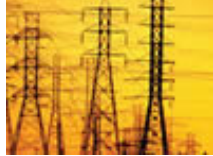


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**Draft: Bangladesh Energy Regulatory Commission Electricity Distribution Tariff Regulations, 2008**

## Bangladesh Energy Regulatory Commission (BERC)

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The Bangladesh Energy Regulatory Commission in exercise of the power conferred by the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003) as amended, hereby adopts the following regulation.

### 1. SHORT TITLE AND COMMENCEMENT:

- This regulation shall be called Bangladesh Energy Regulatory Commission Electricity Distribution Tariff Regulation, 2008.
- It shall come into force upon publication in the official Gazette.

### 2. SCOPE AND APPLICATION:

- This Regulation shall define: (1) the process of submitting an application by a Licensee for an initial tariff rate, terms, and conditions of service, or a change thereof; (2) the methodology to be used by the Commission in reviewing the application; (3) and the procedures for the issuance of an approved initial tariff rate, terms and conditions of service of the applicant licensee; or an approved change thereof.
- This Regulation shall apply to licensed applicants for electric distribution, including the sale of electric energy at retail to the end-user.
- In developing this regulation, the Commission has taken into consideration: Electricity Act, Related Presidential Order, Rural Electrification Act and DESA Act; and other applicable acts, orders, etc.

### 3. DEFINITIONS:

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a. Words, terms and phrases that are defined in the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003), including subsequent amendments to the Act, and Commission's Regulations, shall have the same meaning for the purposes of this Electric Distribution Tariff Regulation.

b. Words, terms and phrases that are not defined in this Regulation or in the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003), including subsequent amendments to the Act and Commission's Regulations, shall have the meaning assigned to them in the Electricity Act, 1910 (Act No 9 of 1910); or other applicable legislation. Words, terms and phrases that are not defined in either the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003), including subsequent amendments to the Act, and the Regulations, or in the Electricity Act, 1910 (Act No 9 of 1910) shall be defined by the Commission as needed.

c. Unless the context requires otherwise, the words, terms and phrases in the Electric Distribution Tariff Regulation and any attachments hereto shall have the following meanings:

(1) "Acceptance Date" means the date on which a tariff application has been officially received with all of the requisite documents by the Commission, and the process for hearing commences

(2) "Accounts" means the accounts prescribed in the uniform system of accounts

(3) "Act" means the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003) including any subsequent amendments.

(4) "Applicant" means a licensed entity who applied to the Commission in accordance with these Regulations to establish tariffs with rates for operations by the licensee.

(5) "Commission" means the Bangladesh Energy Regulatory Commission.

(6) "Bundled Rate" means the authorized charges, per unit or level of consumption, for a specified time period for any of the classes of bundled service provided to a customer.

(6.1) "Bundled Service" means a packaged energy retail delivery service that includes generation, transmission, and distribution.

(7) "Distributed Generation" means electricity produced for retail sale by a small electric generator directly interconnected to a distribution tariff applicant's distribution system, with no interconnection to the transmission grid.

(8) "Effective Date" means the date on which a proposed tariff schedule with rates is permitted by the Commission to become effective.

(9) "Initial Rate" means a filed rate or rates applicable to the distribution of electric energy, other than that which proposes to supercede, supplement, cancel or otherwise change the provisions of a tariff rate schedule currently on file with this Commission.

(10) "Kilowatt (KW)" means a measure of electricity defined as a unit of demand or capacity, measured as 1 kilowatt (1,000 watts) of power generated.

(11) "Kilowatt-hour (kWh)" means a measure of electricity defined as a unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour.

(12) "Kilovolt (KV)" means a measure of transmitted electricity measured as 1 kilovolt (1,000 volts) of power transmitted.

(13) "Rate" means the authorized charges, per unit or level of consumption, for a specified time period for any of the classes of distribution licensee services provided to a customer.

(14) "Regulations" means any regulations developed and promulgated by the Commission according to the Bangladesh Energy Regulatory Commission Act, 2003 (Act No 13 of 2003), including subsequent amendments to the Act.

(15) "Schedule" means a statement of the pricing format of electricity distribution or bundled service, and the terms and conditions governing its applications

(16) "Staff" means officers and employees employed at the Commission to assist the Commission in carrying out its investigatory functions.

(17). "Tariff" means a document, approved by the Commission, listing the terms and conditions of service and a schedule of prices, under which licensee services will be provided.

(18) "Terms and Conditions of Service" means a published document included as part of a licensee's tariff that establishes the licensee's terms and conditions for providing service to a customer, discussing such issues as the conditions under which connection will be provided to a customer, metering, disconnection policies, payment instructions, consumer complaints procedures, etc.

#### **4. APPLICATION FORM AND FEES:**

a. An application for the filing of initial, or the changing of current distribution service tariff rate, or the change or initiation of terms and conditions of service for customers, shall be filed with the Bangladesh Energy Regulatory Commission in accordance with this regulation.

b. An application shall be made upon payment of an application fee, which will be fixed by the Commission from time to time. The application fee shall be paid by means of cash demand draft/pay order from a schedule bank in Bangladesh, in the name of the Bangladesh Energy Regulatory Commission.

#### **5. DOCUMENTS TO ACCOMPANY A TARIFF APPLICATION:**

a. The filing of an application for an initial tariff with rates, and terms and conditions of service shall include the following:

(1) A list of documents submitted with the filing;

(2) The date on which service under the proposed schedule is expected to commence;

(3) The names and addresses of those whom the tariff schedule will be mailed;

- (4) A copy of the draft notice announcing the initial rate;
- (5) A brief description of the kinds of services to be furnished and the rates specified therein;
- (6) A summary of the circumstances which show that all requisite agreement to the tariff schedule or to the filing thereof, including any contract embedded therein, has in fact, been obtained;
- (7) Estimates of the transactions and revenues under an initial tariff rate schedule;
  - (i) This shall include estimates by months and for the year, of the quantities of services to be rendered and of the revenues to be derived there from during the twelve months immediately following the month in which those services will commence.
  - (ii) Such estimates should be divided by classes of service, customers, and delivery points and shall show all billing determinants, e.g. KW, KWh, KV supply, fuel adjustment, and power factor adjustment.
- (8) The basis of the rate or charge proposed in an initial rate schedule and an explanation of how the proposed rate or charge was derived;
- (9) A summary statement of all costs (whether fully distributed, incremental or other) computations involved in arriving at the derivation of the level of the rate in sufficient detail to justify the rate, shall be submitted with the filing;
- (10) A comparison of the proposed initial rate with other rates of the filing utility or regulated entity for similar distribution service.
- (11) A copy of relevant power purchase agreements, if any, including detailed terms of service. b. The required documentation, in support of a change to an existing tariff schedule, is as follows:
  - (1) Summary of tariff proposal with historical trend of tariff rate;
  - (2) Justification of tariff changes proposal;
  - (3) Detailed methodology of arriving at the proposed tariff rate;
  - (4) List of person(s) likely to be affected by the changes in the tariff;
    - (i) The current relationship with the person(s);
    - (ii) The relationship that will emerge after the proposed change.
  - (5) A copy of the draft notice announcing the change in tariff or tariff rate.
  - (6) Audited annual accounts for the last consecutive three years;
  - (7) Provisional accounts for the current year at the time of submission;
  - (8) Comparative statement of present and future financial position resulting from changes in tariff;

(9) Details of financial impact if the proposal is not approved;

(10) Financial forecast for the next year at the time of filing of the tariff proposal;

(11) A three year history of system losses;

(12) Any other information which the applicant considers could be useful for evaluating the proposal, including detailed terms of service. c. All accounting codes utilized in the application for an initial rate or change in existing tariff rate schedule shall be consistent with the Commission's uniform system of accounts, as and when published. d. All application filings should provide five copies in printed form and two floppy disks or CD ROMs containing each a copy of the format in an electronic format, preferably Microsoft Word, Excel, and Access.

e. Commission may seek clarification or new information relevant to the proposal after submission of the proposal.

## **6. ACCEPTANCE AND PROCESSING OF APPLICATION:**

a. Acceptance of Application.

(1) The Staff of the Commission has thirty days from the receipt of the application by the Commission Secretary to review and identify any flaws in the application, and any additional information that the Commission may require, in evaluating the application.

(2) The Staff shall establish a data request deadline, not to exceed two weeks, within which the applicant will provide the supplemental information.

(3) The Commission shall not be required to entertain or accept any application until such supporting supplemental data is furnished.

