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*Regulation of Electric Utilities  
for  
West Bengal, Calcutta, India  
January 5 - 14, 1999*

THE UNITED STATES AGENCY  
for  
INTERNATIONAL DEVELOPMENT

EMCAT- REGULATORY REFORM AND RESTRUCTURING PROJECT

*Prepared by The*

**IRG**

**INTERNATIONAL RESOURCES GROUP**

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# INTERNATIONAL RESOURCES GROUP

MANAGEMENT CONSULTANTS IN ENERGY ENVIRONMENT & NATURAL RESOURCES

February 12, 1999

To Distribution

Attached for your information is a copy of the Final Report for the Workshop, Regulation of Electric Utilities for West Bengal held January 5 and 14 in Calcutta

IRG is pleased to have had the opportunity to present this Workshop and looks forward to further support for the formation of the West Bengal State Electricity Regulatory Commission

Sincerely,

Ronald H Leasburg

Attachment (as mentioned above)

#### Distribution

Mr Badal Sengupta, Chairman, WBSEB (X3)  
Mr S Barma, Principal Sec , Dept of Power, Gov of West Bengal (X3)  
Mr Seshadri, USAID/India  
Ms Eufemia Campagne, IRG/W  
Mr A A Kahn, PFC  
Mr Richard Jones, British Development Cooperation Office  
Mr Djamal Mostefai, World Bank  
Mr T L Sankar, Principal ASCI  
File Task Order 27

# Appendix 1

## Invitation to Regulation of Electric Utilities Workshop

To  
FAX No

AT

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT



AND

INTERNATIONAL RESOURCES GROUP



---

Energy Management Consultation and Training  
Regulatory Reform & Restructuring  
(EMCAT-R3) Project

Workshop  
Electricity Regulation Concepts and  
Practices or Life with the Regulator  
January 09, 1999  
Park Hotel, Calcutta

USAID  
B-28 Qutub Institutional Area  
Tara Crescent Lane  
Near Qutub Hotel  
New Delhi 110 016

International Resources Group  
B-20 First Floor Mayfair Gardens  
Hauz Khas Enclave  
New Delhi 110016

MANAGEMENT CONSULTANTS IN ENERGY ENVIRONMENT & NATURAL RESOURCES

07 Jan 1999

Dear

On behalf on the United States Agency for International Development the Power Finance Corporation the Power Department of the Government of West Bengal and International Resources Group Ltd it is our pleasure to invite you to a **Workshop on Regulation of Electric Utilities** to be held **on January 09, 1999** at the Park Hotel 217 Park Street Calcutta, from 10 00 AM to 5 00 PM

This workshop is designed to provide an overview of the regulatory process and the changes that will occur as regulation is introduced Discussions on the fundamental principles of regulatory system design and regulatory decision making will establish a framework for further consideration of introducing a regulatory regime

Key topics to be covered in the workshop are

- Concepts of Electricity Regulation
  - Benefits of Regulation to the public and to the utilities companies
  - What should be the extent of regulation?
  - Trade-off between price and incentive regulation
  - Non-price aspects of regulation
- Managing the Electric Utility Regulatory Process
  - What are the key issues to be addressed when establishing a Regulatory Commission?
  - Creating creditable and legitimate regulatory decisions
  - Alternative regulatory regimes

We look forward to seeing you at this workshop

Please confirm attendance to

International Resources Group  
B-20 First Floor  
Hauz Kaus Enclave  
New Delhi 110 016 attn Mrs Sharma

FAX 11-686 1676 TEL 11-686-1612 to 1614 652-8754 and 652-8785

To  
FAX No

AT

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT



USAID

AND

INTERNATIONAL RESOURCES GROUP



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Energy Management Consultation and Training  
Regulatory Reform & Restructuring  
(EMCAT-R3) Project

Workshop  
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MANAGEMENT CONSULTANTS IN ENERGY ENVIRONMENT & NATURAL RESOURCES

11 Jan 1999

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FAX 11-686 1676 TEL 11-686-1612 to 1614 652-8754 and 652-8785

# Appendix 2

## List of Workshop Participants

**REGULATION OF ELECTRIC UTILITIES**  
**USAID EMCAT Regulatory Reform & Restructuring Project**  
**International Resources Group, Inc**

January 09, 1999

**Workshop Participants**

**Government of West Bengal**

Mr S Barma	Secretary Power Dept
Mr P K Chattopadhyay	Jt Secretary, Power Dept

**West Bengal State Electricity Board**

Mr Badal Sengupta	Chairman
Mr B R Biswas	Member Transmission
Mr Rajeev Dube	Secretary

**CESC Ltd**

Mr K A Siddiqi	Executive Director T&D
Mr B Raychodhury	Executive Director Finance

**West Bengal Power Development Company**

Mr G D Gautama	Managing Director
Mr A Bhattacharjee	Executive Director Finance
Mr B K Paul	Executive Director Technical
Mr P Banerjee	Executive Director Projects

**Durgapur Projects Ltd**

Dr A K Chanda	Special Secretary & Chairman
Mr A K Ghosh	Managing Director

**Dishergarh Power Supply Co**

Mr A Dasgupta	Director & CEO
Mr S Radhakrishnan	Secretary & General Manager

**Power Finance Corporation**

Mr R Krishnamoorthy	General Manager
Mr V K Kharbanda	Senior Manager

**USAID**

Mr N V Seshadri	Program Manager
-----------------	-----------------

**U S Consulate**

Mrs Debjani Roychowdhury	Economic Specialist
--------------------------	---------------------

**US-AEP**

Mr Arup Mitra	Director- Technical Operations (Eastern Region)
---------------	----------------------------------------------------

**REGULATION OF ELECTRIC UTILITIES**  
**USAID EMCAT Regulatory Reform & Restructuring Project**  
**International Resources Group, Inc**

January 13 1999

Workshop Participants

**Government of West Bengal**

Mr P K Chakraborty  
 Mr K P Bhat

Deputy Secretary Power Dept  
 OSD & Deputy Secy Power Dept

**West Bengal State Electricity Board (WBSEB)**

Mr N C Roy  
 Mr Dipak Kr Ganguly  
 Mr S K Guha  
 Dr S C Bhattacharjee  
 Mr Bhaskar Sengupta  
 Mr S Sarkar  
 Mr N S Chakraborty  
 Mr S Banerjee

Chief Engineer Commercial  
 Chief Engineer (Corp )  
 Finance Manager (Corp )  
 S E (Commercial)  
 Deputy Chief Engineer  
 Additional Chief Engineer (Dist & Comml )  
 Supt Engineer  
 Dy PA & CAO

**West Bengal Power Development Corporation Ltd (WBPDC)**

Mr Anirban Guha  
 Mr Debabrata Das  
 Mr Amit Bhattacharjee  
 Mr Dipak Auddy  
 Mr N K Mukhopadhyay  
 Mr Panda

Manager (MIS)  
 Manager (Mechanical)  
 Manager (F&A)  
 Manager (F&A)  
 Company Secretary & Manager (F&A)  
 Manager (F&A)

**DURGAPUR PROJECTS LTD (DPL)**

Mr S Dutta  
 Mr J K Sarkar  
 Mr T K Bose  
 Mr Susovan Bhattacharya  
 Mr H Dev  
 Mr S Roy

Commercial Engineer  
 Executive Engineer (Commercial)  
 A O (Commercial)  
 Executive Engineer

**CESC Ltd**

Mr Anjan Chowdhuri  
 Mr Subrata Talukdar  
 Mr Utpal Bhattacharyya  
 Ms Gargi Chatterjee  
 Mr Rajarshi Banerjee  
 Mr Joydeep Nag  
 Mr Bijoy Chakraborty  
 Mr Sanjoy Chakraborty

General Manager (Finance)  
 Dy General Manger (Finance)  
 Dy General Manager (Corporate Service)  
 Manager (Corporate Service)  
 Manager Finance  
 Senior Manager Finance  
 Dy Chief Engineer (Operations)  
 Station Manager

**DISHERGARH POWER SUPPLY COMPANY (DPSC)**

Mr D Sanyal  
 Mr D K Nandi  
 Mr Sadhan Dutta  
 Mr K K Taran

Chief Engineer  
 Controller of Accounts  
 General Superintendent  
 Superintendent Engineer

**Punjab State Electricity Board**

Mr R K Singla

Dy Director (Tariff)

**Assam State Electricity Board**

Mr A B Roychowdhury

Controller of Movement

# Appendix 3

## List of Presenters

**Regulation of Electric Utilities  
USAID EMCAT Regulatory Reform & Restructuring Project  
International Resources Group, Inc**

January 9 and 13 1999

**Workshop Presenters**

- |                                    |                                                                                                                                                         |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dr Douglas C Bauer</b>          | Dr Bauer is a former utility executive with two major power companies in the US                                                                         |
| <b>The Honorable Jim Fischer</b>   | Mr Fischer is a former Commissioner of Public Utilities for the state of Missouri USA                                                                   |
| <b>Dr Donald Hertzmark</b>         | Dr Hertzmark is Professor of Economics at Georgetown University in Washington D C                                                                       |
| <b>D Edward Ramsey</b>             | Mr Ramsey is a consultant with International Resources Group Inc , Washington D C , and a former utility executive with a major power company in the US |
| <b>The Honorable Linda Stevens</b> | Mrs Stevens is a former Commissioner of Public Utilities for the state of New Hampshire USA                                                             |

**Workshop Staff**

- |                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| <b>Nims Sharma</b>    | Mrs Sharma is with International Resources Group, Inc New Delhi India |
| <b>Ritika Sawhney</b> | Ms Sawhney is with International Resources Group Inc New Delhi India  |

# Appendix 4

## Agenda

GOVERNMENT OF WEST BENGAL  
DEPARTMENT OF POWER

WORKSHOP ON  
REGULATION OF ELECTRIC UTILITIES

USAID EMCAT Regulatory Reform & Restructuring Project  
International Resources Group, Inc

January 13, 1999

**Objectives**

The objectives of this workshop are to introduce the concept and role of regulation in the electricity sector. Discussions will focus on how established regulatory regimes around the world are changing, outline the application of regulatory principles to India's Central and State Governments, and to outline the steps involved in design, implementation and operation of an electric power sector regulatory body. The workshop will also focus on the responsibilities and expectations of the Government of West Bengal as the process of regulation is developed for the electric power sector.

- 10 00            **Introduction and Welcome**  
Mr Edward Ramsey, Mr S Bama and Dr Douglas Bauer
- Fundamentals of Regulation**  
Dr Donald Hertzmark and The Honorable Linda Stevens
- Design and Implementation of an  
Electricity Sector Regulatory Body**  
The Honorable James Fischer and Dr Bauer
- Fundamentals of Pricing, Rate-making and Financial Techniques**  
Dr Hertzmark and Dr Bauer
- 1 30 - 2 30    **Luncheon**
- Non-Price Factors**  
Dr Bauer and Mr Fischer
- Case Study Establishment of the Wholesale Market and the Role  
of Regulation**  
Dr Hertzmark
- Discussion and Concluding Remarks**  
Dr Bauer and Mr Ramsey
- 5 00            **Adjourn**

# Appendix 5

Fundamentals of  
Regulation,  
Dr. Donald Hertzmark

## Unbundling of Services:

Each type of service requires its own tariff

- Generation
- Transmission
- Sub-transmission
- Distribution
- Wheeling
- Standby/backup

## The Rule of One Price Applies:

For the same service, the same price.

In other words, all power system services must be provided by entities that obey the same set of rules.

Without non-discriminatory pricing the system is plagued by the four horsemen of the apocalyptic brownout:

- Defections
- 2. Arbitrage
- 3. Cost-shifting
- 4. Lack of reliability standards

No one type of restructuring is ideal for every company. You need to consider the following items:

- history of supply and demand;
- growth projections;
- fuel mix;
- technology;
- personnel;
- current profitability;
- potential profitability (how many \$100 bills?)
- strengths & weaknesses;
- culture

Finally, you must take a hard look at the quantifiable assets and liabilities. Compare the restructuring plans with the capabilities of the company.

Two men are walking down the street together, an old, distinguished economist and his prize graduate student. The student sees a \$100 bill lying on the ground. As he stops to pick it up, the professor tells him to stop. “That cannot be a real \$100 bill,” the professor says, “for if it were, someone would already have picked it up.”

# Electricity Pricing Summary:

1. Establish the fuel price - key it to an actual market, netback value (ceiling) or AIC (floor);
2. Determine whether fuel prices are subject to significant depletion premia;
3. Determine the least cost expansion plan for the utility from/to which you plan to buy/sell;
4. Calculate the avoided generation costs for that system;

5. Establish the right of bypass to preserve competitive power.
6. Know your supplier.

# Energy Marketing Companies

What is the problem in deregulated private energy systems?

- cost of reaching and serving customers
- inappropriate load or demand profiles
- high transactional costs to customers of changing suppliers

How does an energy marketing company address these issues and problems?

- custom pricing of various bundles of services
- matching load and supply
- reaching price sensitive customers
- offering added value to customers

---

What are the mechanics of custom pricing and customer packaging?

- know the customer - time patterns and volumes of demand
- study the price sensitivity of different customers to variations in price
- assemble a set of customers that corresponds to a profitable supply resource mix

- give customers incentives to stay within their demand profiles with penalties for excursions
- minimize payments of access fees (e.g. personal digital telecoms market)
- provide customers with detailed information about energy use

# **Case Study: A restructured power system in South America**

# ***Generation Tariffs***

- Spot market balances supply and demand
- Prices give signals to consumers and generators regarding need for additional capacity
- Prices reflect marginal value of electricity to system

# The System Marginal Price

At any given time of day the SMP will consist of the following:

$$\begin{aligned} \text{SMP} = & \text{MEC} + \text{MOC} + \\ & \text{additional services} \\ & \{ \text{reactive power, cold} \\ & \text{reserve, spinning} \\ & \text{reserve, short} \\ & \text{distance} \\ & \text{transmission for} \\ & \text{IPPs} \} + \\ & \text{Transmission Tariff.} \end{aligned}$$

**Additional Services:** Other elements in the electricity price include reactive power, spinning and cold reserves and short distance transmission for IPPs. The spinning reserve will be defined as 10% of the actual sendout, with the price being that MEC + MOC that is relevant for a given period. The cold reserve will be let out for bids and will probably be no more than 2% of the MEC+MOC. The reactive power tariff will be the lesser of bids by generators or the cost of installing capacitors by the

transmission system. These additional services will amount to \$0.01 - 0.025/kWh under typical conditions.

# Transmission Tariffs

The transmission system will need to pay for the following services:

1. The cost of recovering investment in transmission;
2. The costs of maintaining transmission of energy and capacity under specified conditions of quality and reliability to the wholesale customers, distribution companies and other bulk power purchasers;

3. This amount may include congestion charges;
4. Payments to generators for voltage and frequency control;
5. Physical losses in transmission;
6. New transmission capacity in the system, and
7. A variety of other overall system costs. These overall system costs include, but are not limited to, the following:
  - i. Regulation,

- ii. Systems Operation & Dispatch,
- iii. transactions settlements,
- iv. dispatch, if different from Systems Operation

One of the most important issues in setting transmission tariffs is whether to allow regional variation in such charges.

**Transmission Fixed Charge  
= Annual Common  
Cost ÷ annual peak  
demand.**

# Computing the Marginal Outage Cost - a Numerical Example

The table below shows an actual computation of the avoided cost method.

- The present values of the investment costs and expected electricity production are computed, given

weights for both cost and output.

- The average avoided capacity charge, at the bottom of the table, represents the weighted average investment cost per kWh produced for plants put into service for this load period.

Intermediate Load Plants						
Type of Plant	Total PV capital cost	Total PV kWh	% of total cost	% of total kWh	\$/kWh	
hydro	286,901,743	5,690,591,389	64%	43%	0 0504169	
GT	115,909,091	5,206,502,369	26%	39%	0 0222624	
GCC	43,747,115	2,389,206,087	10%	18%	0 0183103	
coal	0	0	0%	0%	0	
diesel	0	0	0%	0%	0	
oil steam	0	0	0%	0%	0	
Avg KWH Capacity Charge					0 033610	

In this case, hydro and combustion turbines share output about equally, though hydro has far more of the investment costs. Thus the heavy initial cost of hydro makes the capacity cost relatively high, though the resulting energy cost will be lower than with fossil plants for the portion of the load that is met by hydro.

# Appendix 6

Regulatory Commission,  
Mr.. James Fischer

# 1. Legal Issues Related to the Creation of the Regulatory Body

---

- The Electricity Regulatory Commissions Act of 1998 provides legal basis for regulating prices and tariffs.
- The Broad Goals are to:
  - ▶ Rationalize the delivery of power;
  - ▶ Achieve electricity tariff levels which recover the real costs of delivering power to consumers;
  - ▶ Improve the financial health of the Indian power industry;
  - ▶ Improve the quality and quantity of power available to Indian consumers;
  - ▶ Improve the efficiency of power delivery.

# General Legal Concepts Related to Public Utilities

---

- **Public Utilities Have Two Major Legal Obligations**
    - ▶ **Must serve all buyers within their market area without undue discrimination up to the limits of their capacity (and they may even be required to increase their capacity if demand for their product expands);**
    - ▶ **Must sell their services at “reasonable” rates or prices.**
      - **Reasonable prices are prices that will give the public utility a reasonable opportunity to earn a reasonable profit under prudent management.**
-

## ■ **Shareholders of Public Utility:**

- Successful privatization requires investor-confidence;
- Investors must believe that their investment is relatively safe;
- Regulator must not make arbitrary decisions that reduce or eliminate the value of the investment;
- Have confidence that they will have a fair opportunity to earn a reasonable return on their investment.

## ■ **Overall Public Interests:**

- Adequate supplies of safe and reliable electric energy,
  - Promote business and economic development,
  - Provide basis for growth in overall economy
-

# Fairness and Objectivity of Regulator

---

- Both the reality and the perception of competence, fairness and objectivity of regulator are vitally important to the successful fulfillment of Regulator's role.
  - Rules, regulations, policies, and procedures that contribute to assuring fairness and objectivity of the decisionmaking process are critically important.
-

# **Broad Role of Regulator**

---

- **An Objective and Neutral Balancer of Interests**
  - ▶ **Consumer Interests:**
    - Reasonable and affordable level of rates;
    - Safe and adequate levels of service;
    - Eliminate undue discrimination among customer classes.

## **2. Management Issues and Organization of a Regulatory Agency**

---

- **Major Objectives of Organizational Structure:**
  - ▶ **Provide the Regulator with Support Staff that:**
    - **Handles the filing and processing of “cases”;**
    - **Provides expert technical advice to the Regulator to assist the Regulator in understanding and evaluating expert testimony (Advisory Staff);**
    - **Investigates, audits and evaluates the public utilities under the Regulator’s jurisdiction and presents necessary information to Regulator (Advocacy Staff);**

## **Major Objectives of Organizational Structure (cont'd)**

- Presides over the Regulator's evidentiary hearings and writes the text of the official decisions of the Regulator (Regulatory Law Judges);**
  - Handles administration of the agency, such as budgets, payroll, procurement of supplies, and recruitment of employees (Administrative Division).**
-

# Typical Organizational Structure

---

- **The Regulator**
  - ▶ **Clerical Assistants**
  - ▶ **Regulatory Law Judges**
  - ▶ **General Counsel**
  - ▶ **Director of Advisory Staff**
  - ▶ **Director of Administration**
  - ▶ **Director of Advocacy Staff**
    - **Advocacy Counsel**
    - **Director of Economic Analysis**
    - **Director of Financial Analysis**
    - **Director of Accounting and Audits**
    - **Director of Engineering**
    - **Director of Tariffs**

# 3. Operation of the Agency

---

- Issues to be addressed:
    - ▶ Standards of Conduct;
    - ▶ Rules of Practice and Procedure;
    - ▶ Internal Procedures for handling cases and other matters;
-

- ▶ Establishment of a Uniform System of Accounts;
  - ▶ Substantive Rules governing the safety and operation of public utilities;
  - ▶ Internal management procedures of the Agency: ✓
    - Personnel Policies;
    - Job Descriptions,
    - Procurement Policies;
    - Budget Preparation and Management;
    - Financial Accounting requirements for Agency receipts and expenditures.
-

## 4. Standards of Conduct

- **Conflicts of Interest (Financial Interest):**
  - ▶ **Rules and regulations should define, and prohibit conflicts of interest which could reduce the Regulator's objectivity and fairness.**
  - ▶ **Most obvious conflict of interest: Regulator or employees financial interest in regulated public utility.**
  - ▶ **Gratuities prohibited (including meals, gifts, services, or travel).**

# Ex Parte Communications

---

- An Ex Parte Communication is a communication with the decision-maker by one side only, without the other interested parties.
  - To assure fairness (and the perception of fairness) in the regulatory process, it is imperative that the Regulator's decisions be based entirely upon the "record" of the case.
-

# Ex Parte Communications

- Examples: “Off-the-record” discussions at a social event, conversations about the case with members of the Advocacy Staff, or other conversations with an interested party without the knowledge of other parties of the case.
- Rules against Ex Parte Communications should be adopted and strictly enforced.

