payments are made subsequently through opening of letter of credit

or otherwise, but within a period of one month of presentation of bills by the Transmission Utility, a rebate of 1 percent shall be allowed.

**4.12 Late payment surcharge**

In case the payment of bills by the beneficiary (s) is delayed beyond a period of 1 month from the date of billing a late payment surcharge at the rate of 1.5 percent per month shall be levied by the 'Transmission Utility'

(K. Venugopal)  
Secretary