(4) Upon receipt of the required information, the Staff will prepare an entry for acceptance by the Commission, at a regularly scheduled Commission meeting, accepting the application for consideration. That acceptance date becomes the official receipt date for the application.

(5) The fact that the Commission accepts a tariff schedule or any part thereof shall not constitute approval by the Commission of such tariff schedule or part thereof.

(6) The Commission shall not pass an order rejecting the application without giving the applicant an opportunity of being heard or making a written representation.

(7) If the Commission accepts the application, it may give such orders and directions for the service of notices as it deems appropriate to --

(a) all persons affected by, or interested in, the application who in the opinion of the Commission are likely to be affected or interested; and

(b) persons, who, by reason of their calling or expertise, may be of assistance to the Commission in arriving at a just and informed determination on the application.

b. Publication and Service of Notice.

(1) A notice issued on the directions of the Commission may be served through

any one or more of the following modes of service, namely:

- (i) by hand delivery;

(ii) by registered post; or

(iii) by publication in one English language and one Bangla language national daily newspaper, and by advertisement in the electronic media in cases where the Commission is satisfied that it is not reasonably practicable to serve notices in any other manner.

(2) Every notice or process required to be served on, or delivered to, any person may be sent to the person at the address furnished by him for service, or at the place where the person or his agent ordinarily resides or conducts business or personally works for gain. When a person is to be served during the course of the proceedings and such person has authorized in writing an agent or representative to represent him in the proceedings, such agent or representative shall be considered duly authorized to accept service of a notice and process on behalf of the person concerned.

(3) The Commission will issue notice of filing to the public by publication in one English language and one Bangla language national daily newspaper and on the Commission's website.

c. Processing of Application:

(1) The processing of a tariff application shall begin when the application is officially accepted by the Commission and registered with the Secretary of the Commission. A date stamp shall be put on first page of the Application. An appropriate receipt for the application fee shall be prepared and provided to the Applicant.

(2) All paperwork pertaining to a tariff application shall be maintained by the Commission in a separate case file for each applicant. The Commission shall maintain a registration log of all orders issued and this information, including Commission's resolutions, shall be available to the public for review by any interested parties, with exception of the information defined as confidential according to Commission Regulations or written order. Copies of the application, Commission order, and all written testimony and transcripts of oral testimony given in a hearing shall also be filed in this case.

## **7. EVALUATION OF THE APPLICATION:**

a. The Commission shall evaluate the respective application once it has been accepted. The application shall be evaluated in accordance with published Commission tariff methodology.

b. The Commission may perform investigations to collect necessary information, and generally take any measure or action it considers necessary to decide whether or not to approve such an application.

## **8. REJECTION OF APPLICATION:**

a. The Commission may reject an application for reasons that include, but are not limited to, the following:

(1) The enclosed documents to the application do not comply with the requirements of this tariff regulation and/or the applicant has not filed supplemental information pursuant to a request for data from Commission within the required filing deadline, or the application violates other applicable

laws of Bangladesh;

(2) The submitted documents contain materially false information;

(3) The applicant does not have a right to request the tariff change under the Act, this Tariff Regulation and any other Regulations issued by the Commission.

b. The reason for an application rejection by the Commission shall be recorded in writing and provided to the applicant within 30 (thirty) days of the Commission's determination.

#### **9. INTERVENTION, OBJECTION AND HEARING:**

a. The Commission shall, within 60 days of official acceptance of the application, schedule a public hearing at which all parties to the case may present testimony and be cross examined concerning the proposed tariff application. The public hearing shall be in accordance with the Commissions Hearing Regulation.

b. The Staff of the Commission will be required to provide written testimony, and be available for cross examination at the public hearing explaining its analysis of the application and its recommendations for Commission action. Copies of the written testimony will be made available to registered parties to the case, at least one week before the date of the hearing. Similarly, all other parties in addition to the Staff shall provide copies, to all other registered parties and to the Staff, of any written testimony that they wish to file in the case, at least one week before the hearing.

c. Any person seeking to intervene in a rate proceeding or objecting to the tariff application may present his/her motion to intervene and objection by sending a signed original, four (4) print copies to the Secretary of the Commission within fifteen (15) days of publication of notice of acceptance of a tariff application. The motion to intervene and objection must clearly state the name and address of the person seeking intervention and objecting to the application, and the factual grounds for intervention and objection. The objection shall be deemed filed only when it is actually received by the Commission and is accompanied by the required filing fee, which will be fixed by the Commission from time to time. Filing an objection in and of itself does not make a person a party to the proceeding. In order to become a party to a tariff proceeding, a person must file a motion to intervene.

d. The Commission, after review of the motion to intervene, may accept persons as a party to the case. The intervening party's participation in the proceeding will be in accordance with the terms and provisions of the Commission's Hearing Regulations.

e. In the event of the Commission's denial of a motion to intervene, the moving person shall have the right to a motion's hearing, to provide additional bases in support of his motion to intervene in the proceeding. The motion hearing shall be conducted in accordance with the terms and provisions of the Commission's Hearing Regulation.

#### **10. CONTACTS WITH APPLICANT:**

Consistent with the Commission's Public Hearing Regulation, from the time the application for consideration of an initial tariff or a change to an existing tariff is officially accepted by the Commission, until the Commission has made a decision in writing and sent it to the Applicant, all contacts with the Applicant shall be in writing through the Secretary of the Commission, or his designated representative. All contact with the Applicant shall relate only to matters of clarification and additional information, to be provided in writing by the Applicant to the Commission. Any other communications will be considered

prohibited and grounds for dismissal of the proceeding or rejection of the application.

#### **11. DECISION OF THE COMMISSION:**

- a. The Commission shall decide an application within 90 days after its official acceptance and issue a written determination or order, signed or initialed by each Member.
- b. All Commission determinations and orders are final.
- c. Notwithstanding a Commission's final order, a party, within thirty (30) days of the final determination, may petition the Commission for reconsideration. Such petition and the Commission's actions associated therewith are subject to the provisions of the Commission's Hearing Regulation.
- d. Copies of all orders, determinations and decisions made or issued by the Commission, shall be certified under the signature of the Secretary and the seal of the Commission, and shall be made available to any person on payment of such fees as the Commission may, from time to time, determine. Copies of all such orders, determinations and decisions shall be available on the Commission's website or at the principal office at Dhaka for public inspection free of cost.

#### **12. TERM OF TARIFF :**

- a. The tariff shall become effective pursuant to the date specified in the order issued by the Commission.
- b. The Commission determined tariff or rate schedule shall remain in effect until such time as the Licensee shall file for a revision of the tariff, a materially affected party files or the Commission itself initiates a case for revision of the tariff. In the latter case the burden of proof lies with the affected party to show that the current tariff is improper.
- c. In no case shall consideration of a new tariff application be considered within twelve (12) months of the effective date of that initial tariff or rate. The exception would be if an applicant can materially demonstrate that he will endure extreme and undue hardship in absence of revision. The burden of proof of extreme and undue hardship lies with the applicant, and the Commission will not normally consider such a requirement in variance with the Act.

#### **13. NOTIFICATION TO CUSTOMERS OF INITIAL TARIFF OR CHANGE IN TARIFF:**

- a. The applicant shall publish a notice in at least two widely circulated national daily newspapers, one in English and one in Bangla, showing therein the original tariff, and the respective changes. This notification shall be published not later than seven days prior to the date the tariff will be effective.

**By the order of the Commission**

Ghulam Rahman

Chairman

## **Bangladesh Energy Regulatory Commission (BERC)**

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### **ELECTRIC DISTRIBUTION TARIFF METHODOLOGY**

#### **1. INTRODUCTION**

1.1. The purpose of this electric distribution tariff methodology is to establish a standard which will be utilized by a licensee in calculating rates as part of a distribution tariff. By having a regular methodology, a licensee can predetermine the likely outcome of an application for a change in tariffs. Similarly, customers and other interested parties will have confidence in the Commission's examination of the tariffs, that the systems are standardized in a professional manner. Such standardization provides the Commission staff with a reliable basis for examining a tariff application.

1.2. Each distribution licensee shall have published tariff instructions, available to all parties, listing the rates for service, any fixed charges, and appropriate terms and conditions for providing service, termination of service, late payment charges, dispute resolution processes, etc.

1.3. An electric distribution licensee shall have signed wholesale purchase agreements with all suppliers to its distribution system, and signed transmission agreements with any entity that transmits electricity to the interconnection with the distribution company. It will also maintain standardized service agreements that support its provision of service to retail consumers.