# **5. Procedures for the Regulator's Rate-setting Process: "Dockets" (Cases) as Vehicles for Decision-making**

---

## **■ Application Dockets**

- Certificates to permit public utilities to operate or expand their business;**
  - Approve transfer of assets or mergers of public utilities;**
  - Establish prices (or tariffs) for services; (File & Suspend)**
  - Encumber assets of public utilities to raise funds;**
  - Other requests for changes in regulation by public utilities or interested parties.**
-

# **5. Procedures for the Regulator's Rate-setting Process: "Dockets" (Cases) as Vehicles for Decision-making (cont'd)**

---

## **■ Complaint Dockets**

- ▶ Resolving complaints against public utilities;
- ▶ Used to lower rates when considered excessive.

## **■ Generic Dockets**

- ▶ Used as broad investigatory dockets to resolve major issues.

## **■ Rulemaking Dockets**

- ▶ Used primarily to adopt generally applicable rules and regulations.

## 6. Role of the Staff in Dockets and Hearings

---

- When an Application or Complaint is filed, the Chief Docket Clerk creates a formal case and distributes it to the Advocacy Staff;
- The Advocacy Staff and Advocacy Counsel decide what steps to take and what issues to raise before the Regulator;
- Additional Staff personnel would be added to the project, as necessary (including engineering, accounting, financial analysts, and economists).

## ■ **B. Pre-hearing Conference:**

- ▶ **Typically, the parties suggest a schedule for the case at the prehearing conference, and discuss procedural matters.**
- ▶ **Prehearing Conferences are also used to draft Hearing Memorandums which state what substantive issues need to be resolved by Regulator.**
- ▶ **Settlements of the case (when all parties agree on the appropriate resolution of issues) occur at the Prehearing Conference.**

## ■ C. Hearings:

- ▶ In the United States, hearings are conducted similar to civil trials in courts.
- ▶ Factual records are kept by court reporter.
- ▶ Regulatory Law Judge will preside over the hearing, ruling upon legal objections.
- ▶ Witnesses file written testimony before the hearing.
- ▶ Cross-examination of witnesses (questions regarding their pre-filed testimony) by the parties or the Regulator occurs at the hearing.
- ▶ Hearings may take several hours, or several weeks, depending upon the complexity of the issues and number of interested parties.
- ▶ Written briefs are filed after the written transcripts of the hearing are available.

## D. Process and Format for Decisions

---

- After the briefs are filed, the Regulator begins the process of studying the evidence and briefs and reaching a decision on each of the issues in the case.
- Regulatory Law Judge customarily discusses the case with the Regulator during the decisionmaking process, and begins writing a decision based upon the conclusions of the Regulator.
- The final decision should be in writing, and should explain the reasons for the decision.

## **8. Rules of Practice & Procedure**

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- **Rules of Practice & Procedure may include:**
  - ▶ **Location, Mailing Address & Telephone of Regulator;**
  - ▶ **Define “quorum” for transacting business;**
  - ▶ **Requirements for attorneys and corporations to appear before the Regulator;**
  - ▶ **Requirements for various types of Applications & Pleadings.**

## **8. Rules of Practice & Procedure**

---

- Rules of Practice & Procedure may also include:
    - ▶ **Discovery procedures;**
    - ▶ **Procedures for Prehearing Conferences, Hearings and Settlements;**
    - ▶ **Prescribes rules of evidence;**
    - ▶ **Procedures for Briefs and Oral Arguments;**
    - ▶ **Method of Issuing Decision and Effective Dates;**
    - ▶ **Sample Forms of Applications, Complaints, etc.**
-

## 9. Manual of Internal Procedures

---

- The Regulator should implement an Internal Procedures Manual for handling cases and other matters of importance to the Agency in a systematic and consistent manner:
  - ▶ **Giving notice of case to interested parties & media;**
  - ▶ **Assigning docket numbers and regulatory law judges;**
  - ▶ **Filing Staff Recommendations;**
  - ▶ **Handling Confidential and Proprietary Information.**

## **10. Uniform System of Accounts**

---

- All regulated companies must keep financial books and records in a uniform manner.
    - ▶ In the United States, all electric and gas companies are required to use the Uniform System of Accounts prescribed by the Federal Energy Regulatory Commission and state commissions.
    - ▶ Found at 18 Code of Federal Regulations, Part 101.
-

# 11. Substantive Rules Governing Operation of Public Utilities

---

- Additional rules and regulations may be adopted by the Regulator to govern other aspects of providing electricity to customers, to promote minimum service quality standards, billing and collection practices, and safety standards:
    - ▶ Electric meters;
    - ▶ Reporting requirements for accidents and outages;
    - ▶ Integrated Resource Planning.
-

## 12. Tariffs

---

- All rates, charges and rules of any electric utility may be printed on “tariff sheets” filed with the Regulator;
  - Notice to consumers of exactly what rates apply to services;
  - Makes it easier to consider changes to rates or terms of service.
-

# 13. Annual Report of Public Utilities

---

- Electricity suppliers are typically required to file annual reports with the Regulator.
  - In the United States, electric companies are required to file a “FERC Form No. 1: Annual Report of Major Electric Utilities, Licensees and Others.”
  - State regulators may also require an annual report specific to their state jurisdiction.
-

# 14. Importance of Public Outreach Programs

---

- Public Confidence in the Regulator is critical.
- In order to communicate with the general public, a Public Outreach Program is necessary.
- Typical Public Outreach Programs include:
  - ▶ **Press Releases on All Major Decisions or Proposed Rules;**
  - ▶ **Consumer information pamphlets and brochures;**
  - ▶ **Annual Reports of Regulator to legislature and Chief Executive.**

## **14. Importance of Public Outreach Programs (cont'd)**

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- **Typical Public Outreach Programs include:**
    - ▶ **Local Public Hearings;**
    - ▶ **Meetings with Legislators regarding key issues;**
    - ▶ **Video Presentations regarding Regulator and its functions;**
    - ▶ **Interviews by Regulator with News Media;**
    - ▶ **Consumer Affairs Department to help resolve specific consumer complaints--toll free telephone number to reach Regulator.**
-

## 15. Internet Websites

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- Recently, most regulators in the United States have created Internet Websites to communicate with the public and industry participants.
  - Helpful Websites include:
    - ▶ **National Association of Regulatory Commissioners--<http://www.naruc.org/>**
    - ▶ **Federal Energy Regulatory Commission--<http://www.ferc.fed.us/>**
    - ▶ **Missouri Public Service Commission--<http://www.ecodev.state.mo.us/psc/>**
-

## **16. Mechanisms for Funding Regulatory Bodies**

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- ▶ Traditionally, the following mechanisms are used for funding regulatory bodies:
  - ▶ Appropriations from tax funds;
  - ▶ Assessments of regulated public utilities;
  - ▶ Filing Fees;
  - ▶ Direct assessment of audit costs.
-

# Appendix 7

Design & Implementation  
of an Electricity Sector  
Regulatory Body,  
Dr. Douglas Bauer

**Design and Implementation of an Electricity Sector Regulatory Body**  
Dr Douglas Bauer

*Legal issues related to the creation of the regulatory body and the establishment of its mandate and responsibilities*

- Enabling law (state equivalent of The Electricity Regulatory Commissions Act, 1998)
- Composition of regulatory commission
- Necessary supporting staff
- Responsibilities of Commission
  - Tariffs
  - Terms and conditions of service
    - reliability
    - customer complaint responsiveness
    - power quality (voltage, frequency)
    - energy efficiency programs
    - low income customer assistance
    - promotion of renewable energy
    - market entry conditions
    - customer interruption priorities
- Role of Hearing Examiners
- Standards for Commission decision-making
  - Transparent decisions based upon evidence in the record taken as a whole
  - "just and reasonable rates"
  - procedural safeguards
  - notice and opportunity for hearing
  - requirements for adequate filings
- Judicial Review
  - Who may appeal?
  - Grounds of appeal?
  - Standards of review? (e.g., "arbitrary or capricious," "decision not based upon substantial evidence in the record taken as a whole") (avoidance of substituting factual judgment of courts to that of regulatory body)

*Management issues particularly staffing organizational structure and communications*

Composition of Staff

Necessary expertise

- Economics
- Finance
- Engineering (power electrical, civil engineering)
- Law
- Planning
  - Strategic Planning
  - Integrated Resource Planning

Training of Staff in utility functions (generation, transmission distribution, customer services, including DSM)

Communications with public

Rulemaking

- Notice of hearings and opportunity for comment by interested parties
- Dissemination of decisions

Notice of Inquiry (NOI) proceedings

- To refine/narrow issue definition, clarify party positions, facilitate technical exchange, discern possible consensus positions
- E g , congested transmission pricing, ancillary transmission services (spinning reserve, voltage control, black start capability)
- Evaluation of new organizational structures, e g independent system operators (ISOs) to facilitate trading with generators and independent power producers

Notice of Proposed Rulemaking (NOPR) proceedings

- Integrated Resource Planning
- Industry restructuring
- Terms and conditions of market entry
- Responsibilities of the ISO

Communications *within* organizations

- Within utilities (planning, rates, finance, engineering (especially transmission and distribution planning), DSM groups)
  - Strategic planning
  - Business planning (operational planning)
- Within the commission
  - Ex-Parte Rules?
  - Staff-commissioner communication (any time, during a contested proceeding)

*Communication with the Public including Public Outreach Programs*

Newsletters bill stuffers (who owns unused space?)

**Citizen advisory committees**

Rates

- DSM

Policies on interruption of service

Service quality

- Siting

- Planning

- Environment

**Coalition Building***Mechanisms for funding regulatory bodies*

- Charge to utilities

- Taxes levied by legislature

# Appendix 8.

Fundamentals of Pricing,  
Rate-making and Financial  
Techniques,

Dr. Douglas Bauer

**Fundamentals of Pricing, Rate-making and Financial Techniques**  
Dr Douglas Bauer

**I COST RECOVERY**

**A Revenue Requirement**

Basic Principle

Rates should be sufficient to pay all reasonable operating expenses and recover the cost of capital

Basic Formula

$$RR = O\&M\ EXP - DEP\ EXP - TAX\ EXP + ROR \times RB$$

Where

RR = Revenue Requirement

O&M EXP = Operations and Maintenance expenses

DEP EXP = Allowed Depreciation expense

TAX EXP = Tax expenses

ROR = Rate of Return (balanced on basis of capital debt/equity structure)

RB = Rate Base (value of used and useful investment less accumulated depreciation)

Issues in Formula

What test period should be used for costs? (typically 12 months in length)

Historic or future

Which rate base should be used?

Average or year-end

Which forecasts to use?

Econometric? End use? Blend?

What's included in rate base?

Original cost less depreciation plus

Assets held for future use (land, property) [sometimes]

AFUDC

Pollution Abatement

R&D

Allowance for Working Capital

Normalized taxes (')

accumulated deferred taxes treated as cost-free capital  
method of depreciation (straight line vs accelerated)

- Disposition of controversial operating expenses

Dues and contributions  
advertising  
political expenditures  
appliance merchandising

- Cost Disallowances and Prudence Reviews

Used and Useful Test ["outcome test"]

Prudence Test

presumption  
reasonable under circumstances at the time  
no hindsight disqualifier  
review on facts then

- What's a 'fair rate of return' [ROR]

Algebraically,  $ROR = [RR - Costs] - RB$

All these terms are controversial. But how do we arrive at ROR from other than the result of the formula above? Answer "Fair Rate"

Balance efficiency and fairness

Sufficient Revenues to achieve Reasonable cost recovery + Fair or reasonable rate of return to stockholders

If ROR is too high, *inefficient* utility investment will be encouraged (Johnson Average effect)  
If ROR is too low *insufficient* utility investment for efficient and adequate power supply

- Cost of Capital

Rate of Return

Weighted average of debt and equity

Mix set by balancing cost of capital and risk (typically d/e = 55/45)

U S law: no specific formula. outcome determined

Cost of Equity

Comparable Earnings

Risk Premium Method

Cost of Equity = Risk Free Rate + Utility's specific risk premium

Discounted Cash Flow Method

Current + Expected Dividend yield

### Capital Asset Pricing Model

$$\tau_e = \tau_{rf} + \beta (\tau_m - \tau_{rf})$$

$\tau_e$  = Cost of Equity

$\tau_{rf}$  = Risk-Free Return

$\beta$  = Coefficient for particular utility's stock

$\beta < 1$  (utility less risky than average market risk)

$\beta > 1$  (utility more risky than average market risk)

$\tau_m$  = estimated expected rate of return on broad market portfolio

### Variations on Pricing Methods ["Incentive or Performance Based Ratemaking"]

Setting allowable band for ROR

profit incentive to cut costs

penalty if costs escalate to top of band

Price Caps

Revenue Caps

### B Cost-Based Rates and Cost Allocation

#### 1 Basis

*Cost of Service Study*

Purpose To define each customer group's appropriate share of total revenue requirement

#### Four Steps

- group customers into relatively homogeneous usage groups based upon total annual load, annual load factors, type of use (industrial commercial residential) available customer information, customer class rate objectives
- functionalize costs (production, storage, transmission, distribution, customer accounts/services, administrative)
- classify functionalized costs (capacity, commodity (energy), customer 'hook up' cost)
- *allocate* costs by customer groupings

### Marginal Cost (MC) vs Embedded or Accounting Cost (AC)

Useful to undertake both MC and AC Cost of Service Studies

Issues Definition of MC (time perspective, incremental block, unique vs common costs)  
cost of determining MC  
revenue reconciliation

## II. RATE DESIGN

- no one 'right' way
- reflects business objectives
- part of customer contract (price terms conditions)

### Some Criteria on Rates

- just and reasonable
- not unduly discriminatory
- avoid confiscation of owner property or customer oppression
- balancing customer and owner interest
- fair apportionment of costs
- promote economic development and employment
- enhance economic efficiency
- reflect true social costs

### Other Rate Considerations

- avoiding rate shock (e.g. \$1000/mwh during recent midwest heat wave)
- maintaining public acceptance
- revenue stability
- reliable bases for business and expansion planning
- relating rates and service quality

### Rate Types Relating to Customer Consumption Profile

- flat rates
- step rates
- declining block rates
- inclining block rates

### Rate Types Relating to Service

- firm rates
- lifeline rates
- interruptible rates
- season rates
- time of day rates
- standby rates
- incentive rates

typical two part tariff capacity and energy charge

### Rate Innovations

#### Value-of-Service Pricing

- Customer-specific rates
- economic development rates
- incentive rates

#### Performance Based Ratemaking (PBR) (20 states)

"zone of reasonableness" for ROR (inflationary times PSNM example)

Price caps (may discourage energy efficiency)

Revenue caps (encourage energy efficiency)

# Appendix 9

Pricing,  
Dr. Donald Hertzmark

**THE MARKET SHOULD BE ORGANIZED AND OPERATED UNDER THE FOLLOWING GENERAL RULES**

- Sell non-contracted output of generation companies to the pool Output that goes to the pool will be one of the following
  - Under contract to System Operator
  - Purchased as peak, reserve, standby, reactive, or in another category
- SYSTEM OPERATOR will establish a System Marginal Price at which distribution companies purchase the remainder of their requirements, either from the pool or from generation companies with surplus capacity (under a system of contracts-for-differences)
- SYSTEM OPERATOR will establish the marginal price of energy at wholesale level

$$\text{Marginal Cost of Electricity} = \text{Marginal Energy Cost (computed from Dispatch)} + \text{Marginal Outage Cost (computed from system expansion models)}$$

and

$$\text{System Marginal Price} = \text{Marginal Cost of Electricity} + \text{Costs of Transmission} + \text{Costs of Running SYSTEM OPERATOR \& other institutions}$$



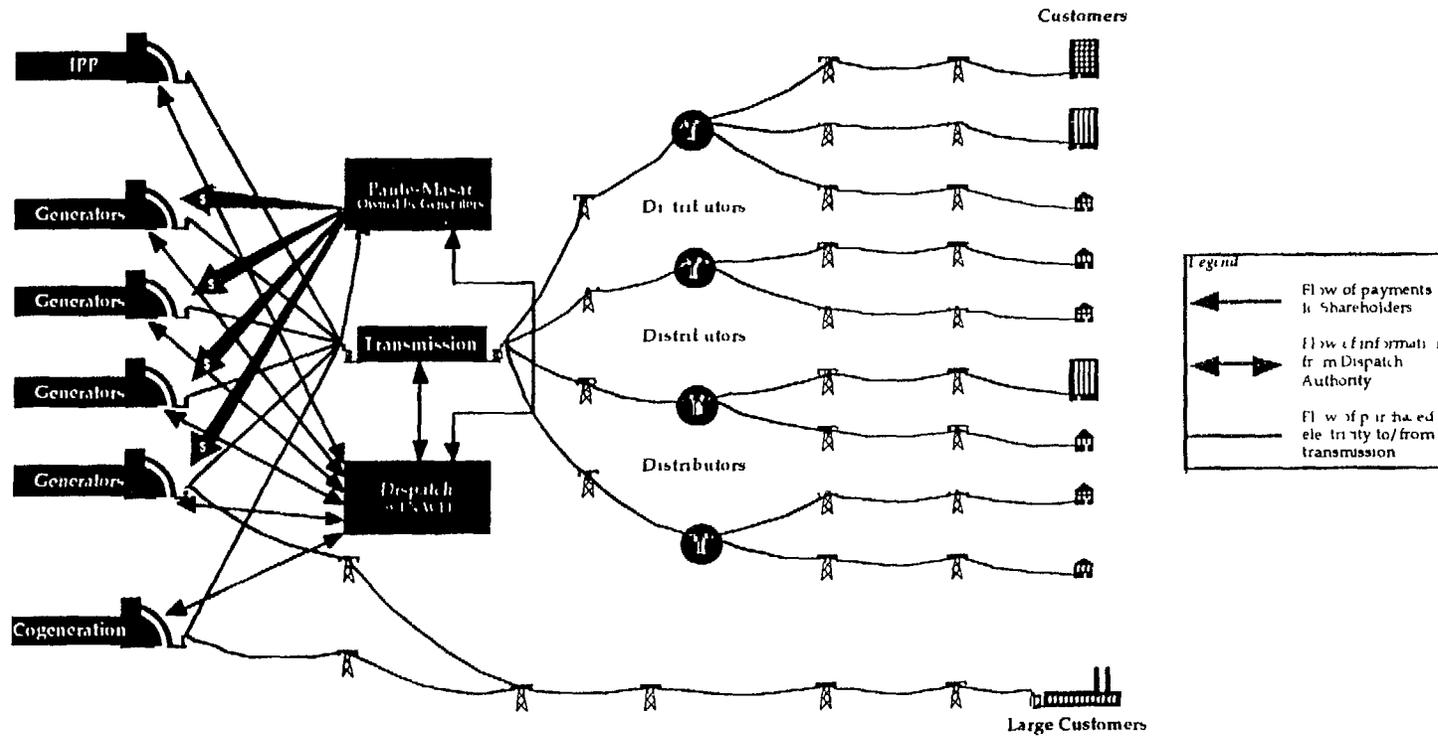
## Competition Rules

### **COMPETITION RULES, REGULATED BY CONELEC, WILL ENABLE THESE ELECTRICITY SALES TO BE MADE IN A MANNER THAT IS BEST FOR ECUADOR**

- These rules will include the following elements
  - Public posting of all MECs and MOCs daily for the previous day's trading
  - Maintaining a registry of all bilateral contracts, including contracts for differences
  - Providing for regulation of Paute-Masar
  - Overseeing and adjusting the proportions of individual generation company output that will go to individual distribution companies and vice-versa
  - Publish least cost simulation results annually

Competition Rules

**THIS CHART ILLUSTRATES THE TRANSACTIONAL AND INFORMATION FLOWS ON BOTH THE GENERATION AND DISTRIBUTION SIDES**



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## II BIDDING & SPOT PRICING

