#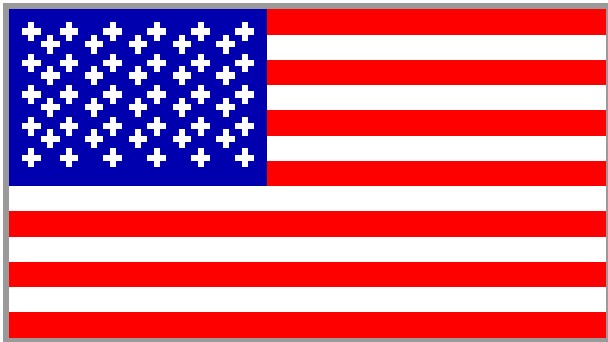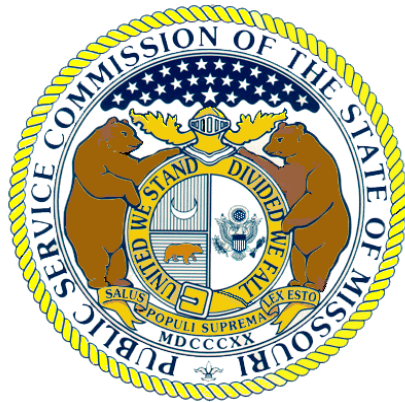 Rwanda Utilities Regulatory Agency (RURA), National Association of Regulatory Utility Commissioners (NARUC) and Missouri Public Service Commission (MPSC)

Regulatory Partnership Program

Sponsored by US Agency for International Development (USAID)

RURA and NARUC Partnership

Wednesday, October 27th, 9:00 to 10:30

Warren Wood

Rate Structures/Methodologies

Rate Structures/Methodologies

Rate Base Determination

General Definition of Rate Base - A utility's rate base is the total value of its various properties: power plants, transmission lines, buildings, fuel, stocks (if an IOU), etc. The utility is allowed, through its rates, to collect a percentage of profit or margin on the value of its rate base. This percentage of profit or margin (called rate of return) varies, but generally averages 5 to 11 percent.

Rate Structures/Methodologies

Rate Base expressed in mathematical terms:

Original Cost of Electric Plant in Service

– Accumulated Depreciation Reserves

– Accumulated Provision for Deferred Income Taxes (Accounts 281-283)

– Operating Reserves

+ Electric Plant Held for Future use

+ Construction Work in Progress (if allowed)

+ Working Capital

+ Accumulated Provision for Deferred Income Taxes (Account 190)

= Rate Base

Rate Structures/Methodologies

Rate of Return - The percentage of profit a utility may earn from its electric rates; generally, it applies only to investor-owned utilities regulated by a state agency.

Rate Structures/Methodologies

Mathematical Expression of Rate of Return:

R = RB x r

Where:

R   =   Return

RB   =   Rate Base

r   =   Rate of Return

             (a percentage)

Rate Structures/Methodologies

Revenue Requirement Determination

Revenue Requirements expressed in mathematical terms:[1]

$$RR = [(^{Tr}/_{1-Tr}) + 1] * (OE + R + FITA + SITA - OR)$$

The elements that are applied in the above formula are the test year costs, plus pro forma adjustments if a historical test year is used.

[1] Page 26, Electric Utility Cost Allocation Manual, January 1992, distributed by National Association of Regulatory Utility Commissioners

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Where:

RR =   Total retail service revenue requirement

Tr =   Revenue tax rate, if applicable

OE =   Operating expenses, excluding income
             and revenue taxes

R   =   Return

FITA =   Federal income taxes allowable

SITA =   State income taxes allowable

OR   =   Other operating revenue, exclusive of
                 revenue taxes

Rate Structures/Methodologies

Normalized items in a rate case:

→ Weather normalization - An adjustment made to a utility's sales and revenues by assuming that the weather was normal during the period such sales and revenues occurred. ("Normal" is usually calculated by taking the average of the previous 30 years of weather data.)

Rate Structures/Methodologies

→ Tax Normalization - An accounting method under which the full tax effect that results from taking advantage of certain provisions of the tax law is not flowed through to income in the year that the tax effect is experienced, but rather is amortized over the life of the property giving rise to it.

Rate Structures/Methodologies

→ Volatile Cost of Service items – occasionally, when cost of service expenses are volatile, those expenses are normalized to calculate an amount that better represents the costs and expenses incurred.

Rate Structures/Methodologies

Class Costs of Service Analysis

Cost of service studies are among the basic tools of ratemaking and are used by regulators for the following purposes:

→ To attribute costs to different categories of customers based on how those customers cause costs to be incurred.

Rate Structures/Methodologies

➔ To determine how costs will be recovered from customers within each customer class.

➔ To calculate costs of individual types of service based on the costs each service requires the utility to expend.

Rate Structures/Methodologies

→ To determine the revenue requirement for the monopoly services offered by a utility operating in both monopolistic and competitive markets.

→ To separate costs between different regulatory jurisdictions.

Rate Structures/Methodologies

Generally, the main purpose of cost of service studies is to aid in the design of rates. The development of rates for a utility may be divided into four basic steps.

→ Development of test period revenue requirements.

Rate Structures/Methodologies

→ Calculation of the test period revenue requirement to be recovered through rates.

→ The cost allocation procedure

→ The design of rates

Rate Structures/Methodologies

The cost of service study for an electric utility generally includes the following efforts:

→ Functionalization – Involves categorizing accounts by the type of function with which an account is associated. Accounts are categorized as being related to Production, Transmission, Distribution, Customer Accounts, Administrative and General, etc.

Rate Structures/Methodologies

→ Classification – Involves designating different classes as: customers (related to the number of customers), demand (related to the portion of peak usage), commodity (related to annual energy consumption), or "other" costs, depending on the function that they are associated with.

→ Allocation of Costs – Involves choosing allocation factors that will allocate a reasonable share of jurisdictional costs to each customer class.

Rate Structures/Methodologies

Data Collection Needs – A significant amount of data needs to be tracked and supplied by the utility.

Data for embedded costs relies on the company's historical records or projections of these records, whose accuracy can be audited and verified at the time of the filing or at the end of the projected period.

Rate Structures/Methodologies

Types of Customer Classes

General Definition of Customer Classifications - Customers are categorized and charged by type of rate classification. These may include: residential, commercial, industrial, public street and highway lighting, public authorities, railroads and railways.

Rate Structures/Methodologies

Why Customer Groups are Classified In This Manner

Customer groups are classified in this manner to collect revenues from utility customers within a class depending on customer usage levels and patterns. A Class Cost of Service Study allows a utility to properly allocate the costs of providing the electric service to its customers.

Rate Structures/Methodologies

Why the Rates Vary Between Customer Classes

Rates vary between customer classes based on how the utility is used by each customer. Certain customers use more energy than others, which result in higher customer and commodity charges.

Rate Structures/Methodologies

Once the customer classes to be used in

the cost allocation study have been designated,

the functionalized and classified costs are

allocated among the classes as:

→ Demand-related costs – Allocated among
the customer classes on the basis of demands
(KW) imposed on the system during specific
peak hours.

Rate Structures/Methodologies

→ Energy-related costs – Allocated among the customer classes on the basis of energy (KWH) which the system must supply to serve the customers.

Rate Structures/Methodologies

→ Customer-related costs – Allocated among the customer classes on the basis of the number of customers or the weighted number of customers. Normally, weighting the number of customers in the various classes is based on an analysis of the relative levels of customer-related costs (service lines, meters, meter reading, billing, etc.) per customer.

Questions?