1.4. Every customer of a distribution licensee shall receive a detailed bill each month. Among other items the bill shall report the wholesale electric price and the distribution rate for service to its customers, and the total of these two services along with other customer charges as applicable.

#### **2. ENERGY RATE**

2.1. The electric energy rate is the weighted average of all wholesale energy purchases for the billing month on a kilowatt hour basis.

2.2. The distribution licensee does not earn a return or profit on the energy portion of a customer's bill.

2.3. The distribution licensee purchases energy from wholesale suppliers, who pursuant to the generation methodology should semi-annually revise their rates in accordance with changes in fuel costs.

2.4. The distribution company may also directly purchase wholesale electricity from small power producers directly, pursuant to approved Government policy.

2.5. Included in the wholesale energy rate would be the cost of transmission to the distribution company and the transmission losses.

2.6. This total cost is divided by the amount of electricity received to produce an energy billing rate for retail consumers. The customer's energy component portion of the bill is multiplied times this rate to compute the energy cost for the billing period.

2.7. In the case of the single wholesale supplier, then the energy component is

computed as follows:

**Energy Rate = (Wholesale Electric Cost + Transmission Cost + Transmission Loss) / KWH Received**

**Where:**

**Transmission Loss =**

**(% Loss \* Amount KWH Wholesale Electricity Sent \* Wholesale Electric Cost)/KWH Sent**

2.8. The calculation of the energy component of the distribution licensee's customer bills are subject to audit by the BERC.

2.9. The energy component of the customer's bill is independent of the rate case for the purposes of setting the demand rate, customer charges, and miscellaneous charges. The energy component is revised on a semi-annual basis, independently of any rate changes made in the demand rate and the other charges.

### **3. DEMAND RATE**

#### **3.1. Summary**

3.1.1. The rate determined by this procedure should provide the least cost to consumers, and provide the opportunity for the licensee to earn sufficient revenues to cover all of its operating expenses, provide for continuing improvement of its operating system, and attract capital for investment. The rate schedules for the individual customer classes should be designed to be equitable and reasonable to the customers served. Customers receiving like services should be facing the same charges. Differences in charges should be representative of differences in costs. Absolute equality between costs and revenues may be difficult to achieve in the short run. If there are substantial differences in rates between current rates and those developed pursuant to this methodology, individual customers may view the rates as unreasonable. Continuity is important in the design of rates and movement towards this methodology's standards may have to occur over a period of time. Pursuant to the BERC Act, the demand rate and other tariff charges can only be changed once per year.

#### **3.2.2. Test Year**

3.2.2.1. This is a standardized period, which provides a uniform data base for the calculation of rates. The applicant compiles the company data on the basis of this period. The Commission's analysis and decision is based upon the foundation of data produced for the test year.

3.2.2.2. The test year is a twelve month period for which complete data is available. Using this twelve month compilation of data, the Commission staff will review the economic analysis that supports the rate and tariff application to see if it is reasonable. The Commission hereby defines the test year, for the distribution tariff rate applications placed before it, as the most recent fiscal year ending on 30 June. In the case of a distribution applicant with no operating history, then the best estimate for a fiscal year will be considered by the Commission.

### **3.2. Revenue Requirement**

#### **3.2.1. Summary**

.2.1.1. The overall revenue requirement is the amount of income that the distribution licensee should have the opportunity to earn in order to maintain operations and attract capital for investment, but still maintain the least cost for consumers

3.2.1.2. The total annual licensee revenue requirement is the sum of a return on rate base, plus the sum of the total annualized costs of operating the distribution utility.

***Total Licensee Annual Revenue Requirement = Return on Rate Base + Total Costs***

3.2.1.3. The revenue requirement is established through the development of a cost of service.

3.2.1.4. A revenue requirement is developed for each class of service. The sum of the individual revenue requirements must equal the licensee's overall revenue requirement.

### **3.2.2. Cost of Service**

3.2.2.1. The cost of service develops the individual class of service rates (residential, commercial, industrial, agricultural, etc.), on a cost causative basis.

3.2.2.2. For purposes of this methodology, the classes are assumed to consist of Class A – Domestic, Class B – Agriculture, Class C – Small Industry, Class D – Non Residential, Class E – Commercial, Class F – Medium Voltage, Class G – Very High Voltage, Class J – Street Lights and Water Pumps, and Class T – Temporary. These class specifications are not binding upon the distribution licensees. Distribution licensees should propose as part of their rate applications, the customer class configurations and specifications that most appropriately reflects the licensee's distribution requirements. The allocation approaches remain the same regardless of the class number and type.

3.2.2.3. The summation of class revenue requirements equals the overall revenue requirement for the electric distribution licensee.

3.2.2.4. Overall the summation of the distribution company's expenses (including test year depreciation), taxes and a reasonable return on the distribution company's rate base for a given test period and is compared to the income of the company to determine the revenue increase. The revenue increase is the amount of additional revenue needed by the utility to achieve the revenue requirement. Since the revenue increase will also be taxed, to insure that the utility receives the net income necessary to achieve the revenue requirement, the increase is increased to recover the tax effect through a factor termed a "gross up" factor. Once the revenue increase is determined, it is summed with the amount of current revenues to achieve the test year total revenue requirement. This is divided by the distribution throughput of the test year to develop the distribution rate. This overall procedure is followed to develop the individual class rates. The costs, return, and revenues are directly assigned or are allocated to the respective distribution customer classes in order to develop rates for the individual classes.

3.2.2.5. Expenses, incomes, and rates would be based on the embedded costs developed for that test year.

3.2.2.6. All expenses and other financial factors cannot be directly assigned to individual customers classes such as residential or industrial. For that reason, some costs must be allocated on the basis of factors to the respective classes. These may be based on demand related factors, energy related factors, or

customer related factors. A section later in this methodology will discuss specific factors used in allocation.

### 3.2.3. Rate Base

#### 3.2.3.1. Summary

3.2.3.1.1. Overall the rate base for a distribution licensee shall consist of the depreciated used and useful assets; capital or construction work in progress; plus the regulatory working capital.

#### **Total Rate Base = Depreciated Used & Useful Assets + Capital Work In Progress + Regulatory Working Capital**

3.2.2.1.2. The total rate base is the sum of the directly assigned and allocated rate base of the individual customer classes.

### 3.2.3.2 Used and Useful Assets

3.2.3.2.1. The physical asset accounts considered for a distribution utility are broken into three categories – intangible plant, distribution plant, and general plant. Reference for appropriate plant account numbers, definitions, etc. should be made to the BERC uniform system of accounts, when it becomes available.

3.2.3.2.1.1. In summary, intangible plant would consist of organization, franchises and consents, and miscellaneous intangible plant. These plant costs are allocated to the distribution classes on the basis of demand.

Description	Allocator		
	Demand Related	Energy Related	Customer Related
Land and Land rights	x		x
Structures and Improvements	x		x
Station Equipment	x		
Storage Battery Equipment	x		
Poles, Towers, and Fixtures	x		x
Overhead Conductors and Devices	x		x
Underground Conduit	x		x
Underground Conductors and Devices	x		x
Line Transformers			x
Services			x
Meters			x
Installations on Customer Premises			x
Leased Property on Customer Premises			x

3.2.3.2.1.2. Distribution plant will be allocated on the basis of the following chart:

3.2.3.2.1.3. General plant would include land and land rights; structures and improvements; office furniture and equipment; transportation equipment; stores equipment; tools, shop and garage equipment; laboratory equipment; power operated equipment; communication equipment; miscellaneous equipment; and other tangible property. General plant is allocated to the customer classes on the basis of demand and customer related costs.

3.2.3.2.2. As noted in the table above, station equipment and storage battery equipment, if applicable, are allocated to the customer classes on the basis of demand. Referring to the later discussion in this methodology on the demand allocator, the total book value for these plant items will be multiplied by each classes demand allocator and entered into a summary table.

3.2.3.2.3. Services, meters, installations on customer premises, and leased property on customer premises are allocated to the respective rate classes based upon direct assignment to the customer classes, for example, the cost of domestic meters is listed in the summary table under domestic customers. Any other costs which cannot be directly assignable will be multiplied by the customer allocation factors listed later in this methodology and entered into the summary table.