**THE WHOLESALE MARKET WILL GIVE ALL PARTICIPANTS THE INCENTIVES AND THE ABILITY TO RESOLVE SHORTAGES OR SURPLUSES**

- Generation companies will contract with each other for differences between obligations and capabilities. SYSTEM OPERATOR will monitor these contracts-for-differences
- A public forum available to all market participants (e.g., daily newspapers) will print the daily Marginal Energy Cost (MEC) and Marginal Outage Cost (MOC), with the relevant marginal unit(s)

**THE SPINNING RESERVE OF THE SYSTEM WILL BE AVAILABLE FOR BIDDING**

- Generators will bid out the reserve at a given time and will be paid the system marginal energy cost for that reserve plus marginal outage costs, if applicable
- Requires a spot pricing mechanism to balance daily consumption with demands
  - Suppliers without contracted loads must be able to offer available capacity to consumers
  - Consumers not fully contracted want a marketplace to satisfy their marginal supply needs
- SYSTEM OPERATOR will be active in the marketplace
  - To purchase capacity to meet its needs
  - To purchase reserves to back bilateral contracts and spot transactions
  - To purchase reserves for voltage support and offset reactive power consumption

**SPOT PRICING WILL BALANCE DAILY CONSUMPTION WITH DEMANDS, AND PROVIDE SIGNALS TO INVESTORS OF EXPECTED RETURNS**

- Procedure for spot pricing
  - A single price will be quoted for each pricing period of the next day (hour or half-hour intervals)
  - Spot prices will be posted publicly
  - Consumers who do not have a bilateral agreement in place will use the spot prices
- Level of spot prices should reflect the marginal value of capacity to the system
- As system loads increase, MOCs may be higher and generators serving marginal loads will realize extraordinary profit levels
- Investors will view the MOC as an indicator of the price for both marginal and base load capacity

## **SPOT PRICING WILL ENCOURAGE BALANCED INVESTMENT**

- Customers will face higher pool prices for load not under contract, as market tightens
- MOC premiums will become the basis for premiums in bilateral contracts
- *Falling reserves* with consequent rising outage costs will allow generators to realize greater prices for base loads supplied under bilateral contracts
- If prices continue to rise, investors will find greater expected returns in electric generation than elsewhere, and they will build new capacity
- Added capacity will force prices downward in the spot market, reducing premiums in the bilateral market as well
- Investors will continue to add capacity until diminishing returns make the investments unacceptable in light of other opportunities

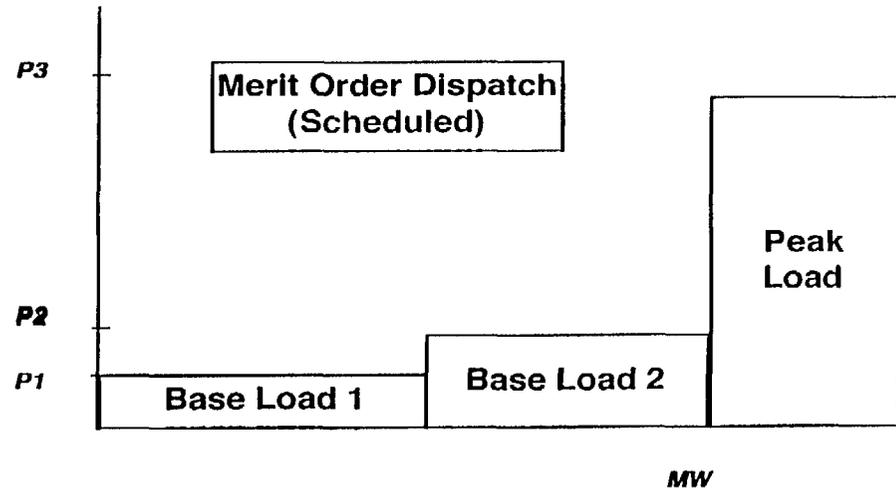
**SYSTEM OPERATOR MUST ESTABLISH THE COST FOR SERVING A MARGINAL UNIT OF CONSUMPTION THIS IS CALLED THE MARGINAL ENERGY COST (MEC)**

- SYSTEM OPERATOR establishes MEC by soliciting bids from generators for supply for each hour of the next day
  - SYSTEM OPERATOR will dispatch generation to meet marginal demands according to least cost principles
  - SYSTEM OPERATOR may use calculations of MEC in place of bids

**IT DOES NOT MATTER WHETHER THE MEC IS BID OR CALCULATED ULTIMATELY, BIDS WILL ESTABLISH THESE COSTS AND THE BIDDING SYSTEM WILL ELICIT HONEST BIDS**

**SCHEDULED MERIT ORDER DISPATCH WILL BE ACCORDING TO LEAST COST PRINCIPLES**

**Marginal Energy Costs (MEC)**



- During periods when demand is strictly less than the MW of base load unit 1, MEC = P1 and only Base Load Unit 1 will be dispatched
- During periods when demand is strictly less than the MW of peak load units, MEC = P2 and only Base Load Units 1 and 2 will be dispatched
  - Owners of Unit 1 will earn profits above their variable O&M costs
- During periods when demand is strictly greater than base load units 1 and 2, MEC = P3 Peaking plants, whose MECs are greater than P3, will not be dispatched
  - Base load units available for peak dispatch will earn high profits during peak hours

pb

**LOWEST BID RESOURCES WILL BE USED FIRST, FOLLOWED BY THE NEXT LOWEST, AND SO FORTH UNTIL ALL DEMAND IS MET**

- SYSTEM OPERATOR will match staggered supply bids with a forecast of demand to set the spot energy price
- The price quoted for the last increment of supply required becomes the spot price for that hour
  - All suppliers whose bids are lower will receive the price of the market clearing supplier if they are dispatched
  - Suppliers who have generation that is not otherwise obligated can respond to the call for bid by offering all or part of its generation at bid prices

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**SUPPLIERS CAN MAXIMIZE THEIR RETURNS FOR SERVING THE SPOT MARKET USING THE FOLLOWING PROCESS**

- Suppliers should bid their marginal running costs, cost of fuel, and variable O&M. This way, each supplier is ensured that if he is dispatched, at worst he breaks even. If his costs are lower than those of what turns out to be the incremental supply unit, then he realizes a profit
  - Suppliers that bid above marginal cost risk losing to other suppliers whose costs are the same and who bid at cost
  - Suppliers who bid below marginal cost risk having that bid accepted and having to provide electricity at a loss
- Demand forecasts must be available to all market participants and must be unbiased and consistent
- The market must be regulated to ensure that all parties act in accordance to the principles of competition
- Costs for hydro plants will typically be above the actual O&M cost of supplying electricity for all periods but baseload ones. Thus, hydro plants dispatchable during shoulder and peak periods will obtain prices in excess of their own MECs

**IF THE MARKET IS CHARACTERIZED BY A LARGE NUMBER OF BUYERS, THERE WILL BE A SUFFICIENT DEGREE OF SUPPLY DIVERSITY TO PRECLUDE COLLUSION OR THE EXERCISE OF MARKET POWER BY ONE SUPPLIER OR CONSORTIA**

**MARGINAL ENERGY COSTS CANNOT CONVEY ALL INFORMATION REQUIRED FOR THE ELECTRIC POWER SYSTEM TO OPERATE EFFICIENTLY**

- MEC will not indicate whether and under what circumstances new baseload capacity should be built
- MEC alone will not indicate the conditions for profitable additions to hydro stations that enhance the dispatchability of such power plants

**CHANGES IN RESERVE MARGINS, LOAD GROWTH, RAINFALL, AND OTHER FACTORS AFFECT THE ABILITY OF THE SYSTEM TO SUPPLY ELECTRICITY TO ALL CUSTOMERS**

- This calculation is typically derived from the capacity charge that is made for the marginal plant (normally a combustion turbine)
  - Appropriate price signals on the value of additional capacity will vary over seasons and time of day
  - The combustion turbine capacity charge may not accurately reflect the interplay of all supply and demand factors that affect the value of capacity in the system
- Failure of generation units is a serious cause of risk for SYSTEM OPERATOR

**WE WILL EXAMINE TWO DIFFERENT CASES IN WHICH SYSTEM OPERATOR IS EXPOSED TO RISK FROM UNIT FAILURE ONE WHERE UNIT FAILURE IS LOW, AND A SECOND WITH HIGHER UNIT FAILURE**

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**TO SET A BID, THE GENERATORS MUST CONSIDER SEVERAL FACTORS**

- The spot price is established by the bid of the suppliers for the last unit expected to be needed to serve marginal consumption
- Supplies are dispatched in the order of their bids, from lowest to highest
- Suppliers whose bids exceed those of the last supply unit have lost their opportunity to be dispatched

**SUPPLIERS MUST BE TREATED EQUALLY AND FAIRLY AND MUST NOT COLLUDE IN SETTING DAILY PRICES**

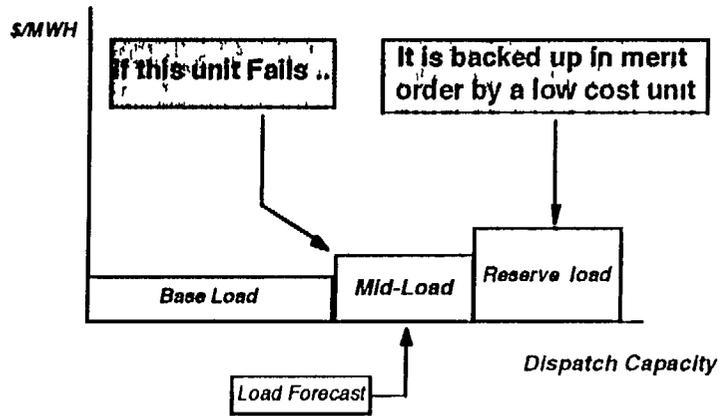
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### III MARGINAL OUTAGE COST

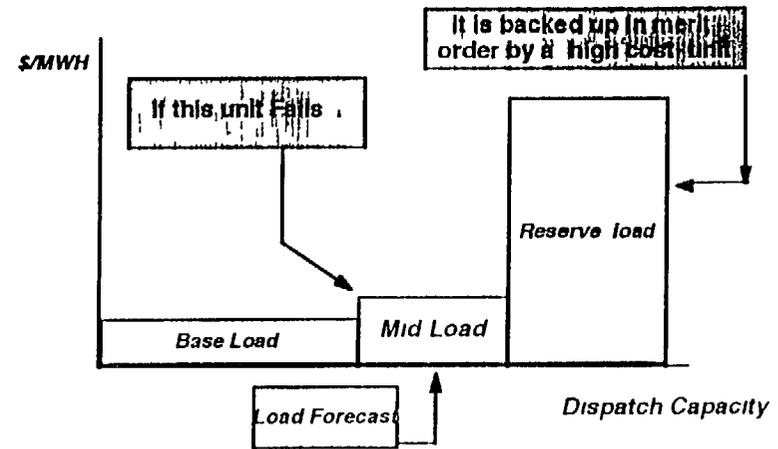
Marginal Outage Cost

**THE EXPOSURE OF THE SYSTEM OPERATOR TO UNIT FAILURE DEPENDS ON THE COST DIFFERENTIAL BETWEEN THE PLANNED UNIT AND THE RESERVE UNIT, AND THE CERTAINTY WITH WHICH THE LOAD FORECAST CAN BE MADE**

**Sources of MEC Exposure**  
Exposure depends on the backup cost for the unit that fails



**Sources of MEC Exposure**  
The Unit that fails is backed up at high cost



## Marginal Outage Cost

**TO BALANCE SUPPLY AND DEMAND, SPOT PRICES MUST REFLECT MORE THAN OUT-OF-POCKET COST OF SUPPLY THE MARGINAL OUTAGE COST WILL BALANCE SUPPLY AND DEMAND IN A WIDE RANGE OF CIRCUMSTANCES**

- A further rationing cost is added to the marginal energy cost derived from bids received from suppliers This is called the Marginal Outage Cost (MOC)
- When loads are low, suppliers will have marginal capacity available at relatively low prices (when compared to contract prices) and their bids to the spot market will be low
  - Customers who can adjust to the attractive prices and who have marginal consumption opportunities whose value exceeds those prices can expand loads profitably
- As supplies become more committed and marginal costs go up, so do spot prices
  - Consumption prices for some users will exceed the marginal value realized from purchasing more electricity

**IN THIS WAY, THE MARKET COMES INTO BALANCE THE EXCESS OF SPOT PRICES OVER THE MEC REPRESENTS THE VALUE OF ADDITIONAL CAPACITY (OR AVOIDANCE OF LOAD SHEDDING) AND IS REFERRED TO AS THE MOC**

**MOCs BECOME IMPORTANT WHENEVER THE MARGINAL SUPPLY IS BELOW THE MARGINAL DEMAND THAT WOULD BE TAKEN AT THE OUT-OF-POCKET COST**

- What if several generation units are out of service at the same time, so that many customers are in the market seeking marginal supplies to replace the lost supply under various bilateral agreements?
  - The units left generating might not have enough capacity to supply the market
  - Under a spot market price that relies solely on the MEC, such a capacity shortage would result in a spot price that is well below the marginal value of electricity
    - This affects the customer who has lost his contract supplies and is seeking base load to serve his everyday needs, rather than one who is pursuing a marginal and discretionary opportunity
    - This type of situation often arises in countries with chronic capacity deficits, and it carries large economic costs
- SYSTEM OPERATOR would be forced to curtail purchases

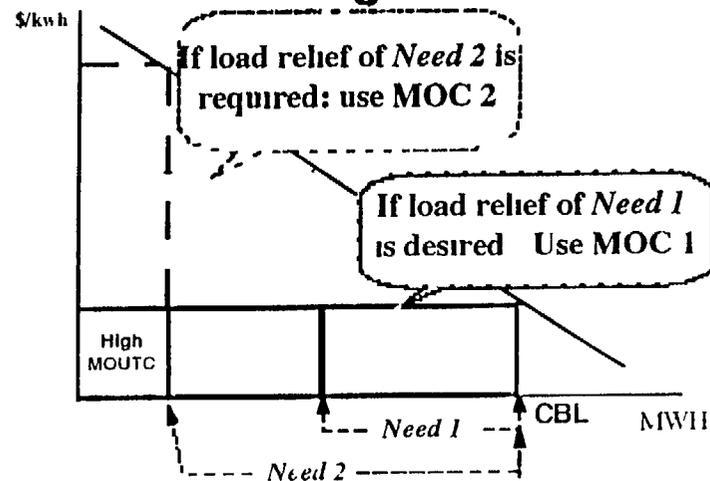
**A SPOT PRICE BASED ON THE MEC WOULD NOT SERVE TO RATION AVAILABLE SUPPLY AMONG COMPETING USERS, AND SUPPLY AND DEMAND WOULD BE OUT OF BALANCE**

## Marginal Outage Cost

### FOR THE STATE VARIABLE, OR LIBRARY, METHOD, MOC VALUES ARE DEVELOPED USING PRODUCTION COST SIMULATIONS AND HISTORIC DATA RELATIONSHIPS

- The MOC can be calculated in three steps
  - Develop specific combinations of system conditions
  - Establish their corresponding effect on system reliability
  - Associate each with a specific MOC
- Typical library elements include line loading conditions, weather and temperature conditions, and system sendout relative to peak

### Need/Response Relationships for Calculating the MOC



## Marginal Outage Cost

### **THE MAJOR ADVANTAGES OF THE LIBRARY METHOD ARE SIMPLICITY FOR SYSTEM OPERATOR AND FOR CUSTOMERS, THE RELATIVE EASE OF PREDICTING THE MOC**

- Downsides of the library method include
  - Reliability varies continuously, and this model does not pick up this factor
  - The MOC value will generally be either very high or almost nonexistent, giving skewed price signals to customers
  - Library MOCs may not correspond well with spot market prices or the finer adjustments for reliability that are likely to be found in bilateral contracts
  - The method is subject to misinterpretation, manipulation, and misapplication

**AN ALTERNATIVE METHOD, BASED ON THE CALCULATED LOSS OF LOAD PROBABILITY (LOLP)**

- The formula for calculating MOC is simply

$$\text{MOC} = \text{LOLP} \times \text{Avoided Capacity Cost}$$

Or alternately, the MOC can be calculated as

$$\text{MOC} = \frac{\Delta \text{ Expected Unserved Energy}}{\Delta \text{ Load}} \times \{ \text{Value of Load Lost} - \text{MEC} \}$$

- These advantages over the “library” method include
  - “True” engineering/economic representation of system state
  - Prices generally vary smoothly over hours, events
  - Price patterns vary predictably with observable conditions
  - Continuous variation provides subscribers with greater opportunities for response
  - Closest approximation to a true administered spot market operation
  - Well established in principle and practice in U S and elsewhere
- The drawbacks (which primarily apply to the second equation) include
  - Less discretion to the system operator
  - Reduced ability to market electricity using arbitrary pricing
  - Controversy about the value of the unserved energy figure

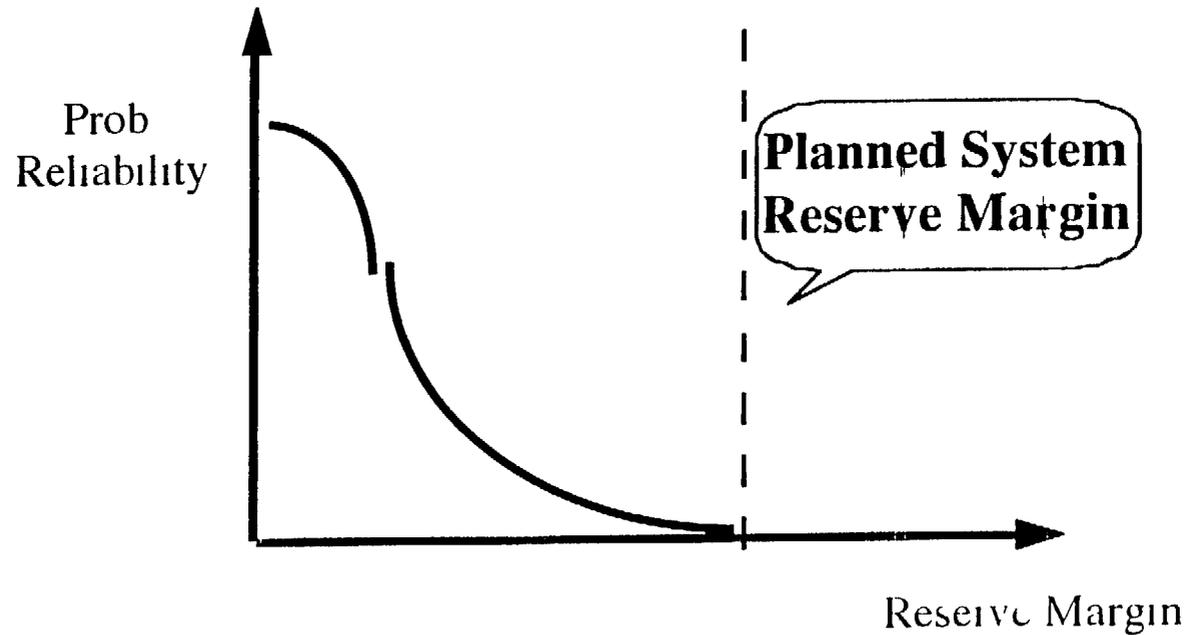
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**THE SPOT PRICING MODEL DEVELOPED FOR ELECTRICITY POOLS PROVIDES A SOLUTION TO THE RATIONING DILEMMA**

- The final spot price is that price that would result from a transaction market where buyers and sellers resolved the discrepancies using trades based on maximizing their positions
- There are two main methods of calculating MOC
  - Using data on past outage costs and applying them whenever certain state variables call for application of certain outage cost levels
  - Calculating the actual cost of the expected outage that is associated with a particular level of reserves