3.2.3.2.4. Plant elements that have both demand and customer related costs will use the minimum size method for dividing the costs between demand and customer. The minimum size method involves determining the minimum size pole, conductor, cable transformer and service currently being installed. The average installed book value for each item is then determined and used to develop the customer component. What is left is the demand portion. For example for overhead conductors, determine the minimum size conductor currently being installed. Multiply the average installed book cost per mile of minimum sized conductors by the circuit miles to determine the customer component. The balance left in the account is demand. In this example, this minimum method may determine that 75% of the overhead conductors are customer related. Then this 75% of the costs should be allocated to the individual customer classes based up the customer allocators. The remaining 25% is allocated based upon the demand allocators. Land and structures should be allocated based upon the average of the other accounts wherein an allocation split was required between demand and customer.

3.2.3.2.5. New assets shall be included in the asset valuation for establishing rates, when they become used and useful, and the value shall be at the original cost – except as discussed below for Capital (Construction) Work In Progress assets.

3.2.3.2.6. Depreciation is a process which distributes the original cost of depreciable assets, adjusted for net salvage value, over the normal useful life of the property in a systematic and rational manner.

3.2.3.2.7. Additions and improvements are charged to the respective distribution plant accounts at original cost. Upon the normal retirement of a distribution plant asset, its original cost is charged against the accumulated depreciation reserve together with the cost of removal less salvage value. The cost of maintenance, repairs, and the replacement of minor items is charged to operating expenses as incurred.

3.2.3.2.8. For purposes of public utility accounting for rate making purposes, the BERC requires that a straight-line depreciation method will be applied for all public utility assets. The useful or standard life of an asset shall be specified in accordance with the International Accounting Standards and such depreciation life schedules as established by the BERC. For purposes of this regulation, straight line depreciation rates are considered acceptable over the following life of equipment and plant:

<i>Depreciation Life</i>	
<b>ITEM</b>	<b>USEFUL LIFE</b>
Buildings	20.0 Years
Plant and Machinery (Sub-station & Lines)	28.6 Years

Motor Vehicle	5.0 Years
Office Equipment	10.0 Years
Signboard – Billboards	4.0 Years
Furniture and Fixtures	10.0 Years

3.2.3.2.9. The amount of the current depreciation will be added as an expense in total costs at the current book value of the assets, and is not subject to re-evaluation based upon any subsequent revision of the asset valuation. Should the distribution utility propose different classes of service, such as firm and interruptible, depreciation will be allocated in the same manner as the assets are allocated to the different classes.

3.2.3.2.10. The allocation of depreciation costs shall be allocated to the customer classes in the same manner as the plant costs themselves are allocated whether based upon demand, customer or a combination.

### **3.2.3.3 . Capital (Construction) Work In Progress**

3.2.3.3.1. Electric capital (construction) work in progress shall be accumulated in specific financial accounts in the same manner as the assets are accumulated. Fundamentally, as work orders are completed for electric distribution plant, under construction, the total of balances for these work orders will be accumulated. Then as the plant is completed and becomes used and useful, the sub-account representing the cost of the construction project shall be deleted from the work in progress capital accounts and the full asset value entered into the plant in service categories. If a project, such as a distribution line is designed to consist of two or more units or circuits, which may be placed in service at different dates, any expenditures which are common to and which will be used in the operation of the project as a whole shall be included in the plant in service accounts, upon the completion and the readiness for service of the first distribution unit. Any expenditure, which is identified exclusively with units of property not yet in service, shall be included in this CWIP account. Records must be maintained to show separately each project. The BERC will only allow CWIP included as an asset value for the purpose of setting rates for the construction of major distribution lines (132 KV and above), and substations.

3.2.3.3.2. In making application for a rate or tariff change, the electric distribution utility must file a schedule which shows the original acquisition cost of the asset, the accumulated depreciation, the net asset value after reduction for depreciation, and the amount of depreciation to be included in the rate application for the test year.

3.2.3.3.3. Capital Work in Progress shall be allocated to the respective customer classes in the same manner as like distribution assets are allocated on a used and useful basis.

### **3.2.3.4 . Regulatory Working Capital**

#### **3.2.3.4.1. Summary**

3.2.3.4.1.1. The last major element of rate base is regulatory working capital. In distribution licensee tariff rate design, "regulatory working capital" has a different meaning than the term "working capital" in normal accounting. Regulatory working capital is a measure of licensee funding of daily operating expenditures and a variety of non-plant investments that are necessary to sustain the ongoing operations of the licensee. Fundamentally, it is the normal

operating funds of a licensee which carry it forward from month to month.

.2.3.4.1.2. It is the sum of the cash working capital, materials and supplies inventory, and any prepayments made, minus the total of customer deposits.

***Distribution Regulatory Working Capital = Cash Working Capital + Materials and Supplies Inventory + Prepayments – Customer Deposits***

3.2.3.4.1.3. Regulatory working capital should be allocated to the respective customer classes on the basis of the total plant allocation allocations. For example, if the sum of the poles, conductors, etc. allocated to the domestic customer class is 70% of the total of all plant accounts then 70% of the regulatory working capital should be assigned to the domestic class.

#### **3.2.3.4.2. Cash working capital**

3.2.3.4.2.1. Cash working capital represents the licensee provided cash required for payment of operation expenses, to maintain compensating cash balances, and similar needs, between the time the expenditures are necessary to provide the services and the time collections are received for the services.

3.2.3.4.2.2. For a licensee, the formula calculates 1/6th (approximately 60 days) of operation and maintenance expenses for one year. For a well managed natural monopoly, this computation represents the average time and amount that the licensee must provide cash for operations before collections are received from the service.

***Cash Working Capital = 1/6 x (Annual Operation & Maintenance Expenses)***

#### **3.2.3.4.3. Materials and supplies inventory**

3.2.3.4.3.1. Materials and supplies are the licensee's inventory value for material and supplies necessary to meet daily requirements of providing service.

3.2.3.4.3.2. A 12-month average for the test year is used.

***Materials and Supplies Inventory = (Total of 12 Months Value Materials and Supplies) / 12***

3.2.3.4.3.3. Materials and supplies are allocated to the respective customer classes on the basis of demand and customer related costs.

#### **3.2.3.4.4. Prepayments**

3.2.3.4.4.1. Prepayments are made in advance of the period to which they apply and include items such as prepaid rents, insurance, and taxes. The amounts normally allowed are based on the same standards outlined above for M&S inventories.

3.2.3.4.4.2. The average monthly measurement period should encompass more than a single test year review, since certain pre-paid expenses (such as prepaid insurance) often are made for periods in excess of one year. Sum the prepaid balances over whatever the longest cycle of any individual component of the prepayment item, and then average it for the test year period. For example, if during the test year, insurance was prepaid for three years, then divide the total by three, and for Tariff Rate purposes enter this amount for the annual prepayment amount. Divide this by twelve months to develop a monthly average value for prepayments to be included in working capital.

.2.3.4.4.3. Advanced income tax is a prepayment included in regulatory working capital. Advanced Income Tax is charged at the rate of 2.5% of the invoice value of the imported item, and also paid each quarter to the Government on the basis of regularly adjusted quarterly estimates. For regulatory working capital purposes, the

licensee can receive a return on a portion of the advance income tax paid. The licensee shall divide advance income tax paid during the test year by 12 months to develop an amount that is included in regulatory working capital.

#### **3.2.3.4.5. Customer Deposits**

3.2.3.4.5.1. Customer deposits are normally required for a distribution licensee to provide service. These represent insurance for the licensee against the customer defaulting on payment. Distribution licensees utilize these deposits in daily meeting of working capital requirements. Thus for purposes of calculating return on working capital, since these funds are not funds provided by the licensee, these should be subtracted from the working capital total. If the distribution licensee pays interest on the funds deposited, these interest costs are treated as an expense.

#### **3.2.4. Rate of Return on Assets**

##### **3.2.4.1. Summary**

3.2.4.1.1. The distribution rate of return on qualifying assets shall be calculated as the weighted average cost of capital in accordance with the following formula:

**Average Cost of Capital = [(Equity Capital x E%) + (Debt Capital x D %)]**

**[(Equity Capital + Debt Capital)]**

where:

“E%” is a rate of return on the equity capital of the company, which is computed as described in the following section.

“D%” is a calculated weighted value of interest rate for debt capital, which is computed as described in the section following the discussion on return on equity.

3.2.4.1.2. The same rate of return shall be used for each customer class as is utilized for the overall company – that is, equalized rates of return will be utilized overall classes.

##### **3.2.4.2. Return on Equity**

**E% = [(Common Stock Amount x Dividend Rate) + (Remaining Equity Amount x Non-Stock Rate)]**

**[(Common Stock Amount + Remaining Equity Amount)]**

3.2.4.2.1. In the case of common stock, the amount of common stock outstanding during the test year is multiplied by the last dividend rate paid during the test year.

3.2.4.2.2. In terms of the remaining equity existing within the distribution

licensee, if government owned, then the government's borrowing rate is utilized.

3.2.4.2.3. In the case of licensees, which are wholly or partially owned by the government, the cost of capital for remaining equity would equal the government's cost of capital. For purposes of rate development, the most recent treasury bill auction rate, pursuant to central bank auction, for the two-year Bangladesh treasury bills shall be utilized.

3.2.4.2.4. If the licensee is a privately held distribution company that falls under the regulation of the BERC, then the remaining equity rate can be computed on the basis of the following discussions.

3.2.4.2.5. The Commission's preference in determining the return on equity is a form of a capital asset pricing model (CAPM.). It assumes that the cost of equity is the sum of a risk-free rate of return, plus a return to compensate investors for market risk. This is commonly termed a Beta. A Beta represents the extent with which a stock's return moves with overall market returns. A licensee stock's historical returns are compared to the returns of the market and a measure of risk determined.

3.2.4.2.6. It is the responsibility of the licensee applying for a tariff rate change to recommend a rate of return on equity, and provide adequate support to justify that equity rate. The Commission upon review will determine that equity rate pursuant to a Commission staff analysis and the review of all evidence in the public hearing.

3.2.4.2.7. Other methods for determining a return on equity are the discounted cash flow, risk premium approach, and comparable earnings approach.

3.2.4.2.7.1. The discounted cash flow assumes that the price of a stock is the present value of the income to be received from it in the future. The difficulty in utilizing this method is trying to assign a value to investor expectations. If the licensee stock is not publicly traded, or newly traded, it becomes a very subjective decision.

3.2.4.2.7. 2. The risk premium method is also common. It assumes that equity has a required rate of return higher than debt. The cost of equity is the long-term cost of debt, plus a risk premium. The determination of the risk premium is again based upon historical stock records.

3.2.4.2.7. 3. The comparable earnings approach takes a sample group of other licensees and develops a composite rate of equity return to be proposed for the licensee. Again records of similar equity rate proceedings and the results are required.

3.2.4.2.8. The Commission will consider tariff applications with all of these approaches, but prefers a method similar to the Capital Asset Pricing Model (CAPM), with a risk free rate of return plus an additional factor for market risk. The burden of proof with regard to establishing the rate of return remains with the licensee.

3.2.4.2.9. It is the responsibility of the distribution licensee applying for a rate change to recommend a rate of return on the non-stock equity, and provide adequate support to justify that rate. The Commission upon review will determine that rate pursuant to Commission staff analysis and the review of all evidence in the public hearing. Absent a qualified and approved recommendation by the distribution utility, for a partially government-owned licensee, the Commission will only accept the most recent treasury bill auction rate for two year notes that has occurred during the fiscal test year. If no auction has occurred during the test year, then the rate that existed at the last such auction prior to the test year will be utilized.

### 3.2.4.3. Return on Debt

**$D\% = [(Long\ Term\ Debt \times Debt\ Rate) + (Preferred\ Stock\ Amount \times Dividend\ Rate)]$**

**$[(Long\ Term\ Debt + Preferred\ Stock\ Amount)]$**

3.2.4.3.1. If there are multiple long term debt instruments at different interest rates, or multiple issuance of preferred stock at different dividend rates exist, then a similar weighted cost calculation would be performed for each category.

3.2.4.3.2. In terms of long term debt rate, the utilities that are wholly owned government entities shall use the loan rate applied by the government of Bangladesh, even if the loan funds derive from donor loans at a lower rate.

3.2.4.3.3. The loan amounts used in this calculation should represent the outstanding balance (or unpaid balance) of the loan – not the original loan amount.

3.2.4.3.4. The applicant utility must provide a long term debt summary, which indicated the original amount of the long term debt by source, amount, and date; the accumulated principal reduction; the time period during the test year wherein the loan was applicable; the interest rate; the amount of interest paid during the test year; the amount of principal paid during the test year; and the amount of interest paid during the preceding fiscal year.

### 3.2.4.4 . Overall Rate of Return

3.2.4.4.1. The fundamental formula for computing the rate of return, as shown in the generic section of this regulation, would be applicable for an independently owned or a government owned distribution company:

**$AC = [(Equity\ Capital \times E\%) + (Debt\ Capital \times D\%)]$**

**$[(Equity\ Capital + Debt\ Capital)]$**

3.2.4.4.2. This rate of return should provide the distribution utility with the opportunity to earn a return on the investment in the company which is reasonable based upon its obligations for long term debts and its ability to raise capital.

3.2.4.4.3. The rate of return calculated through this procedure will be used on a levelized basis across all of the rate classes, that is, the same rate will be multiplied times each classes asset values to determine that classes return on assets.

### 3.2.5. Total Costs

#### 3.2.5.1. Summary

3.2.5.1.1. Total Costs are the sum of costs associated with the operation and maintenance (O&M) of the licensee's system, the straight-line depreciation costs of used and useful assets used for distribution for the Tariff Rate year, taxes, and any other necessary costs related to the operation of the licensee's system.

***Total Costs = O&M Costs + Depreciation + Income & Other Taxes***

3.2.5.1.2. Costs should be formulated in accordance with Bangladesh Accounting Standard and the Uniform System of Accounts, when published by the Commission.

3.2.5.1.3. Calculations of costs for each tariff application shall be based on the analysis of twelve months of actual data.

3.2.5.1.4. For the purpose of tariff calculation, all costs shall be detailed as much as possible in order to allow proper controls by the Commission.

3.2.5.1.5. O & M costs are the expenses incurred in a business arising from or directly related to producing the service as well as the costs of maintaining the system in service. If the distribution licensee pays interest on the customer deposits that it carries on its books, this interest should be treated as an O&M expense.

3.2.5.1.6. Any expenditure, which is identified exclusively with units of property not yet in service, shall be included in the CWIP account. Records must be maintained to show separately each CWIP project.

3.2.5.1.7. The amount of the current depreciation will be added as an expense in total costs at the current book value of the assets, and is not subject to re-evaluation based upon any subsequent revision of the asset valuation.

3.2.5.1.8. The taxes included as part of the cost of service include all applicable taxes. They are added as an expense.

3.2.5.1.9. These costs are allocated to individual customer classes as discussed below.

### **3.2.5.2. Operation and Maintenance Expenses**

3.2.5.2.1. Operation and Maintenance (O & M) costs are the expenses incurred in a business arising from or directly related to producing the service as well as the costs of maintaining the system in service.

3.2.5.2.2. O&M expenses for distribution utilities are broken into the major categories of distribution, customer accounts, sales, and administrative and general expense. A chart following the discussion of the expenses lists the allocation factors applied to the various expenses for purpose of assignment to the individual classes of service.

#### **3.2.5.2.2.1. Distribution Expenses**

Distribution expenses are broken into two major categories – operations and maintenance. In terms of operations expenses costs are broken into operation supervision and engineering; load dispatching; station; overhead line; and underground line, meters, customer installation expenses miscellaneous distribution expenses, and rents. Maintenance expenses include maintenance supervision and engineering; structures; station equipment; overhead lines; underground lines; line transformers, meters and miscellaneous distribution plant.

These costs are allocated to the respective customer classes in accordance with the table listed below.

#### **3.2.5.2.2.2 . Customer Accounts Expenses**

Customer Accounts Expenses are considered operations expenses only. They

include supervision, meter reading, customer records and collection; uncollectible accounts; and miscellaneous customer accounts expenses.

These costs are allocated to the respective customer classes on the basis of the customer allocation ratios.

### 3.2.5.2.2.3. . Sales Expenses

Sales Expenses are considered operations expenses only. They include supervision, selling, advertising, and miscellaneous sales expenses.

These costs are allocated to the respective customer classes on the basis of the customer allocation ratios.

### 3.2.5.2.2.4 . Administrative and General Expenses

Administrative and General Expenses are broken into operation and maintenance expenses, with the bulk of the expenses being operation based. Operation expenses include administrative and general salaries; office supplies and expenses; administrative expenses transferred; outside services; property insurance; injuries and damages; employee pensions and benefits; franchise requirements; regulatory commission license fees; duplicate charges; miscellaneous general expenses; and rents. Maintenance expenses include only maintenance of general plant.