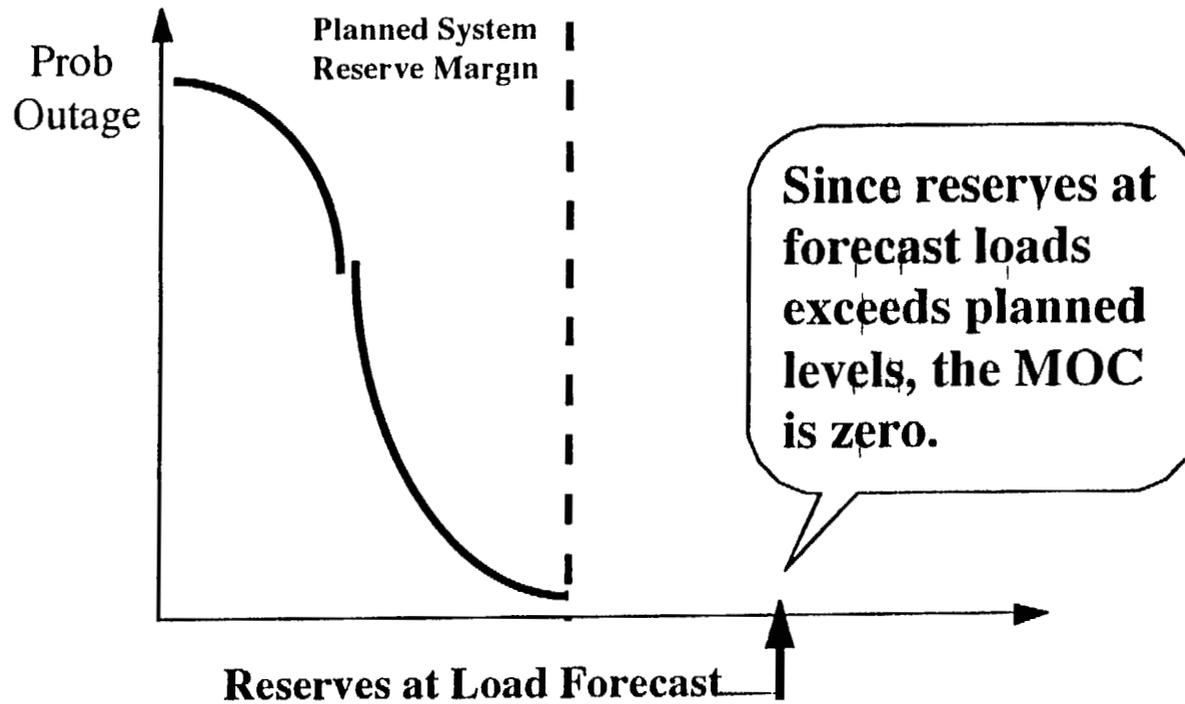
THE FOLLOWING FIGURES SHOW THE RELATIONSHIP BETWEEN THE PLANNED SYSTEM RESERVE MARGIN, THE PROBABILITY RELIABILITY OF THE SYSTEM, AND THE LOAD FORECAST

## LOLP Method Marginal Probability of an Outage



**IN THOSE CASES FOR WHICH THE LOAD FORECAST GIVES RESERVES THAT EXCEED PLANNED RESERVES, THE MOC WILL BE ZERO**

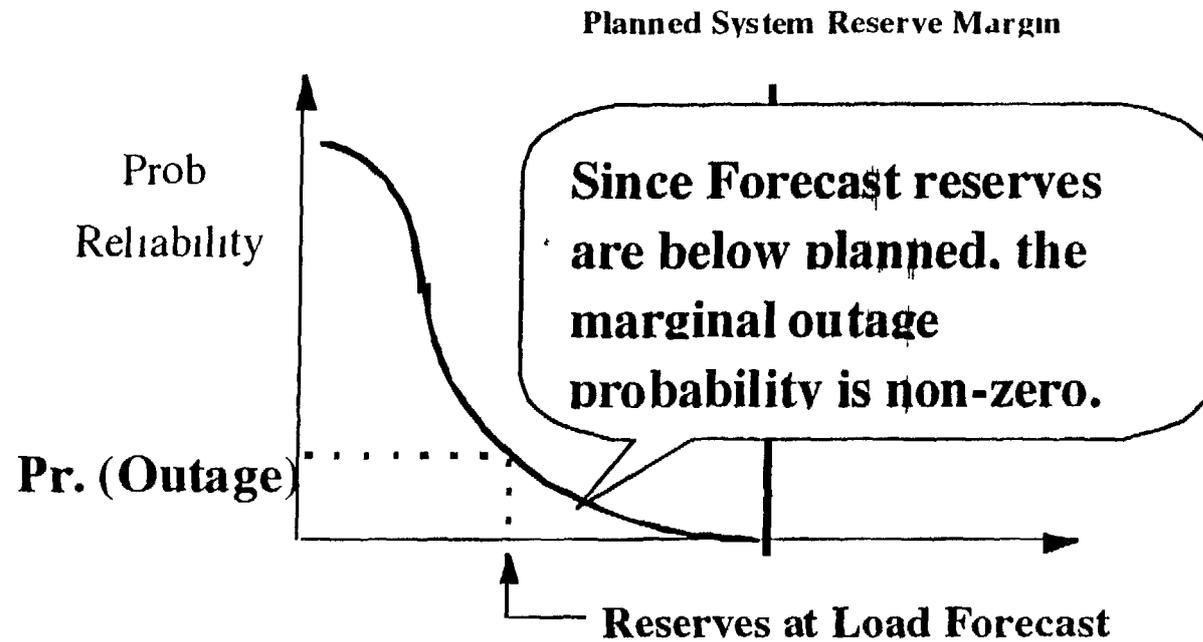
### The Case of MOC = Zero



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**IN THOSE CASES FOR WHICH THE FORECAST RESERVES AT A PARTICULAR HOUR ARE BELOW THE PLANNED RESERVES, THE MARGINAL OUTAGE PROBABILITY OR LOLP IS GREATER THAN 0 AND THEREFORE, THE MOC IS GREATER THAN 0**

### Non-Zero Outage Costs



# Appendix 10

Non-Price Factors,  
Dr. Douglas Bauer

## Non-Price Factors Dr Douglas Bauer

### *Service and Quality Performance Standards*

Loss of load probability

Design Criteria for transmission system

- Double contingency?

Power Quality (voltage, frequency)

Outage duration criteria

Customer service criteria (how long to respond to calls complaints etc )

Tailoring and unbundling services

Meeting customer objectives and recognizing customer constraints

### *Social Objectives*

Utilities as 'institutions affected with a public interest'

Looking, then, to the common law from whence came the right which the Constitution protects we find that when private property is affected with a public interest it ceases to be *juris privati* only

Britain's Lord Chief Justice Hale (1609-1676)

Cited in *Munn v Illinois* (1871) as the rationale for the right of the state to regulated prices charged to the public by a business 'affected with a public interest'

What are the "social objectives" in which utilities are typically involved?

#### Residential customers

- Avoidance of 'undue discrimination' ("fairness" or equity considerations)
- Low income programs (lifeline rates, standards on interruptibility for failure to pay bills, low income weatherization assistance programs, systems to facilitate contributions by more affluent ratepayers to pay costs of poorer customers)
- Assurance of equitable sharing with other customer classes of benefits of competition

#### Commercial/Industrial customers

- Industrial/commercial development (rates that for certain customers, may recover only variable costs plus nominal contributions to fixed costs)
- Tailored end use programs to enhance industrial/commercial productivity and competitiveness
- Revolving fund financed DSM demonstrations

Governmental/societal objectives (which utilities are expected to advance)

- Demand Side Management (DSM) and energy efficiency programs
- Development of renewable resources
- Environmental Protection
- Research and Development
- Fuel diversity
- Siting criteria

Responsibility for licensing, and how this regulatory function is managed

- Nuclear power plants (Nuclear regulatory commission)
- Certificate of Public Need and Necessity (for project approval as prudent)
- Siting processes (In Mass heads of Public Utility Commission  
Environmental Commission others)

Programs for clean energy, renewable energy and energy efficiency

- Integrated Resource Planning
- Emerging role of Markets in shaping generation choices
- Portfolio standard for renewable energy
- Green pricing
- Continued support of renewable and efficiency programs (but an end to rebates)
- Revolving Fund DSM Demonstration Projects
- Emission Caps and Tradable permits for SOX, NOX, GHGs
- DSM Needs Assessment Studies (China)
- DSM Liaison Group (APEC)

Role of Regulator in implementing government social policy (particularly price subsidies)

- Set up goals expectations but leave flexibility on *means* of attaining them
- Learn from experience (E.g. DSM has been an experimental journey in the U.S. Some programs worked others didn't. Issues extend from technology through program details and customer preferences)

Price subsidies

- make costs transparent – both accounting (historic) and marginal costs
- If there be subsidy, make its basis or rationale explicit
- Administer subsidies, as far as possible, outside the tariff system
- Avoid "unreasonable" discrimination

# Appendix 11

Case Study: Establishment  
of the Wholesale Market  
and their Role in  
Regulation, Dr. Donald  
Hertzmark

The purpose of this presentation is to lay out the form of the wholesale market and to set forth the rules for the transactions within that market. These rules and regulations will include both spot market transactions and free power purchase.

## Market Structure

### Generation-Side Issues

Some of the key generation-side issues represent different parts of the same questions.

- Fixing the proportion of the market that will be priced competitively v. that which will be priced in the “fixed” market is not independent from the organization of the generation side.
- The nature of bilateral contracts can vary greatly. Under the scheme proposed below, bilateral contracts will be at the heart of the restructured electricity transactions market and will be used to enhance the transition to a competitive market.
- Finally, providing a competitive and structurally compatible role for the Paute hydroelectric complex will go a long way toward mitigating the problems that are associated with constructing a market that accounts appropriately for the value of hydro output, especially for Paute-Masar.

The proposed structure of the wholesale market is intended to provide as great an incentive as possible to generation and distribution companies to become active in trading and contracting for capacity and energy on their own. Essentially, we envision the market to be organized and to operate under the following general rules:

- a) Four or five generation companies will be formed, each with thermal and hydro assets;
- b) Paute-Masar will be established as a private company, with shares equally divided among the four or five original generation companies and the government and unions, as specified in the Electricity Law;
- c) Paute-Masar will be dispatched by CENACE.<sup>1</sup> That is, the company will not be able to either flood the electricity market or to withhold its output in order to influence prices;
- d) New generation companies may be established by their owners around new generation assets

---

<sup>1</sup> Please note that CENACE acts in the role of the "independent system operator" or ISO. Therefore, documents or studies that refer to the ISO are applicable to CENACE and to its role in the restructured electricity market in Ecuador

but will be subject to the same pool rules as the other generation companies;

- e) Initially, the generation companies will sign bilateral contracts with the distribution companies equivalent to 90% of the distribution companies annual demand. The distribution companies will purchase electricity from at least three generation companies. The generation companies will obligate no more than 90% of their output, including their shares of Paute-Mazar, to bilateral contracts;
- f) The remainder of the generation companies' output will be sold to the pool. Output that goes to the pool will be either under contract to CENACE or will be purchased as peak, reserve, standby, reactive or other categories of services;
- g) For each relevant time period, CENACE will use the Marginal Energy Cost computed from

## **Competition Rules and Regulation of the Generation Market**

CONELEC will have significant powers during this transitional period. Its duties vis-à-vis the pool should include the following

1. review all bilateral contracts, retaining the ability to even up abusive contract terms;
2. oversee the rewrite of bilateral contracts after year 2;
3. retain the ability to speed up or slow down transition to pool purchases, as dictated by development of trading skills in distribution companies and generation companies and by the formation of new generation companies;
4. perform studies of contracting efficiencies and assessment of bid patterns for evidence of collusion or gaming of system;
5. provide advice to the government with regard to the competitiveness of the market and the ability to allow large

hydro installations to operate independently;

6. establish a bidding market for cold reserve, reactive power and, eventually peak power and other electricity supplies;
7. set out the types of electricity sales that are permitted in the system and associated rules.

## **Sales Options for Generation Companies and Associated Structural Issues**

In the system envisioned above, all of the generation companies and distribution companies, except Paute-Masar, would be able to engage in various forms of bilateral contracting. In particular, the generation companies and independent generators would find themselves with the following sales options.

1. sell to the pool
2. sell to distribution companies directly (bilateral contract)
3. sell to large customers directly (bilateral contract)
4. sell to another generation company to make up a shortage (bilateral contract)
5. sell to CENACE
6. make private arrangements with power brokers (contracts for differences)

## **Competition Rules Will Enable These Six Types of Electricity Sales To Be Made In A Manner That Is Best For Ecuador**

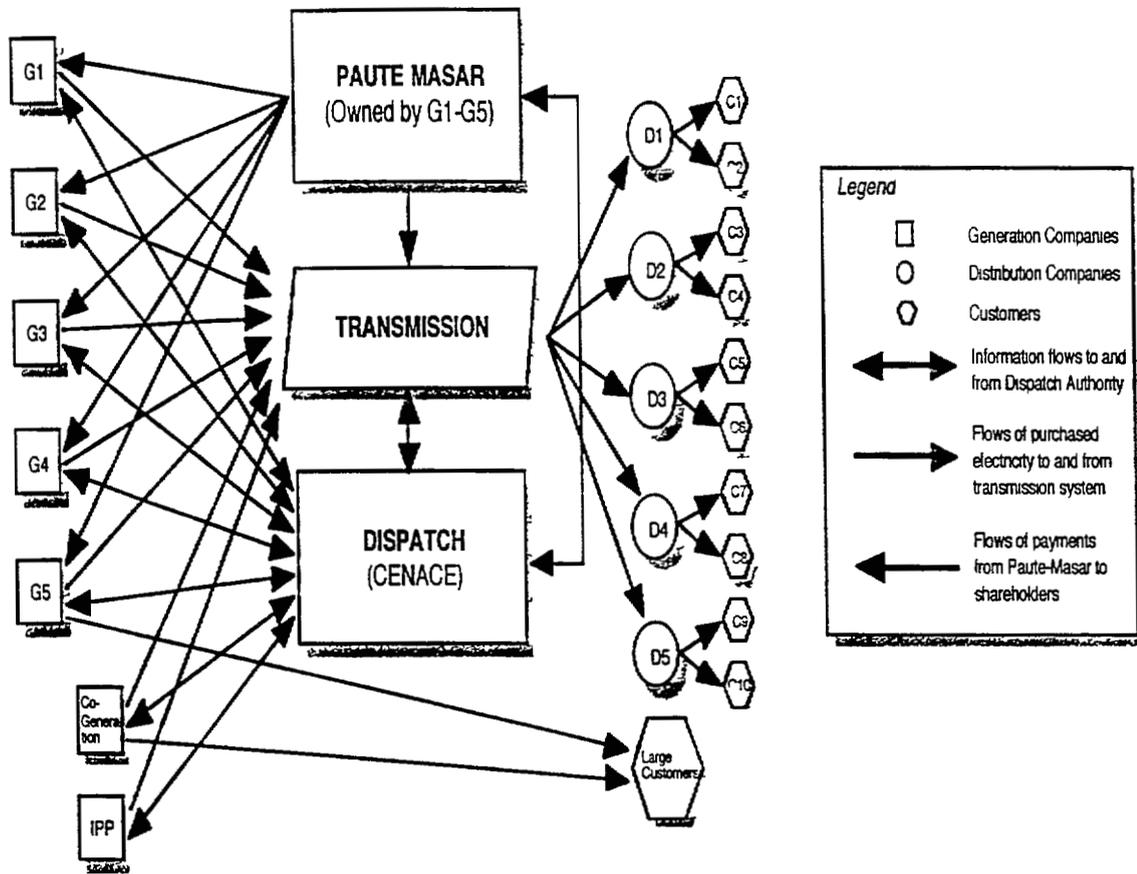
The desiderata for such sales contracts and agreements includes, at a minimum the following:

- low transactional costs;
- a high degree of competition;
- a forum for redress of competitive or contractual problems.

The consultant has looked at the type of competitive environment that would best foster an efficient transition to a competitive power market. We have tried to remain mindful of the particulars of the Ecuadorian situation, both with regard to the dependence on hydro and to the relatively small size of the system. It is envisioned that the regulator, CONELEC, will provide a set of competition rules with the following elements:

- publicly posting of all MECs and MOCs daily for the next day's trading
- maintaining a registry of all bilateral contracts, including contracts for differences
- providing rules for dispatch and regulation of Paute-Masar
- overseeing and adjusting the proportions of individual generation company output that will go to individual distribution companies and vice-versa
- publish least cost simulation results annually
- dispute resolution fora to adjudicate disputes between parties

# Electricity, Money and Information Flows



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## **Assuring competition in the generation market and providing a positive, competitive role for Paute-Masar**

One of the signal difficulties in the current structure of electricity generation in Ecuador is the dominant role played by the Paute plant. Even with planned additions to the system, the addition of the Masar dam and its storage will keep Paute at its current share of the capacity market, about 37-38%, for the next few years. For the transition period foreseen in this project, the Paute complex will dominate the landscape in Ecuador's electric power system.

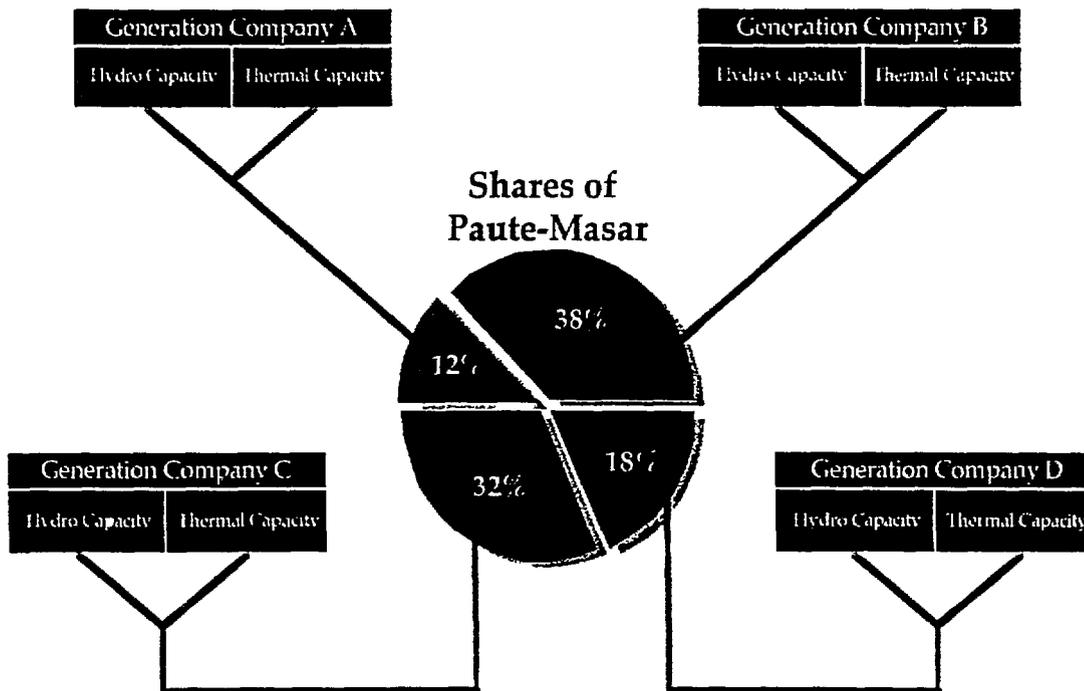
Since the Paute complex represents such a large proportion of both investment and generation capacity, obtaining the greatest degree of performance from the complex will be essential to realizing the potential economic gains from power sector restructuring. We propose then, that the Paute complex be organized as a private generation company with ownership to be allocated among the four or five other generation companies, as well as to the unions and the government in a manner consistent with the divestiture and ownership provisions of the Electricity Law.

Under such a system, each generation company initially formed would be allocated a share of Paute that was equal to its firm capacity as a proportion of non-Paute firm capacity in the system overall. The sale price of the generation company would then represent the value of Paute as well as whatever other thermal or hydro capacity the company was purchased by the investor in the restructuring. Such an allocation would serve to stabilize the sale prices of the prospective generation companies, since none of them should be vulnerable to predatory actions by an independent Paute company. Dispatch of Paute would be given to CENACE and the plant would be run so as to maximize the value of output from the complex. In other words, Paute-Masar would normally be the first plant dispatched but water would be retained in a manner consistent with an overall least cost operation of the electric power system. Such a mode of operation would help to stabilize the price of electricity and might obviate the perceived necessity for maintaining a price stabilization fund for electricity.