3.2.5.2.3. These costs are allocated to the respective customer classes on the basis of the customer and demand allocation ratios.

Description	Allocator		
	Demand Related	Energy Related	Customer Related
<b>Operations</b>			
Operation Supervision and Engineering		x	
Load Dispatching	x		
Station Expenses	x		
Overhead Line Expenses	x	x	
Underground Line Expenses	x	x	
Meter Expenses			x
Customer Installation Expenses			x
Miscellaneous Distribution Expenses	x		x
Rents	x		x
<b>Maintenance</b>			
Maintenance Supervision and Engineering	x		x
Maintenance of Structures	x		x
Maintenance of Station Equipment	x		
Maintenance of Overhead Lines	x		x
Maintenance of Underground Lines	x		x
Maintenance of Line Transformers	x		x
Maintenance of Meters			x
Maintenance of Miscellaneous Distribution Plants			
<b>Customer Accounts</b>			
Customer Expenses			x
Sales Promotion			x
<b>Administrative and General Expenses</b>	x		x

3.2.5.2.4. Where items listed in the table above have joint allocators such as demand and customer, the allocation factors should mirror the related plant allocation. In the case of such factors as supervision which are both demand and energy related, then time studies should be performed of the labor costs employed and the respective costs allocated to the classes on the basis of demand and energy allocations.

3.2.5.2.5. Expenses used in the calculation of a monthly customer charge or other miscellaneous charge should not be included in the class total operation and maintenance expenses.

#### **3.2.5.2.6 . Foreign Currency Exchange Fluctuation**

3.2.5.2.6 .1 . Given that Bangladesh utilities have dollar denominated, or other international currency denominated, loans from international banking institutions such as the Asian Development Bank, a utility incurs revenue loss as a result of the devaluation of the Taka in comparison to the U.S. dollar or another international denominated currency, to the extent that revenues used to repay the loans are

obtained from the local economy. Although debt related, this amount should be treated as an expense, which should be computed based upon the current exchange rate at the end of the fiscal year minus the exchange rate at the beginning of the fiscal year multiplied times the dollar amount of loan repaid during the fiscal year. This will be included as an administrative and general expense.

3.2.5.2.6 .2 . The exchange rate difference of materials and equipment which has already entered the distribution company's possession cannot be reassessed and an exchange rate fluctuation calculated for that material or equipment already in the distribution company's possession can not be considered for rate development purposes.

3.2.5.2.6 .3 . The allocation of currency fluctuation expenses should be performed on the basis of demand allocation.

#### **3.2.5.3. Depreciation**

3.2.5.3.1. The amount of depreciation included as a cost is the total annual depreciation for all used and useful assets for the test year.

3.2.5.3.2. It is allocated to the respective customer classes on the percentage basis of the individual plant accounts.

#### **3.2.5.4. Income and Other Taxes**

3.2.5.4.1. A licensee's taxes are an expense that should be recoverable as a business cost in providing regulated service.

3.2.5.4.2. Three taxes directly affect a distribution licensee's operations in Bangladesh – value added tax (VAT), land tax, and income tax.

3.2.5.4.2.1. To the extent that licensee makes payroll or invoice deductions from employee or contractor payments, for payment to the government, these are not included in the licensee's cost of service for tariff rate design purposes. To the extent that the licensee provides matching payments to these deductions above the amount collected, then these are booked as an expense as part of the cost of service. If the licensee makes any other tax payments not already

discussed in this methodology that has a direct result on the distribution of electricity, then these are booked as an expense as part of the cost of service.

3.2.5.4.2.2. Value Added Tax (VAT) is only collected at the distribution level and not collected on distribution services.

3.2.5.4.2.3. Land tax is not directly affected by the amount of distribution and generally is booked as a miscellaneous cost.

3.2.5.4.2.4. Income tax is charged as follows: (1) for a company which is not publicly traded, the rate is 40%; (2) a publicly traded company has a rate of 30%; and (3) a Bank/Insurance/Financial firm has a rate of 45%. The distribution licensee, for income tax purposes will fall under either category (1) or (2), and must support in the rate case filing, the rate being applied by the tax department.

3.2.5.4.3. At the time of importing materials to Bangladesh, the licensee pays a VAT, a Customs Duty, and Advanced Income Tax. Advanced Income Tax is charged at the rate of 2.5% of the invoice value of the imported item

3.2.5.4.4. For imported materials, the VAT and Customs Duty charged are a part of the acquisition cost of the asset or material, and should be included when booking the asset or material as part of its acquisition value. That amount will be used for purposes of depreciation and for computing a return on assets.

3.2.5.4.5. If the licensee pays VAT on any item it purchases, it is included in the book cost of that asset or item as part of the acquisition cost of the item for Tariff Rate design purposes.

3.2.5.4.6. In addition to the advance income tax collected on import of materials, the licensee will pay estimated advance income tax to the Government on a quarterly basis. The licensee will make an estimate of taxes for the fiscal year. The licensee has an obligation to pay in advance payments at least 75% of the estimated taxes. Each quarter, the licensee then adjusts the estimate for the new quarter based upon actual revenues and tax liability for the past quarter. At the end of the fiscal year, the income tax payable is netted against the advanced income tax, paid via quarterly payments as well as per the advance income tax collected upon import of materials, and the net payable income tax is submitted to the government. If the accumulated advance income tax exceeds the amount of income tax owed to the government for that fiscal year, then no additional income tax is paid, and any surplus advance income tax is carried forward on the books into the next fiscal period. Advanced income tax is a prepayment and a portion should be included in regulatory working capital.

3.2.5.4.7. The amount of income tax to be included as a cost expense for tariff rate design during the test year is the actual amount of income tax paid to the Bangladesh government as booked for the test year.

3.2.5.4.8. The taxes included for tariff rate design purposes within a test year are:

***Taxes = Land Tax + Income Taxes Paid***

3.2.5.4.9. Taxes are allocated to the respective classes on the basis of revenues. If the domestic class produces 70% of the revenues, then 70% of the taxes should be allocated to the domestic class.

### **3.2.6. Recommended Operating Revenues**

3.2.6.1. The overall recommended operating revenues would be the sum of the

proposed return on rate base plus the total operating expenses which include the current year depreciation, and taxes.

**Recommended Operating Revenue = Proposed Return on Rate Base + Operating Expenses**

3.2.6.2. This amount needs to be compared to the current operating revenues to determine the amount of the increase that will need to be obtained to allow the distribution licensee to receive the revenue requirement.

3.2.6.3. This calculation is performed for each customer class and the sum of the customer class recommended operating revenue must equal the overall revenue requirement. Minor mathematical difference may arise, and any differences should be distributed among the customer classes in proportion to the already calculated class operating revenue.

### **3.2.7. Total Current Operating Revenues**

3.2.7.1. The total current operating revenues would be the sum of distribution service revenues, income from other services rendered, any interest income, and any miscellaneous income.

**Total Current Operating Revenues = Distribution + Other Service + Interest + Miscellaneous**

3.2.7.2. Miscellaneous income would include revenue from customer charges, reconnection charges, etc.

3.2.7.3. Current revenues for individual distribution classes are developed based upon actual book revenues.

### **3.2.8. Proposed Revenue Increase**

3.2.8.1. The proposed revenue increase is the difference between the current revenues and the recommended operating revenues. This difference is the amount of revenue that rates would need to be increased to provide the licensee with the opportunity to achieve the recommended rate of return and receive sufficient funds to cover operating expenses.

3.2.8.2. Each class revenue increase is computed in the same manner as the overall increase.

**Proposed Revenue Increase = Recommended Operating Revenues - Current Revenues**

3.2.8.3. However, this proposed revenue increase is going to be subject to income tax. If this proposed increase is directly added to current revenues, then the licensee after implementing the increase would not receive the recommended operating revenues. Future revenues would be reduced by the amount of the increased taxes. Thus, to insure the licensee receives the revenues recommended, the amount of the increase is "grossed up". Essentially, the increase is enlarged to allow for the increased taxation. A revenue conversion factor is developed which is multiplied times the increase.

3.2.8.3.1. The revenue conversion factor is calculated by computing a formula. The formula is the number "1" divided by the number "1 minus the effective income tax rate".

**Revenue Conversion Factor = 1/(1- Income Tax Rate)**

3.2.8.4. Once the conversion factor has been developed, the amount of the increase is multiplied times the proposed revenue increase to develop a recommended revenue increase.

**Recommended Revenue Increase = Proposed Revenue Increase \* Revenue Conversion Factor**

3.2.8.5. Each class recommended revenue increase is treated in the same manner as the overall calculation.

### **3.2.9. Total Recommended Revenue Requirement**

3.2.9.1. The total recommended revenue requirement is the sum of the current revenues plus the recommended revenue increase.

**Recommended Revenue Requirement = Total Current Revenues + Recommended Revenue Increase**

3.2.9.2. This is computed for each class and must equal the overall licensee recommended revenue requirement.

### **3.3. Distribution Rate**

3.3.1. The distribution rate for each class is simply computed by dividing the recommended revenue requirement by the annual distribution throughput in kilowatt hours for each class.

**Distribution Rate = Recommended Revenue Requirement/Annual Distribution Throughput**

3.3.2. As distribution services evolve in Bangladesh establishing such services as firm and interruptible services, etc, the BERC will address these changes on a case by case basis and amend this methodology as needed.

## **4. Miscellaneous Charges**

### **4.1. Summary**

4.1.1. Electric Distribution Licensees may have need of establishing a number of miscellaneous charges to satisfy particular requirements needed to serve a customer class. This could include reconnection charges, late payment charges, specialized meter or distribution charges, etc.

4.1.2. The individual distribution licensee in making a rate application should indicate the miscellaneous charges it proposes to levy on its customers, and provide complete working papers which justify the costs utilized to compute the charge. Any plant or any expense used to calculate such a rate does not get included again in the calculation of the distribution rate for electricity. The revenues received from miscellaneous charges will be included in satisfying the overall revenue requirement..

### **4.2. Customer Charge**

4.2.1. A significant miscellaneous charge is the customer charge. Costs occur as a result of customers being connected to the licensee's system, regardless of usage. Such costs should be represented in the design or structure of rates. The BERC's methodology herein describes a calculation for the establishment of a domestic customer flat charge. The licensee should also propose similar calculations which support customer charges for the other customer classes, to

include variations within a class for different phase levels, such as single or three phase.

#### **4.2.1.1. Domestic Flat Customer Charge**

4.2.1.1.1. The BERC calculation procedure for the establishment of the domestic flat customer charge would be as follows.

4.2.1.1.2. Using accounting records, the licensee identifies the plant accounts for services and for meters that are specifically identifiable for use in servicing the domestic class.

***Domestic Services Costs + Domestic Meter Costs = Domestic Related Customer Charge***

#### **Plant Costs**

4.2.1.1.3. Then from accounting records again, the licensee compiles the expense records for meters, customer installations, maintenance of meters, supervision of customer accounting, meter reading, customer records and collection, supervision of customer records and collection, customer assistance.

Expenses:

***Meter + Installation + Meter Maint. + Cust. Acct. Supervision + Meter Reading + Cust. Collection + Supervision Cust. Collection + Customer Assistance = Customer Expenses***

4.2.1.1.4. The customer plant costs are then multiplied by appropriate carrying costs.

***Domestic Related Customer Charge Plant Accounts \* Carrying Cost = Carrying Costs on Plant***

4.2.1.1.5. The carrying cost is added to the expenses to develop the total customer charge cost for the year.

***Carrying Costs on Plant + Customer Expenses = Customer Charge Cost for Year***

4.2.1.1.6. To develop the monthly customer charge for flat domestic service, the customer charge cost for a year is then divided by the total number of domestic customer bills for the year. The number of customer bills is computed by multiplying the average number of customer during the year by 12.

***(Customer Charge Cost for Year)/(Number of Customer Bills) = Monthly Customer Charge***

## **ANNEX A**

### **CLASS ALLOCATION**

## I. Demand Allocation

A. One of the most important allocations among the classes is the allocation of demand-related costs, which are costs related to the peak usage of electric power on the distribution system. Peak requirements directly relate to the physical capacity of the system and are a primary design factor.

B. Numerous procedures exist to allocate demand requirements, with the most common being a peak responsibility method, an average of maximum demands, and the use of noncoincident demands.

C. The peak responsibility method essentially assigns most of the costs to the customer classes that place the highest demands upon the distribution system under its maximum peak load condition. If only two classes existed, one might cause 10% of the peak load and the other cause 90%. Then, 10% of the demand costs would then be assigned to the first class and 90% to the other.

D. The average of maximum demands would take a peak month, for example, a summer month like August is chosen and the class peak for that month is divided by the total peak for that month; then a winter month like December could be chosen and a similar calculation is performed for each class. Then the two months' values are added together and divided by two for each class. Thus one class may cause 20% of the peak load in August and 10% of the peak load in December. Its average peak load is 15%. The other class may cause an 80% load in August and a 90% load in December. Its average is 85%. Then under this procedure 15% of the demand-related costs would be allocated to the first class and 85% to the second class. This could be calculated for more than two months or for all 12 months if desired. A twelve-month weighted average is derived as the sum of the monthly demands divided by the sum of the monthly total demands.

E. The Noncoincident approach uses the maximum demand of each class may have a maximum demand which may not coincide with the distribution system's maximum demand. For example the class consumption may peak in December while the system peak may be in August. The peak for each class is added to produce a total of noncoincident peaks. Then each class peak is divided by this total. For example, one class has a peak in December of 500, and the other has peak of 3000 in August. The sum of the two noncoincident peaks is 3500. Dividing each class by this total produces 14.3% for the first and 85.7% for the second class. These two percentages would be multiplied times the total demand-related costs and allocated to those respective classes. The sum of the noncoincident peaks will not necessarily equal the coincident peak for the distribution licensee, for example, the coincident peak may have occurred in September and amount to 3300.

F. For purposes of this methodology, the BERC prefers a coincident peak using two seasons – Summer and Winter. The nature of electrical generation in Bangladesh has two significant seasonal changes, which are affected by the air conditioning load in the Summer and the agricultural load in the Winter, especially the January to March period. The BERC will consider other demand allocation approaches which individual distribution licensees propose which have adequate documentation to indicate that a different approach is more appropriate for the that respective licensee's operations.

1. Under this methodology, the licensee will determine the month showing the highest peak demand for the distribution licensee during the Summer, which will consist of the months April through September. During the peak period the licensee will determine the percentage of load, from its meter readings, that each customer class places on the system. The same procedure will be followed for the Winter. The two rates will be averaged, and wherever demand allocation

is performed the percentage of each class average will be used - to be multiplied times the total amount of the plant and expense accounts being allocated to each class.

## II. Energy Allocation

A. The energy allocator is computed based upon accounting records for the amount of energy consumed by the respective classes. For example, if the domestic class consumes 40% of the energy in the test year, and the agriculture class consumes 10%, then any plant or expense allocation on the basis of energy would be multiplied by 0.4 and 0.1 respectively.

## III. Customer Allocation

A. The customer allocator is computed based upon accounting records which list the average number of customers during the test year for each class. For example, if the total number of customers were 10,000 served by the licensee - and 8,500 were domestic customers; 1,000 were industrial customers; and 500 were agricultural customers – then, any plant or expense cost allocated by customers would allocate 85% to domestic, 10 % to industrial, and 5% to agriculture.

## IV. Revenue Allocation

A. The revenue allocation is computed based upon accounting records which indicate the revenues received from each respective class as a percentage of the total revenue. Any plant or expense allocated would be multiplied times these percentages.

## ANNEX A

A simple summary table of a cost of service follows. This provides an executive summary of how the cost of service produces the final recommendation. More detailed information will follow, which provides the input elements for the factors used in this sample table. Only two classes of service were used in this sample calculation. For a distribution company, with numerous classes and with sub classifications within a class such as based upon phase, then those subcategories would also be allocated costs of the same basis as discussed. The identification of the classes in this table as Class A and Class B bears no relationship with the normal class identifications in Bangladesh .