Over time, perhaps six years or more, the electricity market might expand enough that the share of Paute

would fall to 25% or less. If that occurs, then it is conceivable that the plant could be spun off from the other generation companies. However, as long as Paute is so large a proportion of the total generation capacity, it makes sense to shield the emerging electricity market from such a concentration of power

## Allocating Paute-Masar to Newly Formed Generation Companies.

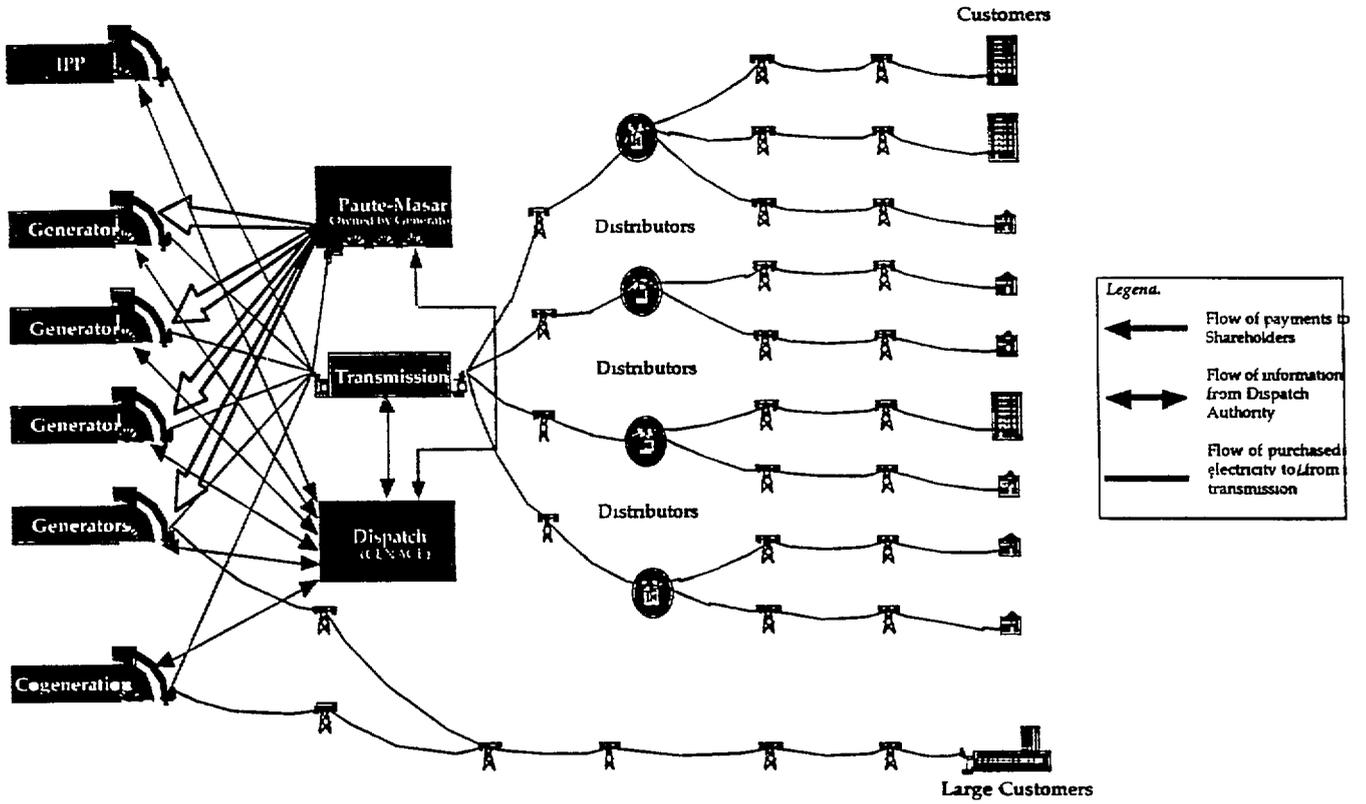


The flows from Paute-Masar to the various generation companies are money flows only. That is, the Paute-Masar company does not act independently in the market. The various shareholders cannot direct the company to provide electricity to its own bilateral customers. However, the shareholders may take account of their share of Paute-Masar when determining the deliverability of electricity to bilateral customers.

How to allocate shares in Paute-Masar to the newly-formed generation companies?

1. Sum up each of the newly-formed generation companies' *firm* capacities without Paute-Masar;
2. Add these figures together and allocate shares of Paute-Masar on the basis of the proportion of firm capacity held by each firm;
3. In the flotation of the shares in the newly-formed generation companies, Paute-Masar will be given an implicit value that will be returned to INECEL as its share of overall privatization receipts.

# Transaction and Information Flows



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# Appendix 12

Notification to Constitute  
WBSERC, January 06, 199

Government of West Bengal  
 Department of Power  
 New Secretariat Buildings  
 1, K. S. Roy Rd., 7th fl.,  
 Block-A, Calcutta-700 001.

No.06-Power/III

Dated Calcutta, the 6th January, 1999.

N O T I F I C A T I O N

In exercise of the power conferred by Sub-Section-1 of Sec.17 of the Electricity Regulatory Commission's Act, 1998, (No.14 of 1998) the Governor has been pleased to constitute the West Bengal ~~Electricity~~ Electricity Regulatory Commission.

The Commission shall consist of three members including the Chair-person to be appointed by the State Government in terms of provision of Sec.17 (6) and (7) of the Act.

The Commission shall discharge the powers and functions as conferred to it in the Electricity Regulatory Commission's Act, 1998 and any other functions the Government of West Bengal may notify further from time to time.

The head office of the Commission shall be in Calcutta, West Bengal.

The Commission shall be a body corporate by name aforesaid, having perpetual succession and a common seal with power to acquire hold and dispose of property, both movable and immovable and to contract and shall by the said name, sue or be sued.

The Chairperson of the Commission shall be the Chief Executive of the said Commission.

BY ORDER OF THE GOVERNOR

S. BARMA

Secretary to the Govt. of W.Bengal

*LB*

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# Appendix 13

The Electricity Regulatory  
Commission Act, 1998



**भारत का राजपत्र**  
**The Gazette of India**

असाधारण  
EXTRAORDINARY  
भाग II — खण्ड 1  
PART II — Section 1  
प्राधिकार से प्रकाशित  
PUBLISHED BY AUTHORITY

सं 29] नई दिल्ली, बुधवार, जुलाई 2, 1998 / आषाढ 11, 1920  
No. 29] NEW DELHI, THURSDAY, JULY 2, 1998 / Asadha 11, 1920

इस भाग में भिन्न पृष्ठ सजा दो जाते हैं जिससे कि यह अलग सकलन क रूप में रखा जा सक।  
Separate paging is given to this Part in order that it may be filed as a separate compilation.

**MINISTRY OF LAW, JUSTICE AND COMPANY AFFAIRS**  
(Legislative Department)

*New Delhi, the 2nd July 1998/Asadha 11, 1920 (Saka)*

The following Act of Parliament received the assent of the President on the 2nd July 1998 and is hereby published for general information—

**THE ELECTRICITY REGULATORY COMMISSIONS ACT, 1998**

**No. 14 OF 1998**

[2nd July 1998]

An Act to provide for the establishment of a Central Electricity Regulatory Commission and State Electricity Regulatory Commissions, rationalization of electricity tariff, transparent policies regarding subsidies, promotion of efficient and environmentally benign policies and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Forty-ninth Year of the Republic of India as follows —

**CHAPTER I**

**PRELIMINARY**

1. (1) This Act may be called the Electricity Regulatory Commissions Act, 1998
- (2) It extends to the whole of India except the State of Jammu and Kashmir.
- (3) It shall be deemed to have come into force on the 25th day of April, 1998.

Short title, e.  
text and corr.  
modification.

(2) The Central Commission shall be a body corporate by the name aforesaid having perpetual succession and a common seal with power to acquire hold and dispose of property both movable and immovable and to contract and shall by the said name sue or be sued

(3) The head office of the Central Commission shall be at such place as the Central Government may by notification in the Official Gazette specify

(4) The Central Commission shall consist of the following Members namely —

(a) a Chairperson and three other Members

(b) the Chairman of the Central Electricity Authority appointed under sub-section (3) of section 3 of the Electricity (Supply) Act 1948 who shall be the Member, *ex officio*

(5) The Chairperson and the other Members of the Central Commission shall be appointed by the Central Government on the recommendation of the Selection Committee referred to in section 5

Provided that nothing contained in this sub-section shall apply to the appointment of a person as the Chairperson, where such person is or has been a Judge of the Supreme Court or the Chief Justice of a High Court

4 (1) The Chairperson and the Members of the Central Commission shall be persons having adequate knowledge experience or shown capacity in dealing with problems relating to engineering, law, economics commerce finance or management and shall be appointed in the following manner, namely —

(a) one person having qualification and experience in the field of engineering with specialisation in generation, transmission or distribution of electricity,

(b) one person having qualification and experience in the field of finance and

(c) two persons having qualification and experience in the field of economics commerce law or management

Provided that not more than one Member shall be appointed under the same category under clause (c)

(2) Notwithstanding anything contained in sub-section (1), the Central Government may appoint any person as the Chairperson from amongst persons who is or has been a Judge of the Supreme Court or the Chief Justice of a High Court

Provided that no appointment under this sub-section shall be made except after consultation with the Chief Justice of India.

(3) The Chairperson or any other Member of the Central Commission shall not hold any other office

(4) The Chairperson shall be the Chief Executive of the Central Commission

5 (1) The Central Government shall for the purpose of sub-section (5) of section 3 constitute a Selection Committee consisting of—

- |                                                                                                                |              |
|----------------------------------------------------------------------------------------------------------------|--------------|
| (a) Member of the Planning Commission incharge of the energy sector                                            | —Chairperson |
| (b) Secretary-in-charge of the Ministry of the Central Government dealing with the Department of Legal Affairs | —Member;     |
| (c) Chairman of the Public Enterprises Selection Board                                                         | —Member;     |
| (d) a person to be nominated by the Central Government in accordance with sub-section (2)                      | —Member      |
| (e) a person to be nominated by the Central Government in accordance with sub-section (3)                      | —Member;     |
| (f) Secretary-in-charge of the Ministry of the Central Government dealing with Power                           | —Member      |

Qualification for appointment of Chairperson and other Members of Central Commission.

Constitution of Selection Committee to recommend Members.

1948

(b) not accept any commercial employment for a period of two years from the date he ceases to hold such office and

(c) not represent any person before the Central Commission or a State Commission in any manner

*Explanation.*— For the purposes of this sub-section,—

(i) "employment under the Central Government or the State Government" includes employment under any local or other authority within the territory of India or under the control of the Central Government or State Government or under any corporation or society owned or controlled by the Government.

(ii) "commercial employment" means employment in any capacity under or agency of, a person engaged in trading, commercial, industrial or financial business in the electricity industry and includes also a director of a company or partner of a firm and it also includes setting up practice either independently or as partner of a firm or as an adviser or a consultant.

7. (1) Subject to the provisions of sub-section (3), any Member of the Central Commission shall only be removed from his office by order of the President on the ground of proved misbehaviour after the Supreme Court, on reference being made to it by the President, has, on an inquiry, held in accordance with the procedure prescribed in this behalf by the Supreme Court, reported that the Member, ought on any such ground to be removed.

Removal of  
Members.

(2) The President may suspend any Member of the Central Commission in respect of whom a reference has been made to the Supreme Court under sub-section (1) until the President has passed an order on receipt of the report of the Supreme Court.

(3) Notwithstanding anything contained in sub-section (1), the President may by order remove from office the Chairperson or any other Member if the Chairperson or such other Member, as the case may be,—

(a) has been adjudged an insolvent, or

(b) has been convicted of an offence which, in the opinion of the Central Government, involves moral turpitude, or

(c) has become physically or mentally incapable of acting as a Member or

(d) has acquired such financial or other interest as is likely to affect prejudicially his functions as a Member; or

(e) has so abused his position as to render his continuance in office prejudicial to the public interest.

(4) Notwithstanding anything contained in sub-section (3), no Member shall be removed from his office on the ground specified in clause (d) or clause (e) of that sub-section unless the Supreme Court, on a reference being made to it in this behalf by the President, has, on an inquiry, held by it in accordance with such procedure as prescribed in this behalf by the Supreme Court, reported that the Member ought on such ground or grounds to be removed.

8. (1) The Central Commission may appoint a Secretary to exercise and perform under the control of the Chairperson such powers and duties as may be specified by regulations made by the Central Commission

Officers of  
Central  
Commission  
and other staff

(2) The Central Commission may, with the approval of the Central Government determine the number, nature and categories of other officers and employees required to assist the Central Commission in the discharge of its functions

(3) The salaries and allowances payable to, and other conditions of service of the Secretary, officers and other employees shall be such as may be determined with the approval of the Central Government, by regulations

(b) to regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause (a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State.

(c) to regulate the inter-State transmission of energy including tariff of the transmission utilities,

(d) to promote competition efficiency and economy in the activities of the electricity industry,

(e) to aid and advise the Central Government in the formulation of tariff policy which shall be—

(i) fair to the consumers, and

(ii) facilitate mobilisation of adequate resources for the power sector;

(f) to associate with the environmental regulatory agencies to develop appropriate policies and procedures for environmental regulation of the power sector;

(g) to frame guidelines in matters relating to electricity tariff,

(h) to arbitrate or adjudicate upon disputes involving generating companies or transmission utilities in regard to matters connected with clauses (a) to (c) above,

(i) to aid and advise the Central Government on any other matter referred to the Central Commission by that Government.

14. (1) The Central Commission may, by notification, establish with effect from such date as it may specify in such notification a Committee to be known as the Central Advisory Committee

Central  
Advisory  
Committee.

(2) The Central Advisory Committee shall consist of not more than thirty-one members to represent the interests of commerce, industry, transport, agriculture, labour consumers non-governmental organisations and academic and research bodies in the energy sector

(3) The Chairperson and Members of the Central Commission shall be the *ex officio* Chairperson and *ex officio* Members of the Central Advisory Committee

15 The objects of the Central Advisory Committee shall be to advise the Central Commission on,—

Objects of  
Central  
Advisory  
Committee.

(i) major questions of policy,

(ii) matters relating to quality, continuity and extent of service provided by the licensees,

(iii) compliance by the licensees with the conditions and requirements of their licence,

(iv) protection of consumer interest, and

(v) energy supply and overall standards of performance by utilities

16. (1) Any person aggrieved by any decision or order of the Central Commission may file an appeal to the High Court.

Appeal to High  
Court in  
certain  
cases.

(2) Except as aforesaid no appeal or revision shall lie to any court from any decision or order of the Central Commission

(3) Every appeal under this section shall be preferred within sixty days from the date of communication of the decision or order of the Central Commission to the person aggrieved by the said decision or order

Provided that the High Court may entertain an appeal after the expiry of the said period of sixty days if it is satisfied that the aggrieved person had sufficient cause for not preferring the appeal within the period of sixty days

(6) Before recommending any person for appointment as a Member the Selection Committee shall satisfy itself that such person does not have any financial or other interest which is likely to affect prejudicially his functions as a Member

19 (1) The Chairperson or other Member shall hold office as such for a term of five years from the date on which he enters upon his office but shall not be eligible for reappointment

Term of office,  
Salary and  
allowances and  
other  
conditions of  
service of  
Chairperson  
and Members

Provided that no Chairperson or other Member shall hold office as such after he has attained —

(a) in the case of the Chairperson, the age of sixty-five years, and

(b) in the case of any other Member, the age of sixty-two years

(2) The salary and allowances payable to, and the other terms and conditions of service of the Members of the State Commission shall be such as may be prescribed by the State Government.

(3) The salary, allowances and other conditions of service of the Members, shall not be varied to their disadvantage after appointment.

(4) Every Member of the State Commission shall before entering upon his office, make and subscribe to an oath of office and of secrecy in such form and in such manner and before such authority as may be prescribed

(5) Notwithstanding anything contained in sub-section (1) or sub-section (2), a Member may—

(a) relinquish his office by giving in writing to the Governor notice of not less than three months, or

(b) be removed from his office in accordance with the provisions of section 20

(6) Any Member ceasing to hold office as such shall—

(a) be ineligible for further employment under the Central Government or any State Government for a period of two years from the date he ceases to hold such office;

(b) not accept any commercial employment for a period of two years from the date he ceases to hold such office, and

(c) not represent any person before the Central Commission or State Commission in any manner

*Explanation.*—For the purposes of this sub-section,—

(i) "employment under the Central Government or under the State Government" includes employment under any local or other authority within the territory of India or under the control of the Central Government or a State Government or under any corporation or society owned or controlled by the Government.

(ii) "commercial employment" means employment in any capacity under, or agency of, a person engaged in trading, commercial, industrial or financial business in the electricity industry and includes also a director of a company or partner of a firm and it also includes setting up practice either independently or as partner of a firm or as an adviser or a consultant.

20. (1) Subject to the provisions of sub-section (3), any Member of the State Commission shall only be removed from his office by order of the Governor on the ground of proved misbehaviour after the High Court, on reference being made to it by the Governor has, on inquiry, held in accordance with the procedure prescribed in that behalf by the High Court, reported that the Member, ought on any such ground to be removed

Removal of  
Members.

(b) in sub-section (3) of section 9 the brackets and words (including the Member *ex officio*) shall be omitted

State Advisory  
Committee.

24. (1) The State Commission may, by notification establish with effect from such date as it may specify in such notification a Committee to be known as the State Advisory Committee

(2) The State Advisory Committee shall consist of not more than twenty-one members to represent the interests of commerce, industry, transport, agriculture, labour, consumers, non-governmental organisations and academic and research bodies in the energy sector

(3) The Chairperson and the Members of the State Commission shall be *ex officio* Chairperson and *ex officio* Members of the State Advisory Committee.

Objects of  
State Advisory  
Committee.

25. The objects of the State Advisory Committee shall be to advise the Commission on—

(i) major questions of policy,

(ii) matters relating to quality, continuity and extent of service provided by the licensees,

(iii) compliance by licensees with the conditions and requirements of their licence,

(iv) protection of consumer interest, and

(v) energy supply and overall standards of performance by utilities.

Representation  
before State  
Commission.

26. The State Commission shall authorise any person as it deems fit to represent the interest of the consumers in all the proceedings before it.

Appeal to High  
Court in certain  
cases.

27. (1) Any person aggrieved by any decision or order of the State Commission may file an appeal to the High Court.

(2) Except as aforesaid, no appeal or revision shall lie to any court from any decision or order of the State Commission

(3) Every appeal under this section shall be preferred within sixty days from the date of communication of the decision or order of the State Commission to the person aggrieved by the said decision or order

Provided that the High Court may entertain an appeal after the expiry of the said period of sixty days if it is satisfied that the aggrieved person had sufficient cause for not preferring the appeal within the said period of sixty days

## CHAPTER VI

### ENERGY TARIFF

Determination  
of tariff by  
Central  
Commission.

28. The Central Commission shall determine by regulations the terms and conditions for fixation of tariff under clauses (a), (b) and (c) of section 13, and in doing so, shall be guided by the following, namely —

(a) the generating companies and transmission entities shall adopt such principles in order that they may earn an adequate return and at the same time that they do not exploit their dominant position in the generation, sale of electricity or in the inter-State transmission of electricity,

(b) the factors which would encourage efficiency, economical use of the resources, good performance optimum investments and other matters which the Central Commission considers appropriate,

(c) national power plans formulated by the Central Government, and

54 of 1948

(d) such financial principles and their applications contained in Schedule VI to the Electricity (Supply) Act, 1948 as the Commission considers appropriate

29. (1) Notwithstanding anything contained in any other law, the tariff for intra-State transmission of electricity and the tariff for supply of electricity, grid, wholesale bulk or retail, as the case may be, in a State (hereinafter referred to as the "tariff" shall be subject to the provisions of this Act and the tariff shall be determined by the State Commission of that State in accordance with the provisions of this Act.

Determination  
of tariff by  
State  
Commission.

(2) The State Commission shall determine by regulations the terms and conditions for the fixation of tariff, and in doing so, shall be guided by the following, namely —

54 of 1948

(a) the principles and their applications provided in sections 46, 57 and 57A of the Electricity (Supply) Act, 1948 and the Sixth Schedule thereto,

54 of 1948

(b) in the case of the Board or its successor entities, the principles under section 59 of the Electricity (Supply) Act, 1948,

(c) that the tariff progressively reflects the cost of supply of electricity at an adequate and improving level of efficiency,

(d) the factors which would encourage efficiency, economical use of the resources, good performance, optimum investments, and other matters which the State Commission considers appropriate for the purposes of this Act,

(e) the interests of the consumers are safeguarded and at the same time the consumers pay for the use of electricity in a reasonable manner based on the average cost of supply of energy,

(f) the electricity generation, transmission, distribution and supply are conducted on commercial principles;

(g) national power plans formulated by the Central Government.

(3) The State Commission, while determining the tariff under this Act, shall not show undue preference to any consumer of electricity, but may differentiate according to the consumer's load factor, power factor, total consumption of energy during any specified period or the time at which the supply is required or the geographical position of any area, the nature of supply and the purpose for which the supply is required

(4) The holder of each licence and other persons including the Board or its successor body authorised to transmit, sell, distribute or supply electricity wholesale, bulk or retail in the State shall observe the methodologies and procedures specified by the State Commission from time to time in calculating the expected revenue from charges which he is permitted to recover and in determining tariffs to collect those revenues

(5) If the State Government requires the grant of any subsidy to any consumer or class of consumers in the tariff determined by the State Commission under this section the State Government shall pay the amount to compensate the person affected by the grant of subsidy in the manner the State Commission may direct, as a condition for the license or any other person concerned to implement the subsidy provided for by the State Government.