<b>Sample Summary of Cost of Service</b>				
<b>1. RATE BASE</b>	<b>Total Company</b>	<b>Class A</b>	<b>Class B</b>	<b>Allocation</b>
Distribution Assets In Service	50,000,000,000	35,000,000,000	15,000,000,000	D,C
Capital (Construction) Work In Progress	2,000,000,000	1,400,000,000	600,000,000	D, C
Regulatory Working Capital	750,000,000	525,000,000	225,000,000	D,C
Accumulated Depreciation	- 20,000,000,000	- 14,000,000,000	-6,000,000,000	D,C,TP
<b>TOTAL RATE BASE</b>	<b>32,750,000,000</b>	<b>22,925,000,000</b>	<b>9,825,000,000</b>	

<b>2. Proposed Rate of Return (decimal)</b>	0.1	0.1	0.1	
3. Proposed Return on Rate Base	3,275,000,000	2,292,500,000	982,500,000	
<b>4. OPERATING EXPENSES</b>				
Total Operation and Maintenance	2,000,000,000	1,800,000,000	200,000,000	D,E,C,TP
Depreciation (Test Year)	2,000,000,000	1,400,000,000	600,000,000	D,C
Taxes Other Than Income	100,000	60,000	40,000	R
Total Operating Expenses Before Income Tax	4,000,100,000	3,200,060,000	800,040,000	
Income Tax (37.5%)	19,035,000	11,421,000	7,614,000	A
<b>TOTAL OPERATING EXPENSES</b>	4,019,135,000	3,211,481,000	807,654,000	
<b>5. RECOMMENDED OPERATING REVENUE</b>	7,294,135,000	5,503,981,000	1,790,154,000	
<b>6. CURRENT OPERATING REVENUES</b>				
Distribution Service Sales	4,000,000,000	2,400,000,000	1,600,000,000	A
Income from Services Rendered	60,000	0	60,000	A
Interest Income	50,000,000	30,000,000	20,000,000	A
Miscellaneous Revenue	800,000	700,000	100,000	A
<b>TOTAL CURRENT OPERATING REVENUES</b>	4,050,860,000	2,430,700,000	1,620,160,000	
<b>7. PROPOSED REVENUE INCREASE</b>	3,243,275,000	3,073,281,000	169,994,000	
<b>8. REVENUE CONVERSION FACTOR</b>	1.6	1.6	1.6	
<b>9. RECOMMENDED REVENUE INCREASE</b>	5,189,240,000	4,917,249,600	271,990,400	

<b>10. TOTAL RECOMMENDED REVENUE REQUIREMENT</b>	9,240,100,000	7,347,949,600	1,892,150,400	
<b>11. DISTRIBUTION THROUGHPUT (KWH)</b>	20,000,000,000	18,000,000,000	2,000,000,000	A
<b>PROPOSED DISTRIBUTION RATE (Taka per KWH)</b>		0.4082	0.9460752	

Allocation Factor:

D = Demand

E = Energy

C = Customer

R = Revenue

TP = Total Plant

A = Assigned

#### Simple Explanation of Calculation

##### Step 1

In terms of this example, the assets of the company are accumulated – the original costs of the physical assets, the capital (construction) work in progress, and the regulatory working capital. The total of these assets are allocated to the respective customer classes based upon the allocation factors discussed in the text.

From that the accumulated depreciation of the physical assets is deducted. It allocated to the individual classes as discussed in the text.

Thus the remaining value included in this asset amount is the net book value of the physical assets. For each class and in total, this accumulation of assets becomes the calculation basis for computing a return on assets. More detailed discussions of what should be included in assets are prescribed elsewhere in this regulation.

##### Step 2

For this example, an arbitrary rate of return was selected. For purposes of rate design, in a regulatory case, the rate of return on rate base is the result of an exhaustive financial and economic analysis. The ultimate rates produced by the application of this return should as fair as possible for the customers – producing the lowest cost possible within the accounting and economic criteria developed in this rate case process. The development of the rate of return is addressed much more extensively elsewhere in this regulation. The rate of

return calculated for the total company is applied uniformly across all of the classes, that is, no single class has its own rate of return.

### Step 3

The sum of the assets, less accumulated depreciation, is then multiplied times the rate of return from Step 2. This results in a proposed return on qualifying rate base. It is the earnings allowable to the utility based upon its investment in assets. This calculation is performed in total and for each class. The results for each class should sum to the company overall total.

### Step 4

The expenses are then accumulated. In addition to normal operation and maintenance expenses, taxes are included. Income taxes are included because this is an expense to the company as is any other operating expense. One of the purposes of this cost of service analysis is to produce rates that cover all expenses and to provide operating funding above expense which can be used to expand the system and provide capital for investors to continue to fund the operations. As discussed in the text, the expenses are allocated to customer classes on a combination of factors depending upon the nature of the expense. The expenses are summed for each class as well as in total.

### Step 5

The recommended operating revenues are then computed by adding the return on rate base computed in step 3 plus the sum of the operating expenses computed in step 4. This is the amount of revenue that the utility should be receiving today. This same calculation is performed for each class and thereby establishes the operating revenue required for each class.

### Step 6

In step 6, all of the current revenues are summed, in total and by class.

### Step 7

In step 7, the current revenues computed in step 6 are subtracted from the recommended revenues computed in step 5. This is performed in total and for each class. This difference is the amount that current revenues need to increase in order to achieve the recommended revenues.

### Step 8

In step 8, a revenue conversion factor is computed. This is a formula which is computed as the number "1" divided by the number "1" minus the effective income tax rate. In this example, it is  $1/(1-0.375)$ , which equals 1.6 – with the income tax rate set at 37.5%. The reason that this is computed is that the revenue increase computed in step 7, if received as part of earnings, would also be charged income taxes. Therefore the utility would not receive the recommended revenue increase after taxes. So the revenue needs to be "grossed up", so the net revenue received after taxes equals the amount of revenue increase recommended.

### Step 9

In step 9, the proposed revenue increase from step 7 is multiplied by the revenue conversion factor computed in step 8. The overall licensee revenue conversion factor is applied to each of the classes uniformly.

### Step 10

In step 10, the current revenues from step 6 are added to the proposed revenue increase from step 9, and this produces the total revenue requirement. This is the total amount of revenue that the distribution company should receive from the rates it charges to cover all expenses and provide a return on assets. This calculation is performed for each class, and the sum of the class totals must equal the licensee total.

### Step 11

In step 11, the utility lists the total amount of annual throughput in KWH that occurs on its distribution lines. From the licensee's billing records the amount of electricity consumed by each class is listed in the respective column for each class. The licensee overall total shall be the sum of the individual class totals for the test year.

### Step 12

In step 12, the revenue requirement computed in step 10 is divided by the throughput from step 11 for each class, and this produces a rate per KWH for each class that the distribution utility should charge its customers. An overall company rate would not be applicable to calculate.

## ANNEX B

A just and reasonable electricity distribution tariff rate is calculated using the following summary. For details in applying these formulas, please review the text of the methodology. With the exception of the rate of return, the formulas below are applicable to both individual classes and the overall licensee calculation. Rate of return is only developed for the overall licensee and uniformly applied to each customer class.

**Energy Rate = (Wholesale Electric Cost + Transmission Cost + Transmission Loss) / KWH Received**

**Where:**

**Transmission Loss =**

**(% Loss \* Amount KWH Wholesale Electricity Sent \* Wholesale Electric Cost) / KWH Sent**

**Total Annual Revenue Requirement = Return on Rate Base + Total Costs**

**Rate Base = Depreciated Used & Useful Assets + Capital Work In Progress + Regulatory Working Capital**

**Distribution Regulatory Working Capital = Cash Working Capital + Materials and Supplies Inventory + Prepayments – Customer Deposits**

**Cash Working Capital = 1/6 x (Annual Operation & Maintenance Expenses)**

**Materials and Supplies Inventory = (Total of 12 Months Value Materials and Supplies) / 12**

**Average Cost of Capital = [(Equity Capital x E%) + (Debt Capital x D %)]**

**[(Equity Capital + Debt Capital)]**

**E% = [(Common Stock Amount x Dividend Rate) + (Remaining Equity Amount x Non-Stock Rate)]**

**[(Common Stock Amount + Remaining Equity Amount)]**

**D% = [(Long Term Debt x Debt Rate) + (Preferred Stock Amount x Dividend Rate)]**

**[(Long Term Debt + Preferred Stock Amount)]**

**Total Costs = O&M Costs + Depreciation + Income & Other Taxes + Interest on Customer Deposits**

**Recommended Operating Revenue = Proposed Return on Rate Base + Operating Expenses**

**Total Current Operating Revenues = Distribution + Other Service + Interest + Miscellaneous**

**Proposed Revenue Increase = Recommended Operating Revenues - Current Revenues**

**Revenue Conversion Factor = 1/(1- Income Tax Rate)**

**Recommended Revenue Increase = Proposed Revenue Increase \* Revenue Conversion Factor**

**Recommended Revenue Requirement = Total Current Revenues + Recommended Revenue Increase**

**Distribution Rate = Recommended Revenue Requirement/Annual Distribution Throughput**