54 of 1948

(6) Notwithstanding anything contained in sections 57A and 57B of the Electricity (Supply) Act, 1948 no rating committee shall be constituted after the date of commencement of this Act and the Commission shall secure that the licensees comply with the provisions of their licence regarding the charges for the sale of electricity both wholesale and retail

thereon shall be forwarded annually to the State Government by the State Commission and the State Government shall cause the audit report to be laid, as soon as may be after it is received, before the State Legislature

35. (1) The Central Commission shall prepare once every year, in such form and at such time as may be prescribed, an annual report giving a summary of its activities during the previous year and copies of the report shall be forwarded to the Central Government.

Annual re-  
of Centra-  
Commissi-

(2) A copy of the report received under sub-section (1) shall be laid, as soon as may be after it is received, before each House of Parliament.

36. (1) The State Commission shall prepare once every year in such form and at such time as may be prescribed, an annual report giving a summary of its activities during the previous year and copies of the report shall be forwarded to the State Government.

Annual re-  
of State  
Commissi-

(2) A copy of the report received under sub-section (1) shall be laid, as soon as may be after it is received, before the State Legislature

## CHAPTER VIII

### MISCELLANEOUS

37. The Commissions shall ensure transparency while exercising their powers and discharging their functions.

Transparen-  
in Commis-  
sions.

38. (1) In the discharge of its functions, the Central Commission shall be guided by such directions in matters of policy involving public interest as the Central Government may give to it in writing

Directions t  
Central  
Government

(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the Central Government thereon shall be final.

39. (1) In the discharge of its functions, the State Commission shall be guided by such directions in matters of policy involving public interest as the State Government may give to it in writing

Directions b  
State  
Government

(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the State Government thereon shall be final

40. The Chairperson, Members, officers and other employees of the Commissions shall be deemed when acting or purporting to act in pursuance of any of the provisions of this Act, to be public servants within the meaning of section 21 of the Indian Penal Code

Members,  
officers and  
employees of  
Central  
Commission t  
be public  
servants.

41. The provisions of this Act in so far as they relate to the State Commission shall not apply to the Commissions established under the Orissa Electricity Reform Act, 1995 or the Haryana State Electricity Reform Act, 1997

Special  
provision  
relating to the  
Orissa  
Electricity  
Reform Act,  
1995 or  
Haryana State  
Electricity  
Reform Act,  
1997

42. All proceedings before the Commission shall be deemed to be judicial proceedings within the meaning of sections 193 and 228 of the Indian Penal Code and the Commission shall be deemed to be a civil court for the purposes of sections 345 and 346 of the Code of Criminal Procedure 1973

Proceedings  
before  
Commission.

45 of 1860

45 of 1860

2 of 1974

100

48 No court shall take cognizance of an offence punishable under this Act except upon a complaint in writing made by the Commission or by any other officer duly authorised by the Commission for this purpose.

Cognizance of offences

49 Nothing contained in this Act or any rule or regulation made thereunder or any instrument having effect by virtue of this Act rule or regulation shall have effect in so far as it is inconsistent with any other provisions of the Consumer Protection Act 1986 or the Atomic Energy Act, 1962.

Inconsistency in laws

68 of 1986  
31 of 1962.

50 The Central or the State Commission may, by general or special order in writing delegate to any Members officer of the Central or the State Commission or any other person subject to such conditions, if any, as may be specified in the order such of its powers and functions under this Act (except the power to settle disputes under Chapters III and V and the power to make regulations under section 55 or section 58) as it may deem necessary

Delegation.

51. With effect from such date as the Central Government may by notification in the Official Gazette appoint sub-section (2) of section 43A of the Electricity (Supply) Act 1948 shall be omitted

Amendment of Act 54 of 1948

Provided that different dates may be appointed for different States

52. Save as otherwise provided in section 49 the provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any enactment other than this Act.

Overriding effect

53. The Central Government may give directions to a State Government as to the carrying out into execution of this Act in the State

Power to give directions.

54. (1) The Central Government may by notification in the Official Gazette make rules for carrying out the purposes of this Act.

Power of Central Government to make rules

(2) In particular and without prejudice to the generality of the foregoing power such rules may provide for all or any of the following matters namely —

(a) the salary and allowances payable to and the other conditions of service of the Chairperson and Members under sub-section (2) of section 6,

(b) the form and the manner in which and the authority before whom oath of office and secrecy should be subscribed under sub-section (4) of section 6

(c) the form in which and the time at which the Central Commission shall prepare its budget under section 31,

(d) the form in which annual statement of accounts to be prepared by the Central Commission under sub-section (1) of section 32,

(e) the form and the time within which annual report should be filed under sub-section (1) of section 35,

(f) any other matter which is to be or may be, prescribed or in respect of which provision is to be made by rules

55. (1) The Central Commission may, by notification in the Official Gazette make regulations consistent with this Act and the rules generally to carry out the purposes of this Act

Power of Central Commission to make regulations

(2) In particular and without prejudice to the generality of the foregoing power such regulations may provide for all or any of the following matters namely —

(a) the powers and duties of the Secretary under sub-section (1) of section 8

(b) the salaries allowances and other conditions of service of the Secretary officers and other employees under sub-section (3) of section 8

(c) the terms and conditions of the consultants appointed under sub-section (4) of section 8

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Inconsistency in laws

68 of 1986  
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(b) the salaries allowances and other conditions of service of the Secretary officers and other employees under sub-section (3) of section 8

(c) the terms and conditions of the consultants appointed under sub-section (4) of section 8

60. (1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government may by order published in the Official Gazette make such provisions not inconsistent with the provisions of this Act as may appear to be necessary for removing the difficulty

Power to remove difficulties

Provided that no order shall be made under this section after the expiry of two years from the date of commencement of this Act.

(2) Every order made under this section shall be laid as soon as may be after it is made before each House of Parliament

Ord.  
14 of 1998

61 (1) The Electricity Regulatory Commissions Ordinance 1998 is hereby repealed.

Repeal and saving

(2) Notwithstanding such repeal anything done or any action taken under the said Ordinance shall be deemed to have been done or taken under the corresponding provisions of this Act.

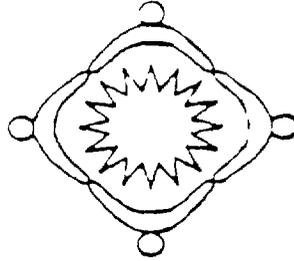
RAGHBIR SINGH  
Secy to the Govt of India.

# Appendix 14

## Conceptual Issues of Electricity Tariff in Orissa

# **CONCEPTUAL ISSUES OF ELECTRICITY TARIFF IN ORISSA**

**ORISSA ELECTRICITY REGULATORY COMMISSION  
BHUBANESWAR - 751 012.**



Together Let us light up our lives

# **ISSUES OF ELECTRICITY TARIFF IN ORISSA**

This consultation paper has been prepared by the OERC after discussion with Gndco and with economists, industry associations, power professionals and consumer groups.

**AUGUST 1998**

**BHUBHONESWAR**

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Issue No 1 System of Accounts

(Licensee to institute a system of accounts using recognised accounting standards)

The licensees have to adopt a proper system of accounts and accounting procedures based on international standard which will help developing operational economic and financial data on cost, consumption and other relevant variables. These data shall enable the Commission to regulate the tariffs of the licensees effectively, while protecting consumers' interest.

The Commission prepared and issued an extensive set of filing requirements entitled "Guidelines for Revision of Tariffs" and "Procedure for Tariff" for Gridco's 1997-98 tariff filings. Though Gridco has expressed its inability to meet the accounting and data requirements of the Commission till the end of 1999, it should not be difficult to furnish the same for future tariff filings. The Commission shall consider the future filings once the said data requirements are met.

Issue No 2 Reduction of Subsidy and Cross Subsidy

(Licensee to reduce and eliminate subsidies and cross-subsidies in existing tariffs, meet power quality standards (reliability, voltage, stability, etc) reduce losses, technical and non-technical (theft), and install new and upgraded metering)

Perhaps the most pressing need for reform in the electricity industry in the state comes in the areas of cross-subsidisation, quality of power, reduction of losses and metering of customer's consumption apart from the accounting system. While cross-subsidisation is still in operation, undoubtedly there is scope for improving quality of power supply and reducing transmission and distribution losses. Moreover price increases should be accompanied by improvement in the quality of power. Losses threaten the licensee's financial health and keep prices unnecessarily high to the paying consumers. Estimates of unmetered consumption are a poor substitute for actual charges based on meter reading and inhibit the Commission's ability to ensure that the licensee is receiving the proper amount of revenue from the customers. Further lack of time-of-use metering limits the Commission's ability to examine whether prices incorporate incentive or disincentive based on the usage of the electricity by the customer during the peak or off-peak hours. These problem areas affect the commercial viability of the electricity sector as well as consumers' satisfaction adversely and, therefore, need to be tackled soon.

While the Commission could develop ideal standards of performance and impose them on the licensee, it is incumbent on the latter to develop appropriate plans and present them to the Commission for consideration. Such an approach sharpens the licensee's expertise and experience in these areas and brings it to the Commission's scrutiny and also assures the consumers about the steps taken or contemplated to be taken on the matter. The Commission, therefore, provided in a tariff guidance document that the licensee develops a plan for reduction of losses within a specified time period and file it with the Commission for review and possible revision.

Efficiency criterion requires that tariff should be cost-based without any cross-subsidisation. It also has minimum T&D loss and effective metering as the base. Gridco has agreed to reduce the level of cross-subsidisation over a period of time and should file a loss reduction programme. It has already submitted the performance standards for the approval of the Commission. Gridco however, feels that upgrading the status of metering to efficient levels will take time and require considerable amount of investment. In any case the consumers should not be penalised for the inefficiency of the licensee. For instance, the licensee should not be allowed to collect energy charges without providing required level of service. The licensee should institute time-of-day metering. Any subsidy programme should mandatorily be financed by the Government in the annual budget.

Issue No 3 Determination of Revenue Requirement

(How will a licensee's basic overall revenue requirements be determined)

There are three approaches to determine overall revenue requirements viz actual historic accounting costs, estimated future accounting costs and estimated marginal costs. Actual historic accounting costs have the virtue of being susceptible to audit if they are taken from the books and records of the licensee. Also the overall revenue requirements of a licensee would be fairly stable from year to year using this type of cost as the basis for revenue determination.

However, since tariffs are set to be effective in some future time period and the level of costs incurred in a past test period may not correspond with costs expected to be incurred during that future period, it may be more appropriate to use a forward-looking Test Year as the basis for revenue requirement determination. The Test Year revenue requirement is estimated based upon actual past cost levels adjusted for inflation and known and measurable changes in the future.

In a competitive market all participants receive total revenues based upon the marginal costs of the marginal producer. No guarantee is made that any participant will be able to earn its total costs as is generally the case under regulation. Thus efficient regulation would require use of marginal costs in setting revenue requirements. However, use of marginal costs for this purpose raises a number of practical problems. Revenue derived by charging full marginal costs as prices can significantly fluctuate from year to year and consumers may find the resulting fluctuation in the tariff difficult to understand. Secondly estimation of marginal costs is itself a difficult task and requires time.

While the Commission recognizes the benefits of tariffs that reflect current costs, either through the use of a Future Test Year or marginal costs, it appreciates the desirability of being able to audit historical accounting costs and the stability of the resulting tariffs. Therefore, the Commission proposes to utilize the current Sixth Schedule RoR methodology and the requirements to meet specified performance standards. Gridco agrees with the conclusion reached by the Commission to utilize the current Sixth Schedule RoR methodology to determine revenue requirements. In any case revenue required is a function of variables like fixed and variable costs, taxes, rate base and rate of return.

Issue No 4 Appropriate Price Regulation

(What general method of price regulation will the Commission employ for Orissa licensees, in both short and long term)

The choice of methodology to regulate electricity pricing by the Commission has to be in conformity with the Reform Act 1995, the relevant section [Section 26(5)] of which says that tariffs "shall be just and reasonable and be such as to promote economic efficiency in the supply and consumption of electricity"

Section 26(2)(a) of the OER Act sets sections 57 and 57A of the Electricity(Supply) Act, 1948 and its Sixth Schedule as the baseline for Orissa Tariff regulation. The Act also allows the Commission to depart from that baseline on valid reasons in determining allowed revenues(Section 26(3)). Clearly if the stated objective of the Act is to be better achieved by departure from this baseline regime, then the Commission has a duty to make such changes and explain the reasons for the same in writing

The best solution to the problem of electricity pricing may lie with the market forces. However, the electricity industry is being characterised as a natural monopoly. There is, therefore, a need for a regulatory framework to achieve natural efficiency in the industry. Such efficiency may result in competitive pricing identical to what would have been achieved by market forces. The Commission's goal then is to achieve such low cost competitive prices through the regulatory framework

The traditional framework for setting electricity prices is governed by the Rate-of-Return (RoR) regulation. The Sixth Schedule of Electricity (Supply) Act, 1948 is one such methodology. It is sometimes referred to as cost-plus pricing because the regulatory entity is able to collect all its cost plus a regulated return on its investment from the customers. In general this method sets the total allowed revenues of the utility according to the following formula

$$RR = [RB \times RoR] + E_D + E_{O\&M} + T$$

Where :

- a) RR = the total annual revenue requirement of the utility
- b) RB = the rate base (required investment) of the utility
- c) RoR = the allowed rate of return (debt and equity) on investment.
- d)  $E_D$  = annual depreciation expense
- e)  $E_{O\&M}$  = annual operation & maintenance (O&M) expense
- f) T = annual taxes paid by the utility

Under this general framework the utility has the responsibility of proving to the regulatory body's satisfaction that each proposed element of the revenue required is prudent. For instance, investments made in capital plant must be shown to be useful in the provision of

electric service in order to be included in the RB term of the formula. Similarly, individual operating expense items must be shown to be necessary in order to be included in the L<sub>0&M</sub> term.

The revenue requirements of the regulated company are fixed and based upon the values of the terms in the formula during a Test Year (see discussion on cost basis in Issue 5), usually adjusted for known and measurable changes so as to reflect conditions expected to prevail during the time the proposed tariff will be in effect. Each term of revenue requirement formula is usually subjected to intense regulatory scrutiny and many are extensively contested by parties to the regulatory proceeding.

There are several advantages of RoR regulation. First, the system limits prices based upon a test year and they are unchangeable until the next tariff proceeding. After prices are set, the regulated entity's rate-of-return varies depending upon many seemingly uncontrollable aspects of cost and its ability to control those costs which can be controlled. Second, and as a result of the first, there is some incentive for the utility to minimize cost between tariff proceedings. Third, the close administration of prices by the regulator enables it to specify the exact form prices must take. Fourth, non-economic goals such as price relief for some sections of consumers are easier to meet using this system. Last, the hearings on tariff changes provide consumers a forum to present their views regarding the performance of the regulated utility.

This system also has several disadvantages. First, its cost-plus nature reduces the incentive for the utility to minimize cost in the long run. Second, if the allowed rate-of-return is greater than the actual cost of capital, there will be an incentive for the utility to build plant which may not be essential.

An alternative methodology is Performance Based Regulation (PBR) which is a development over rate-of-return/rate base regulation. Performance Based Regulation seeks to eliminate some of the regulator command and control aspects of RoR regulation and substitutes it by a system of incentives (or penalties) for performance by the regulated entity outside a "normal" range. A PBR system can be quite simple and focuses on a single area of utility operation such as generating plant reliability or system losses. It can be more complex and wide-ranging in its applicability by taking into account such things as customer satisfaction, outages at the consumer level, customer load growth, general inflation, prices to consumers, among others. Whether simple or complex, the purpose of the system is to relinquish some of the regulator's review power over one or more elements in the revenue requirement equation set out above. Instead, monetary incentives for good results or penalties for bad ones are substituted which the regulated entity can earn or pay respectively thereby affecting its profitability.

There are certain characteristics that are present in a good PBR System of regulation. First, the focus of the system should be on controllable aspects of the utility's operations. There is no point in creating a goal the utility can never achieve. Second, the system should be put into effect relatively for a longer period of time to recognize the short-and-long term trade offs made by the utility. For example, it is possible for a utility to

pay a bit more in terms of capital cost for a transformer with lower associated losses. Over time the capital cost would be more than offset by reduced losses. Third, the many interrelationships between areas of utility operations should be well recognized. Fourth, the possible rewards and penalties under the program should arguably be symmetric. For instance, the maximum potential reward for improvement in system reliability should be the same as the maximum potential penalty for failure to improve reliability. Fifth, those rewards and penalties should be limited in size so as not to unnecessarily enrich the utility or threaten its financial viability. Sixth, the targets set for the utility should be a range of reasonable performance levels based on external and normative standards so that the utility's own performance is not included in deriving the standard. Last, the focus of a good PBR programme is results, not the methods used to achieve those results.

A good PBR system of regulation has both advantages and disadvantages. The advantages are much the same as those listed for the RoR method with two important additions. First, a definite incentive for cost minimization can be built into the system. Second, a working PBR system may reduce the need for repeated tariff filings by the licensee(s). The first disadvantage of a PBR system is that unless the system is carefully designed, there may be an incentive for the regulated entity to lower service quality while pursuing monetary incentives in other areas. Second, there is less regulatory scrutiny in a well-designed PBR system because incentives or penalties take the place of such oversight. Third, there is less public input to the tariff process under this system because hearings are not held as frequently as under a RoR system.

For proper design of a good PBR system, comprehensive and reliable data are an essential requirement. These data should be amenable to independent verification.

The Commission has considered the advantages and disadvantages of the two basic forms of regulation and is inclined to continue to utilize the methodology in the Sixth Schedule of the Electricity (Supply) Act, 1948 which is a form of RoR regulation until such time as data become available to institute a comprehensive form of PBR in conjunction with the Sixth Schedule. The Commission believes that a PBR scheme can be accommodated within the Sixth Schedule. For example, if a licensee exceeded a performance goal for reliability in any given year, it could be allowed to collect an additional amount of return (as set in the PBR parameters) in the following year subject to the limits imposed by the Sixth Schedule. Likewise, under performance would lead to a reduction in the amount of allowed return in the following year.

Gridco, which is the sole licensee in Orissa, agrees that a PBR system of regulation is more transparent. Since price regulation may at best yield a second-best solution, there is scope for inefficiency particularly when there is no penalty for poor performance. While the Commission will make all efforts to ensure prudence on the expenditure side, standards of performance should be carefully designed so as not to allow unnecessarily excess return to the licensee or to avoid penalty truly not required.

Issue No 5 Tariff Filing Requirements

(What will be the filing requirements for tariff filings made with Commission by Gridco and other licensees)

The tariff filing requirements were conveyed to the licensee before the proceedings for tariff fixation for the 1997 98 financial year. The requirements have been supplemented and updated for the current tariff proceeding which is underway. This has been handed over to the licensee Gridco who have filed information to a reasonably satisfactory degree.

The Sixth Schedule has been incorporated in Section 57 and 57 A of the Supply Act. The said Sixth Schedule has been made the basis of tariff calculation in the OER Act, 1995 also. It has been prescribed in the Sixth Schedule that when the licensee intends to enhance the charges for supply of electricity, it has to send the proposal accompanied with such financial and technical data as may be prescribed by general or special order. Therefore, keeping in view the requirements of the Sixth Schedule, the Commission has drawn up elaborate proforma and information requirement which have been conveyed to the licensee for filing along with the tariff proposal. The requirement includes information on assessment of consumption, billing determinants, transmission and distribution loss, financial information, investment details, power purchase details, marginal cost of transmission, least cost combination of power purchase, calculation of clear profit, calculation of capital base subsidy, inter state comparison of tariff and salient performance data.

Stipulation is that Gridco has to fulfill the data requirements while submitting the tariff proposal. In case Gridco is not in a position to fulfill the above data requirements, it would need to advise the Commission about the non-availability of data. The Commission after examining the information and the explanation given along with it may scale down the data requirements. In any case the statements of essential data on the prescribed issues is a mandatory for processing the tariff proposal.

(If the overall revenue requirements are to be set using accounting costs, then what measure of plant value should be included in the rate base component used in the determination)

There are four possible measures of plant value for the calculation of the rate base viz original cost less depreciation, reproduction or replacement cost less depreciation, the value assigned by the Government when it was transferred to Gridco and the certified values being produced by Gridco for privatization under the Companies Act. The Commission first encountered this issue in the last Gridco tariff proceeding when it had faced with a decision on whether to value Gridco's investment in plant at the original cost at the time the property was put in service or at the value assigned to the investment by the Government when it was transferred to Gridco. As new values are being developed for the four distribution entities, this issue will surely come up again as potential purchasers of the Gridco system consider the level of their offers.

While arguments can be made for the use of other measures of plant value for rate base, the Commission has no choice but to accept the plant values certified by Government for Gridco at the time of transfer of assets plus any prudent capital additions made by the licensees at original cost less depreciation. The value set by Government under the scheme to transfer assets from the erstwhile OSEB to Gridco formed the basis of the calculations in the last consideration and the Commission will continue to use the transfer value until it is demonstrated before it that regulatory principles or public interest requires a change to be made. Such changes will not be made lightly as the Commission places substantial weight on the principle of predictable and stable tariffs and tariff methods.

However, the Commission will need to be assured that the total sum of the valuations of the four zonal distribution companies and the remaining transmission entities will be no greater than the current valuation of assets of Gridco. The Commission will make enquiries as to the nature of the certified values being developed for the four distribution entities and put interested parties on notice of this requirement.

While Gridco agrees with the Commission that the total value of the zonal assets should not exceed the total value of the distribution assets as set out in the Transfer Scheme as adjusted for subsequent additions and depreciation, it may be worthwhile to use the revalued fair price of the assets to avail of short- and long-term loan from financial institutions. The latter will enhance creditworthiness of the licensee while tariff will be based on depreciated book value as set out in the Transfer scheme adjusted for subsequent addition & depreciation.

Issue No 7 Unbundling of Tariff

(Should Gridco's tariff be unbundled so as to identify separately the bulk supply, transmission, retail supply and distribution portions of any charges)

Bundled tariffs are those in which more than one functions are combined under the same charge for service and usually occur because the same entity provides more than one function and simply clubs all of its costs into one. To the degree that pricing for the individual functions can be separated within a monopoly structure, consumers receive clear signals regarding the costs of the different components of the service. The eventual introduction of competition and/or privatization places new significance on unbundled tariffs. Tariffs separated into their functional components inform both consumers and potential investors of the cost and revenue stream attributable to each functional entity.

Presently while the marginal cost model separates Gridco's costs into functional categories, the individual components are combined into a single retail tariff. However, as disaggregation of transmission and distribution and privatization of distribution approach nearer, the process of unbundling will become increasingly valuable to investors as it will enable them to calculate the revenue stream for a specific functional entity and thereby assess the value of the underlying asset.

Though unbundling of tariff will promote transparency and may seem to be essential at the time of the privatization of four distribution companies, there appears to be no pressing need to go for it immediately. The Commission proposes to switch over to tariff unbundling providing a bulk supply tariff combining in it for bulk supply & transmission applicable for the distribution licensees. Further the transmission tariff is also to be shown separately to be made applicable to wheeling services. The concept of unbundling may then be viewed geographically and functionally. While geographical unbundling may reveal facts about the variations in the inter-zonal tariff structure, functional unbundling even at different voltage levels will help locate the areas of profit and loss of the licensees. As far as the retail users of electricity are concerned they may continue to be billed at a composite tariff as at present.

Issue No 8 Assignment of Revenue Requirement in Tariff Design

(How will licensee's revenue requirements be assigned to service classes/tariff schedules)

After the total revenue requirements of the regulated entity are determined it is necessary to distribute the total load to the various classes of service and to tariff schedules within those classes. This distribution may be cost-based or otherwise. If distribution is cost-based, two different cost methodologies may be used to determine a tariff assignment.

An assignment without any reference to costs may be referred to as social rate making. In this methodology social policy determines the level of revenues from each class and there is, therefore, no relationship between the costs a customer imposes on the system for the use of electricity and the price he pays. The inefficiencies inherent in this method are substantial and are in conflict with the Act and the Commission's assigned goals.

One cost-based methodology is to assign revenue responsibility using the results of a cost study based on the historic embedded costs of the utility. In such an exercise a historic year's revenue requirements are allocated to classes of service or tariff schedules based on certain factors. These factors may be based on the contributions of the classes to the total demand on the peak day of the utility, the kilowatt-hours purchased by the class as a percent of total sales, the number of customers in the class as well as many other factors and combinations thereof.

The most economically efficient assignment of the utility's revenue requirement is the use of marginal costs methodology. This is attempted by determining what the revenue realization would be if marginal costs were charged as prices to each class and then comparing the total to the revenue requirement of the utility. The Commission will require the licensees to work out and submit marginal cost analysis that could be used for development of tariff. Until such time, however, the Commission will expect the tariff design to be based on the accounting costs of the licensees as gradually modified by the need to phase out existing subsidies and cross-subsidies.

**Issue No 9 Requirement of Fuel and Power Purchase Adjustment**

**(Should Gridco be allowed to institute a fuel and purchased power adjustment clause to account for differences between projected and actual fuel and purchased power costs)**

The creation of a Fuel and Purchased Power Adjustment Clause (FPPAC) requires that an estimated base amount of fuel and purchase power cost be included in the calculation of the utility's tariffs. Any actual costs above or below that base amount shall be collected from or refunded to customers respectively by means of a per kilowatt-hour surcharge. The basic purpose of this type of clause is to insulate the utility from the risk of possible changes in a type of cost over which the licensee has little control.

In Orissa the cost of purchased power from various sources is largely defined by the Power Purchase Agreements in existence. However, both the estimated amount of power and the mix of sources that may be used to meet consumers' needs and to derive the licensee's tariffs can differ appreciably from the actual amount and the corresponding source mix in an operating year. Given the practical importance of both the estimates in the tariff process, there can be substantial risk to the licensee that it will not be repaid its full cost of purchased power. The Company may, therefore, be inclined to overestimate both the cost of power and the amount of power required. The institution of a FPPAC could eliminate such possibility without being unfair either to consumers or to the licensee.

The disadvantage of instituting such a clause is that Gridco may have little incentive to keep its cost of power low. The Commission will have to institute a process of thorough review of all aspects of licensee's purchase costs before allowing its collection through this clause. This review would deal only with actual numbers instead of estimates. The fuel price adjustment should be effective immediately after the change in price of fuel and/or oil in the interest of both the consumer & the licensee.

The Commission believes that the institution of FPPAC would be beneficial and could be instituted for licensees within the framework of the Act. Nothing in the Act prohibits such a clause and Section 26(6) specifically allows changes of this nature. The Orissa Electricity Regulatory Commission (Conduct of Business) Regulations, 1996 makes specific provisions in this regard in Regulation 115. However, the licensee bears the responsibility for initiating a proposal for the institution of such a clause. The Commission shall examine the licensee's proposals, as and when received, through appropriate process.

Issue No 10 Differential Tariff on Zonal Basis

(If cost differences exist between distribution companies in Orissa, should there be uniform retail tariffs throughout the state)

Historically uniform tariffs have prevailed in Orissa and also in all other states in spite of significant geographic cost differences. Moreover, the public has grown accustomed to uniform tariff for long.

Efficiency may suffer if prices don't reflect cost differences. For instance, consumers in the high cost (and low price) areas(s) may consume more power than they would if charged its full cost and those in the low cost (and high price) areas(s) may consume less than they would if priced at their cost. At times the disparity between price and cost may be so high that one group of consumers may be paying more than its marginal cost while another may be paying less. This is what is known as cross subsidy in economic literature.

Differential tariffs that vary in relation to cost differences generally make better use of society's resources than uniform tariffs. While geographically cost-based tariffs are more efficient, the shift away from uniform retail rates across the region violates a maxim of good tariff design that existing consumers should not be surprised by sudden and significant discontinuities in their tariffs. The principle of tariff continuity, however, should not be allowed to preserve inefficient tariffs indefinitely particularly when differing tariffs may be an inevitable result of the eventual formation of separate distribution companies, each filing its own tariff structure based on its own cost. Tariffs of different electricity supply companies have been different from those of the SEBs in states where such supply companies exist. Different distribution companies may have different tariffs depending upon their respective costs, standard of service etc. In fact differential tariff based on cost differences for different zones is a natural outcome.

Issue No 11 Seasonal And Time-of-Use Tariff

(If cost variations warrant them and metering is cost-effective, should seasonal and time-of-use tariffs be instituted for wholesale and retail sales)

The 1995 marginal cost analysis of Gridco indicated that seasonal cost differences were large enough to warrant seasonally-differentiated prices of electricity at both the bulk and the retail levels. In addition, sufficient differences did exist in the cost of power across the hours of the day to warrant the institution of time-differentiated prices for bulk service. The idea of instituting time-of-use(TOU) tariffs for retail service depends upon the cost-effectiveness of the special meters, not currently in place, that would be needed to make such pricing possible.

Prices for electricity that reflect differences in cost as much as possible are usually more efficient and that rule applies equally to cost differences related to time as well as to geography. The Commission believes that effective cost-based electricity pricing would involve TOU tariffs and that they should be instituted immediately for large customers where adequate metering exists for this purpose. Other large customers should be put on TOU Tariffs as soon as adequate meters are made available. The Commission will therefore expect Gridco to report whether it will be able to develop TOU tariffs for its large consumers at the earliest. While the existing level of metering efficiency and capacity at the EHT and HT levels may be improved upon in the short term in order to facilitate TOU tariffs, the latter may not be cost-effective in LT category of consumers. The licensee may be required to reduce purchase of costly power during peak hours by shifting loads to off-peak hours and thereby flattening the load curve.

# Appendix 15

## Rules of Procedures

**STATE ELECTRIC REGULATORY COMMISSION  
WEST BENGAL, INDIA**

**RULES OF PROCEDURE**

INTERNATIONAL RESOURCES GROUP Ltd  
Washington DC USA  
Draft

December 1998

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## SECTION 1 GENERAL RULES

### 1.1 INTRODUCTION

#### 1.1.1 PURPOSE, DEFINITIONS AND GENERAL PROVISIONS

The purpose of these rules is to govern the procedures of the State Electric Regulatory Commission in accordance with the laws established by the Central Electricity Regulatory Commission in Chapter 5 of the Electricity Regulatory Commissions Bill, 1998 (Bill XX of 1998).

These Rules may be called the State Electric Regulatory Commission Rules, 1999.

They extend to the whole of the State of West Bengal.

The Commission shall decide any question relating to the interpretation of these Rules.

#### 1.1.2 DEFINITIONS

Unless the context otherwise requires, all other words and phrases used in these Rules shall have the meaning attributed to them in the Bill.

- (a) "Bill" means The Electricity Regulatory Commission Bill of 1998.
- (b) "Complaint" means a written complaint filed with the Commission by any person against a licensee in contravention of any provision of the Bill or any order, rule, license or instruction made or issued pursuant to Section XX of the Bill.
- (c) "Chairperson" means the Chairperson of the State Electric Regulatory Commission.
- (d) "Member" means a Member of the State Electric Regulatory Commission.
- (e) "Secretary" means that person designated by the Commission to register and record the receipt of information, communications, data, filings and such other material as is received by the Commission and may assume such other duties as are delegated by the Commission.

### 1.2 COMMUNICATIONS

1.2.1 All communications, including all written and electronic correspondence, motions and pleadings, shall be deemed to be filed or received on the date on which the Commission receives

them at its principal office

1.2.2 Communications should describe only one matter and should contain the name and address of the communicator. When the subject matter pertains to a pending case, the title of the proceeding and the case number should be given.

1.2.3 Extensions of Time. When the last date for performing any act falls on a day on which the office of the Commission is closed and by reason thereof the act cannot be done on that day, it may be done on the next day on which the office is open.

1.2.4 Every application, notice, pleading, petition, complaint, motion, summary or memorandum filed with the Commission shall be signed by the filing party or by one or more attorneys in their individual names on behalf of the filing party.

1.2.5 The proceedings of the Commission shall be conducted in English.

1.2.7 The Commission shall have a Seal of its own which shall remain within the safe custody of the Chairperson. The Seal of the Commission shall be affixed by an officer designated for the purpose on all orders or communications made, notices issued or certified copies granted by the Commission.

1.2.8 The Secretary or in his/her absence such other officer as may be nominated by the Commission may exercise such functions as are assigned to him/her by these Rules or otherwise by the Commission. The Commission shall always have the power to revoke, revise, modify, amend, alter or otherwise change an order made or action by the Secretary or the officers of the Commission in circumstances considered appropriate by the Commission.

### 1.3 FILING PROCEDURES

1.3.1 Affidavit in support

- (a) Any filing, petition or request made before the Commission shall be verified by an affidavit, if so directed by the Commission.
- (b) Every affidavit shall be drawn up in the first person stating the full name, age, occupation and address of the deponent and the capacity in which he is signing and shall be signed and sworn before a person lawfully authorized to take and receive affidavits.
- (c) Every affidavit shall clearly and separately indicate that the statements are true to the knowledge of the deponent, information received by the deponent, and belief of the deponent.
- (d) Where any statement in an affidavit is stated to be true according to the information

received by the deponent the affidavit shall also disclose the source of such information together with a statement that the deponent believes that information to be true

### 1 3 2 Presentation of Filings

- (i) All petitions shall be filed in such number of copies as the Commission or Tribunal may specify. Each set of the petition shall be complete in all respects.
- (b) All petitions shall be lodged for registration at the headquarters of the Commission during business hours.

### 1 3 3 Action by the Commission

- (a) Upon receiving a petition the Secretary shall acknowledge the receipt by stamping and endorsing the date on which the petition has been received and issue an acknowledgment with stamp and date to the person filing the petition. In case the petition is received by registered post the date on which the petition is actually received at the office of the Commission shall be taken as the date on which the petition is filed.
- (b) The Secretary shall duly enter receipt of the petition in a register maintained for the purpose.
- (c) The Secretary may decline to accept any petition which does not conform to the provisions of the Bill or the Rules or directions given by the Commission. However no petition shall be refused for defect in the pleadings or format without giving to the person filing the petition an opportunity to rectify the defect within the time specified for the purpose. The Secretary shall advise the person filing the petition in writing of any defect in the petition. The Commission shall be entitled to call for the petition and give such directions regarding the presentation and acceptance of the petition as it considers appropriate.
- (d) Once the petition is accepted by the Commission withdraws any order of refusal the petition shall be duly registered at the date of its acceptance and given a registration number in the specified manner or in such manner as may be determined by the Commission.
- (e) As soon as the petition and all supporting documents are lodged and duly scrutinized and numbered it shall be placed before the Commission for admission.
- (f) Once the Commission admits the petition it may give such orders and directions for the service of notices to the respondent and other affected or interested parties for the filing of replies and rejoinder in opposition or in support of the petition in such form as the Commission may direct.

## 1 4 APPEARANCES

1 4 1 Any customer or interested person who desires to participate in a proceeding shall file written petition for leave to intervene or to participate in the proceeding

1 4 2 The petition shall state the name and address of the petitioner. It shall describe the manner in which the petitioner is substantially and specifically affected by the proceeding. It shall state the contention of the petitioner, the relief sought, and the statutory or other commission therefor, and the nature of the evidence the petitioner will present if the petition is granted.

1 4 3 Unless otherwise provided in the notice of hearing, the petition must be filed at least seven days prior to the date for hearing.

## 1 5 SERVICE OF NOTICES

1 5 1 Any notice or process issued by the Commission may be served by any one or more of the following as directed by the Commission:

- (a) service by the party itself
- (b) by hand delivery through a messenger
- (c) by registered post with acknowledgment due, and
- (d) by publication in two (2) national daily newspapers in the English language.

1 5 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.

1 5 3 The Commission shall be entitled to decide in each case the requirements for service of notices, summons, publications and other appropriate processes. The Commission shall also be entitled to decide who shall bear the cost of such service and publication.

1 5 4 Where any petition is required to be advertised, it shall be advertised within such time as the Commission may allow.

1 5 5 Unless otherwise specified by the Commission, the petitioner shall arrange service of all notices and other processes and for advertisement and publication of notices and processes required to be served. The Commission shall be entitled to decide in each case the party who shall bear the cost of such service and publication.

1 5 6 In default of compliance with the requirements of the Rules or directions of the Commission as regards service, the Commission may either dismiss the petition or give such further and other directions as it deems fit and proper.

## 1.6 FILING OF REPLY

1.6.1 Each respondent against whom the notice of inquiry or the petition is issued who intends to oppose or support the petition shall file a reply within five days and with such number of copies as may be required by the Commission. In the reply the respondent shall specifically admit, deny or explain the facts stated in the notice of inquiry or the petition and may also state such additional facts as he considers to be relevant and necessary for reaching a just decision in the case. The reply shall be signed, verified and supported by means of an affidavit in the same manner as in the case of the petition.

1.6.2 The respondent shall serve a copy of the reply along with supporting documents duly attested as true copies on the petitioner or his authorized representative and file proof of such service with the office of the Commission at the time of filing the reply.

1.6.3 Every person who intends to file comments in regard to a matter pending before the Commission pursuant to the advertisement and publication issued for the purpose (other than the persons to whom notices have been issued) shall deliver to the Secretary the statement of comments within ten days.

1.6.4 The Commission may permit such appropriate person to participate in the proceedings before the Commission if on a report received from the Secretary the Commission considers that the participation of such person will facilitate the proceedings and the decision in the matter.

1.6.5 Unless permitted by the Commission the person filing comments shall not be entitled as of right to participate in the proceedings. However the Commission shall be entitled to take into account the comments filed after giving such opportunity to the parties in the proceedings as the Commission considers appropriate.

## 1.7 HEARINGS

1.7.1 Public hearings will be granted as the Commission may determine in specific cases. The Commission may determine the stages, manner, the place, the date and time for hearing the matter as the Commission considers appropriate.

1.7.2 The Commission shall maintain a public listing of all proceedings set for hearing.

1.7.3 All hearings shall be held at the principle office of the Commission, unless the Commission designates a different location with at least seven days advance notice of the hearing.

1.7.4 Notice

- (1) The Commission shall give written notice of a listed hearing in any pending matter to all parties to others who have made written request for notice of hearing in a particular matter and to such other persons as deemed necessary or appropriate by the Commission
- (b) Such notice shall include but need not be limited to the time date place and nature of the hearing
- (c) Notice of a hearing shall be given at least 14 days prior thereto unless the Commission finds for reasons recorded in writing that a shorter period of notice is consistent with the public interest
- (d) The Commission may require any person filing an initial pleading to give notice of the hearing on such pleading by publication in two (2) national daily newspapers in the English language

#### 1.7.5 Conduct of Hearings

- (a) The hearing shall be conducted by a presiding officer who shall be the Chairman of the Commission or a member designated by the Chairman. The presiding officer shall administer oaths and affirmations issue subpoenas and make all decisions regarding the admission or exclusion of evidence or any other procedural matters which may arise in the course of the hearing
- (b) Where on a fixed date for hearing any of the party does not appear when the matter is called for the Commission may either dismiss the petition for default of appearance or proceed against the party in default and hear and decide the petition
- (c) Where a petition has been dismissed in default or decided without the party present the person aggrieved may file an application within 30 days from the date of such dismissal or order. The petitioner may seek recall of the order passed. The Commission may recall the order on such terms as it considers fit if the Commission is satisfied that there were sufficient cause for non-appearance when the petition was called for hearing

#### 1.7.6 Discovery

- (a) The purpose for discovery is to facilitate the hearing process by permitting the parties and the Commission to gain access to all relevant information in an efficient and timely manner. Discovery is intended to reduce hearing time narrow the scope of issues protect the rights of the parties and ensure that a complete and accurate record is compiled
- (b) The presiding officer shall establish discovery procedures in each case which take into account the legitimate rights of the parties in the context of the case at issue in

accordance with the Bill. In establishing discovery procedures, the presiding officer must exercise his discretion to balance the interests of the parties and ensure that the information necessary to complete the record is produced without unproductive delays.

- (c) At any time in the conduct of the case, the Commission may require any person whom the Commission considers appropriate to produce such documentary or other evidence as the Commission may consider necessary for the purpose of enabling it to conduct a fair hearing.
- (d) Discovery requests may be made at any time after the commencement of an investigation, and parties are encouraged to comply voluntarily with any such requests for information before the formal hearing process begins. Where appropriate, the presiding officer shall establish a formal schedule, either at the procedural conference or at some time before the commencement of evidentiary hearings.
- (e) The Commission may direct the summoning of the witnesses, discovery and production of any documents or other material in evidence, requisition or any public record from any office. The Commission may direct the examination of such books, financial statements or other documents or information as is held in the custody or control of any person which the Commission considers to be relevant to the issues involved.
- (f) A party is under a continuing duty to amend reasonably in early response if it obtains information that the response was incorrect or incomplete when made, or that the response, though correct when made, is no longer true or complete.

177 Depositions may be taken if agreed to by all parties or by Order of the presiding officer in the event of a dispute following a motion by the requesting party.

#### 178 Rulings

- (a) The presiding officer shall make advisory rulings during the course of the hearings when requested to do so by a party.
- (b) Rulings the presiding officer shall remain in full force and effect unless and until set aside or modified by the Commission. Any ruling of the presiding officer may be appealed to the full Commission.
- (c) If a party wishes to appeal a ruling of the presiding officer, the party should immediately notify the presiding officer, on the record if possible. The appeal must be filed in writing and served on all other parties.
- (d) A party may move at any time after the submission of an initial filing for dismissal or summary judgment as to all issues or any issue in the case. The motion shall be filed in writing and served on all parties. A motion for summary judgment shall set

forth in detail such supporting facts as would be admissible in evidence. The presiding officer shall afford other parties a reasonable time to respond in writing and may in his discretion permit oral argument on the motion.

- (c) All parties, counsel, witnesses, and other persons present at a hearing shall conduct themselves in a manner consistent with common standards of decorum.
- (d) At any stage of the hearing the presiding officer may call for further evidence upon any issue and require such evidence to be presented by the party or parties concerned or by the staff counsel, either at that hearing or adjournments thereof. At the hearing the presiding officer may authorize any party to file specific documentary evidence as a part of the record within a specified time.

#### 1 7 9 Transcripts

- (a) At the request of any party made in writing at least one day before the hearing date or of its own accord, the Commission shall provide that all proceedings in a pending case be officially recorded by a reporter appointed for that purpose. The Commission shall require any party requesting a copy of the transcript to pay the reasonable cost of preparing said copy before the Commission makes said copy available to the party.
- (b) Corrections in the official transcript may be made only to conform to the evidence presented at the hearing. Transcript corrections agreed to by the Commission may be incorporated into the record.

### 1 8 TENTATIVE DECISIONS

1 8 1 In any proceeding the presiding officer may call all parties together for a conference prior to the taking of testimony or may recess the hearing for such conference. The presiding officer shall state on the record the results of such conference.

1 8 2 Such tentative or proposed decision shall contain a statement of reasons and a determination of each issue of fact or law necessary to such decision.

### 1 9 ADVISORY RULING

1 9 1 Any interested person may at any time request an advisory ruling with respect to the applicability to any person, property or factual situation of any rule enforced or administered by the Commission. The request shall be addressed to the Commission and sent to the Chairperson by mail or delivered in person during normal business hours. All requests shall be signed by the person petitioner, contain his address, and state clearly and concisely the substance or nature of the request. The request may be accompanied by any supporting data, views or arguments. If the Commission determines that an advisory ruling will not be rendered, the Commission shall

within ten days thereafter notify the petitioner that the request is denied. If an advisory ruling is rendered, a copy of the ruling shall be sent to the petitioner.

1 9 2 The Commission may notify any person that an advisory ruling has been requested and may receive and consider arguments, views, or data from persons other than the person requesting the ruling.

1 9 3 The Commission upon its own motion or upon motion by a party or other person joined in the proceeding may order proceedings involving a common question of law or fact to be consolidated for hearing on any or all of the matters in issue in such proceedings.

## 1 10 EVIDENCE

1 10 1 Any matter contained in any records, investigations, reports, and documents in the possession of the Commission of which a party or the Commission desires to avail itself as evidence in making a decision shall be offered and made a part of the record in the proceeding. Such records and other documents need not be produced or marked for identification but may be offered in evidence by specifying the report, document, or other file containing the matter so offered.

1 10 2 The presiding officer may allow prepared direct testimony of any witness to be offered as an exhibit and may omit oral presentation of the testimony. Copies of such proposed exhibit shall be served upon all persons who have filed an appearance and on staff counsel of record at least seven days in advance of the session of the hearing at which such exhibit is to be offered.

1 10 3 In any hearing held pursuant to an investigation of the proposed rates, the proponent of the rates shall introduce as an exhibit a copy of the proposed rates and of those currently enforced.

1 10 4 Two or more parties to any proceeding may file with the Commission and serve on all parties a written statement of specific facts or issues. The statement shall be supported by relevant and necessary evidence. Other parties shall file any response to the statement within five days after service or within such other time as may be ordered by the presiding officer. The Commission shall rule on the acceptability of the statement within five days.

## 1 11 SUMMARIES

1 11 1 The presiding officer may allow and fix a time for the presentation of oral argument imposing such limits of time on the argument as deemed appropriate in the proceeding. Such argument shall be transcribed and bound with the transcript of testimony.

1 11 2 Summaries may be filed by a party either before or during the course of a hearing or within such time thereafter as the presiding officer shall designate.

1 11 3 Summaries may contain

- (a) A concise statement of the case
- (b) An abstract of the evidence relied upon by the party filing with reference to the pages of record or exhibits where the evidence appears
- (c) Argument and authorities and
- (d) Proposed findings and conclusions and if desired a proposed form of order or rule

1 11 4 The Commission may allow the parties to file evidentiary documents of any kind or exhibits at a time subsequent to the completion of hearing such time to be determined by the Commission

## 1 12 RECALCULATION

1 12 1 Within five days of service of a final Commission Order a party may file a motion for recalculation based on an alleged inadvertent error in a calculation contained in a final Commission Order The motion shall set forth in detail the proposed adjustments and the basis for the changes The Commission may in its discretion convene a conference or hearing to discuss the motion The Commission must act upon a motion for recalculation within 15 days of receipt of such motion unless it notifies the parties in writing that a longer period of time will be required and specifies the additional length of time necessary to consider the motion

## 1 13 1 RECONSIDERATION

1 13 1 Within ten days of service of a final Commission Order a party may file a motion for reconsideration Parties to the proceeding shall be afforded a reasonable opportunity to respond to a motion for reconsideration The Commission must act upon a motion for reconsideration within 15 days of receipt of such motion unless it notifies the parties in writing that a longer period of time will be required and specifies the additional length of time necessary to consider the motion

## 1 14 DECISIONS

1 14 1 All orders determinations and decision of the Commission shall be taken in writing and shall identify the determination of the Chairperson and all Members pursuant to Section XX of the Bill

1 14 2 All tariff decisions of the Commission shall be issued within six months of the date of receipt by the Commission unless shorter time limitations on a specific aspect of a case have been stipulated in these Rules

1 14 3 The reasons given by the Commission in support of its orders including those by any dissenting member or members if any shall form a part of the order Copies of all orders shall

be available at Commission premises for public inspection

1 14 4 All orders and decisions issued or communicated by the Commission shall be certified by signature of the Secretary or such person as is designated on his/her behalf by the Chairperson

1 14 5 All final orders of the Commission shall be communicated to the parties in the proceedings under signature of the Chairperson or such person as is designated on its behalf by the Chairman or the Secretary

1 14 6 The Commission shall clearly indicate that refunds may be ordered for the protection of customers while tariff decisions are pending before the Commission

## **1 15 APPEAL FROM COMMISSION DECISIONS**

1 13 1 The Commission shall notify all parties of their right to appeal a final decision of the Commission and of the time limits on their rights to appeal Any person aggrieved by any decision or order of the State Commission may file an appeal to the High Court of West Bengal concerned within sixty (60) days from the date of the communication of the decision or order of the State Commission to him on any question of law arising out of such order

## **1 16 INSPECTION BY THE PUBLIC**

1 16 1 The Commission shall maintain a policy for inspection and examination of public files and records The Commission shall post a fee schedule for obtaining copies of any Commission documents available to the public The Commission shall post the times of public access to files and records

1 16 2 Records

- (a) All records of every proceeding shall be open for inspection unless certain parts are specified by the Commission as confidential or privileged
- (b) Public access to records of the Commission shall be subject to compliance with such terms as the Commission may direct from time to time including the time place and manner and the payment of prescribed fees for inspection
- (c) The Commission may develop record keeping systems numbering systems and case management systems as are appropriate

## **1 17 CONFIDENTIALITY**

1 17 1 The Commission may issue such standards for confidentiality as it deems appropriate The Commission may change amend or revoke standards of confidentiality at any time

consistent with the provisions of these Rules

17.2 Any person compelled to produce documents in an investigation may claim that some or all of the information contained in a particular document is exempt from the confidentiality standards of the Commission

- (i) The person making such claim shall file a statement specifying the justification for a claim of confidentiality. General claims of confidentiality are not sufficient. Information must be furnished for the Commission to make an informed decision on the request for confidential treatment.
- (ii) The Commission retains the right to make the determination with regard to any claim of confidentiality.
- (iii) Notice of the decision by the Commission to deny a claim, in whole or in part, and an opportunity to respond shall be given to a person claiming confidentiality no less than five days before its public disclosure.

## SECTION 2 ADOPTION OF RULES

### 2.1 PETITION FOR ADOPTION OF RULES

2.1.1 Any interested person or his duly authorized attorney may at any time petition the Commission to adopt, amend, or repeal any rule. The petition shall be addressed to the Commission and sent to the Secretary by mail or delivered in person during normal business hours. All petitions shall be signed by the petitioner or his attorney, contain his address or the address of his attorney, and set forth clearly and concisely the text of the proposed rule. The petition may be accompanied by any supporting data, views, or arguments.

### 2.2 SCHEDULE

2.2.1 Upon receipt of a petition for the adoption, amendment, or repeal of a rule or upon written recommendation by the Chairperson or a Member of the Commission that a rule be adopted, amended, or repealed, the Commission shall determine whether to schedule the petition or recommendation for further proceedings. The Commission may determine to deny the petition without referral or without a hearing.

### 2.3 PUBLIC HEARING IS REQUIRED

#### 2.3.1 Notice

(a) Notice of a public hearing shall be given at least 21 days prior to the date of the hearing, unless any applicable law specifies some other time. The Commission shall publish the notice in at least two national daily newspapers in the English language having circulation in the area specified by the Commission.

(b) The notice shall contain the following:

- (i) The statutory Commission to adopt the proposed rule
- (ii) The time and place of the public hearing
- (iii) The express terms or the substance of the proposed rule

2.3.2 On the date and at the time and place designated in the notice, the Commission shall hold a public hearing. The meeting shall be opened, presided over, and adjourned by the Chairman or other member of the Commission. Within ten days after the close of the public hearing, written statements and arguments may be filed with the Commission. The Commission shall consider all relevant matter presented to it before adopting, amending, or repealing any rule.

2.3.3 Any interested person or his duly authorized representative, or both, shall be given an opportunity to present oral statements and arguments. In its discretion, the Commission may limit the length of oral presentation.

## **2.4 AVAILABILITY OF RULE**

2.4.1 The Chairperson of the Commission shall be responsible for keeping a book containing all the Rules of the Commission

2.4.2 In addition the Chairperson shall compile and publish the rules which are currently in effect. All the rules of the Commission shall be available for inspection during normal business hours at the Commission's offices. Copies of all rules shall be available to any person on request. The Commission may charge a reasonable fee for each copy.

## **2.5 REQUEST FOR NOTICE OF HEARINGS**

2.5.1 Any person or group may file a request in writing to receive notice of hearings or rules which may affect such person or group.

2.5.1 The request shall contain the following: Name of person or group, address, subject matter of rules which may affect the person or group.

2.5.3 The request shall be filed with the Secretary of the Commission during the month of December and shall be in effect only during the subsequent calendar year.

## **2.6 FURTHER POWERS OF THE COMMISSION**

2.6.1 The Commission may make such further rules for the conduct of business before the Commission as it deems necessary in accordance with the rules contained within this document and in accordance with the Bill.

# Appendix 16

Tariffs, Schedules and  
Contracts

**STATE ELECTRIC REGULATORY COMMISSION  
WEST BENGAL, INDIA**

**TARIFFS, SCHEDULES AND CONTRACTS**

INTERNATIONAL RESOURCES GROUP Ltd  
Washington DC USA  
Draft

December 1998

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## SECTION 1

### 1.1 SCOPE OF APPLICATION

1.1.1 Every entity generating transmitting or distributing electricity in the State of West Bengal is required to have approved tariffs on file with the Commission

1.1.2 The Commission shall provide the standards for calculating the expected revenue from charges and for determining the tariffs from time to time. The Commission may at any time add amend alter revise substitute or otherwise change the standards in accordance with the directions issued by the State Government

1.1.3 If such tariffs are not on file or have not been approved in accordance with these Rules then the Commission will order such filings as it deems necessary

1.1.4 Every entity generating transmitting or distributing electricity for retail sale in the State of West Bengal may be required to obtain a license for such generation and sale in accordance with rules as may be promulgated by the Commission

1.1.5 Unless otherwise provided by the Commission a licensee shall charge only such tariff from consumers as is approved by the Commission

### 1.2 FORMAT OF TARIFFS, SCHEDULES AND CONTRACTS

1.2.1 All tariffs schedules and contracts shall be typewritten printed or otherwise legibly duplicated

1.2.2 Two copies of all tariffs or schedules and two copies of all contracts shall be filed with the Commission

1.2.3 Contents

(a) Each tariff or schedule shall show prominently the name of the licensee making a petition for approval by the Commission

(b) Tariffs and schedules shall show plainly all requisite detail to explain the basis of all

charges to be made and all rules governing the same. Schedules shall show not only the price or unit upon which based but also any and all meter rentals, service charges, basis for determining demand discounts, and other detail necessary for a complete understanding of the charges contemplated.

- (c) The petition shall state in a concise manner the grounds and facts forming the basis of the petition and the relief or determination sought.

#### 124 Numbering and Effective Date

- (a) Each tariff or schedule shall be designated by an individual number progressing from that last filed by the same party or in case of a new series from No. 1. Each shall show plainly the date issued and date to become effective.
- (b) When forwarding sufficient time must be allowed to cover transmission in order that tariffs and schedules may become effective on the date specified which is the first day of the month next after the expiration of 14 days from the date of filing with the Commission.

### 13 LETTERS OF ADVICE

131 Letter To avoid misunderstanding tariffs or schedules should be accompanied by a letter of Transmittal addressed to the Chairman of the Commission showing the name of issuing party, individual number, and effective date. The Letter of Advice should be sent in duplicate and one copy shall be stamped and returned to the sender showing the date of filing. The Letter should be sent 30 days in advance of the intended request for a change in tariffs or schedules.

132 A letter of explanation at the time of filing shall accompany all tariffs and schedules. Such letter shall set forth in whatever detail is necessary the total amount of the change in charges proposed by the new schedule and the effect by comparison with customers charges under the existing rate schedule. The letter of explanation shall indicate the effect on the billings of the customers served under the various rate classifications affected. This letter of explanation shall be in addition to the letter of transmittal referred to above.

### 14 POSTING OF RATES

141 All rates, charges and prices set forth in tariffs or schedules filed by a licensee engaged in the transmission, distribution and sale of electricity in accordance with the above rules shall be printed and copies thereof shall be made available at the licensee's offices and at the office of the Commission.

## 15 DATES

151 All matters filed under these Rules shall be deemed filed on the date of receipt by the Commission

## 16 NOTICE OF GENERAL RATE CHANGES TO CUSTOMERS OF LICENSEE

161 Whenever there is an application for a general change in rates pursuant to these Rules the Commission may require the licensee to give notice of the application by publication in two (2) national daily newspapers in the English language having circulation in the area specified by the Commission

162 The newspaper notice shall contain the following information

- (a) Total rupee amount of rate change,
- (b) Total percentage change in annual revenues
- (c) Typical bill impact of the proposed change on each class of customers
- (d) A statement indicating that the Commission has suspended the effective date for the proposed change until the specified date in order to conduct an investigation and that the Commission has provided for refund protection to the customers if such protection is warranted
- (e) Place date and time of public hearing,
- (f) Company telephone number that can be called for further information

163 This notice shall be published a minimum of two times with the first publication occurring at least 21 days before the date of the first public hearing. The second publication is to occur approximately seven days before the date of the first public hearing

164 Concurrent with the filing of the rate request with the Commission the licensee shall include a copy of the proposed notice as part of its filing

165 In addition to notice by publication, the licensee shall include an insert notice with its regular bill for charges transmitted to each customer during the next regular billing cycle immediately following the filing of the request for a rate change

## 2.0 GENERAL PRINCIPLES

2.1.1 The Commission must consider the financial integrity of the utility and the customer right to a reliable service at reasonable rates as the primary goals of regulation. Its action must balance these two goals.

2.1.2 The Commission recognizes that the utility incurs costs in providing customer service and is entitled to the opportunity to recover these costs.

2.1.3 The burden to prove that costs are reasonably and prudently incurred lies with the utility. The Commission has a right to challenge these costs and disallow unreasonable or imprudent investments and costs.

2.1.4 The ratemaking process should produce rates such that when applied to billing kWh sales will result in revenues that are sufficient to cover cost including a reasonable return (profit) on the invested funds by the enterprise. This is the fundamental traditional ratemaking approach and rate structures and procedures should be consistent with this principle.

2.1.5 The Commission may consider practical issues such as ease of billing, customer understanding, available technologies in rate cases.

## 3.0 COST SERVICE

3.1.1 Operations and maintenance expenses including fuel and purchased power

3.1.2 Depreciation and Amortization

3.1.3 Taxes other than income taxes

3.1.4 Income taxes

3.1.5 Return on investment (profit) requirement

Sum of these components produces total cost of service which is then compared to the annual revenues produced and billing kw/kwh sales. Rates are then adjusted to equalize revenues to the total costs for the annual period called the Test Year.

## 4.0 RATE DESIGN

4.1.1 The Commission may develop such methodologies for rate design and cost allocation as are deemed appropriate

4.1.2 The Commission may require that Licensees prepare detailed load forecasts cost allocation methodology cost of service studies by customer class forecast of bill impacts by customer class and such other information as is necessary

4.1.3 The Commission may apply such standards of review as are appropriate and consistent with principles of rate making approved by the Commission in order to produce just and reasonable tariff schedules

## 5.0 STANDARDS AND GUIDELINES

5.1.1 The Commission may issue guidelines regarding the substance or contents of filings to provide assistance to licensees seeking changes in tariffs. The Commission may set standards regarding the substance or contents of filings to provide assistance to licensees seeking changes in tariffs. The Commission may amend, change, alter or revoke guidelines or standards at any time. The Commission may hold public hearings in accordance with these Rules in the development of guidelines and standards

5.1.2 Any licensee seeking a change in tariffs schedules shall submit to the Commission full documentation supporting the requested change together with such information and data as is deemed necessary and relevant to the case according to the guidelines or standards issued by the Commission

5.1.3 The Commission shall evaluate tariff submissions and establish standards and guidelines as are deemed appropriate. The tariff design objectives that will guide the Commission follow. The Commission will make its best efforts to strike a balance between the stated objectives in order to optimize benefits to all parties involved while taking into account technical and social limitations

- (a) protect consumers against monopolistic and oligopolistic prices
  - (i) licensees will only be allowed recovery of those costs prudently incurred to meet the demonstrated needs of their customers
  - (ii) licensees will be allowed profits under a fair return standard which promotes continued investment in equipment and facilities
  - (iii) the profits allowed licensees will take into account operational efficiency and

- quality of service
- (b) keep in view the research development and capital investment programme costs of licensees
- (i) licensees will only be allowed recovery of those costs prudently incurred to meet the demonstrated needs of their customers
  - (ii) licensees will be allowed profits under a fair return standard which promotes continued investment in equipment and facilities
  - (iii) the profits allowed licensees will take into account operational efficiency and quality of service
- (c) encourage efficiency in licensees' operations and quality of service,
- (i) licensees will only be allowed recovery of those costs prudently incurred to meet the demonstrated needs of their customers
  - (ii) licensees will be allowed profits under a fair return standard which promotes continued investment in equipment and facilities
  - (iii) the profits allowed licensees will take into account operational efficiency and quality of service
- (d) encourage economic efficiency in the electric power industry
- (i) tariffs will reflect the full cost of service to consumers
  - (ii) tariffs will reflect marginal cost principles where possible
- (e) keep in view the economic and social policy objectives of the Federal Government
- (i) the Commission will take into consideration the economic and social policy objectives of the Federal Government
- (f) determine tariffs so as to eliminate exploitation and minimize economic distortions
- (i) tariffs will reflect the full cost of service to consumer groups with similar service requirements
  - (ii) tariffs will be fair and not unduly discriminatory,
  - (iii) tariffs will provide stability and predictability for customers over time, and
  - (iv) tariffs will be understandable and free of misinterpretation