



RATE BASE: RECORDING AND TRACKING PLANT ASSETS

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POWERING ARIZONA'S FUTURE

Outline

- To learn about the components that make up Rate Base
- To learn how Rate Base is calculated
- To understand why the Commission prefers to set rates based on a rate base using a rate of return



Terms and Definitions

- Rate Base – The total of the investor-funded plant, facilities, and other investments used by the utility in providing service.
- Gross plant in service – Includes all plant used to serve customers regardless of the funding source.
- Accumulated depreciation – The total depreciation booked over the useful life of the plant items used in the provision of service.
- Contribution in aid of Construction (CIAC) – Any amount or item of money, services or property received by a utility, from any person or governmental agency, any portion of which is provided at no cost to the utility.



What are some Rate Base considerations?

- Gives certainty to owners.
- Gives incentives to owners.
- Shared benefits between owners and rate payers.
- Gives price signals for consumption and investment.
- Gives signals of the regulator's expectations regarding the maintenance of assets.



Additional Rate Base considerations

- Prudent investments necessary or useful to the provision of Service.
- Exclude plant that is not used and useful.
- Exclude plant or investments that are contributed or donated, or funded by sources other than debt or equity.
- Exclude plant that has already been partially or fully depreciated.
- Exclude plant that is related to unregulated services.



Primary Rate Base Components

- Gross Plant in service
 - Original Cost
 - Replacement Cost
 - Fair Value
- Accumulated Depreciation
- Plant Advances
- Accumulated Deferred Income Taxes
- Contributions
- Amortization of CIAC
- Customer Deposits and Advances
- Inventory – Materials and Supplies
- Prepayments
- Working Capital



Gross Plant in Service

Original Cost

- Based on the actual cost at the time that the asset was first placed into service.
- Age and inflation result in under-valuation.
- Often too low to accurately reflect infrastructure costs during a Rate Case.

Replacement Cost

- An estimate of the cost to replace the existing system in today's market.
- May be repriced based on current configuration or a new configuration that incorporates new technology and efficiencies.

- Often too high to accurately reflect infrastructure costs during a



Original Cost Formula - UPIS

$$\begin{aligned} & \text{Original Cost Gross Plant in service} \\ & + \text{ Prudent Capital Additions} \\ & - \text{ Asset Disposals or Retirement} \\ & - \text{ Accumulated Depreciation} \\ & = \text{ Net Plant in Service (for rate purposes)} \end{aligned}$$



Replacement Cost Formula - UPIS

$$\begin{aligned} & \text{Original Cost Gross Plant in service} \\ & + \text{ Prudent Capital Additions} \\ & - \text{ Asset Disposals or Retirement} \\ & + \text{ Index Allowance} \\ & - \text{ Accumulated Depreciation} \\ & = \text{ Net Plant in Service (for rate purposes)} \end{aligned}$$

Note using the replacement cost isn't common with small companies, especially those using the Short Form Rate Application, the use of which waives the right to a Fair Value filing.



Fair Value Rate Base - UPIS

Fair value is the average of the Original Cost and the Replacement Cost

$$\text{FVRB} = (\text{OCRB} + \text{RCND})/2$$



Accumulated Depreciation

- Includes all of the depreciation expense that has been taken on an asset since it was placed into service.
- Included as a deduction to the regulatory asset base
 - Accumulated Depreciation represents the portion of the gross plant that has already been recovered.
- For regulated utilities, accumulated depreciation also includes retirements and salvage activity.



Plant Advances

- Coded to Account 252 – Advances for Construction
- Represent any amount of money received from or on behalf of the water company’s customers.
 - Usually in the form of a deposit (not customer deposits for service)
 - Refundable
 - Also known as Advances in Aid of Construction (“AIAC”).
- Subtracted from rate base
 - Investors are not permitted to earn a return on money they did not provide.
- Not amortized and used to offset depreciation expense like CIAC is.



Accumulated Deferred Income Tax

- Taxes that must be paid at a later date because tax payments were delayed by the Company using accelerated depreciation methods on their taxes.
- Accelerated depreciation methods authorized in the tax basis of accounting, but not in accrual basis of accounting create a timing differences.



Accumulated Deferred Income Taxes Example

- \$50,000 Asset
- Useful Life = 5 years (no salvage value)
- MACRS Depreciation (Tax Basis)
- Straight Line Depreciation Method (Accrual Basis)
- Half-Year Convention for both methods



Accumulated Deferred Income Tax Example

Tax Depreciation

Year 1: \$10,000

Year 2: \$16,000

Year 3: \$9,600

Year 4: \$5,760

Year 5: \$5,760

Year 6: \$2,880

Accrual Depreciation

Year 1: \$5,000

Year 2: \$10,000

Year 3: \$10,000

Year 4: \$10,000

Year 5: \$10,000

Year 6: \$5,000



Accumulated Deferred Income Tax Example

Tax Basis Tax Expense
(25%)

Year 1: \$2,500

Year 2: \$4,000

Year 3: \$2,400

Year 4: \$1,440

Year 5: \$1,440

Year 6: \$720

Accrual Basis Tax Expense
(25%)

Year 1: \$1,250

Year 2: \$2,500

Year 3: \$2,500

Year 4: \$2,500

Year 5: \$2,500

Year 6: \$1,250



Deferred Income Tax by the numbers

	Tax Basis Depreciation Amount	Accrual Basis Depreciation Amount	Difference	Deferred Tax Expense (25%)	Deferred Tax Balance
Year 1	\$10,000	\$5,000	\$5,000	\$1,250	\$1,250
Year 2	16,000	10,000	\$6,000	\$1,500	\$2,750
Year 3	9,600	10,000	-\$400	-\$100	\$2,650
Year 4	5,760	10,000	-\$4,240	-\$1,060	\$1,590
Year 5	5,760	10,000	-\$4,240	-\$1,060	\$530
Year 6	2,880	5,000	-\$2,120	-\$530	\$0



Contributions in Aid of Construction (“CIAC”)

- Infrastructure provided to the Company at no cost.
- Company not authorized to receive a return on investments not paid for by owner.
- Example:
 - Builder gives infrastructure over to water company to service new residential buildings.
 - Customer pays for infrastructure up front through surcharge without requirement to return for rate case.



Amortization of CIAC

- CIAC is amortized at the Plant Composite Rate, unless detailed records exist to document the account information of the contributions. In these cases the approved depreciation rate for that account will be used.
- Offsets CIAC balance similar to accumulated depreciation for plant.
- CIAC net of CIAC amortization is subtracted from Rate Base.



Regulatory Liabilities

- Expenses today that are carried forward to a different accounting period, usually for rate making purposes.
- Must have Commission approval or specific authorization in the USoA.
- Subtracted from Rate Base.



Cash Working Capital Formula

- Power – $1/24$ of the annual purchased power costs. General concept is that if a utility bills customers for power they used in the past (as opposed to billing for future services), that utility was required to fund cash up-front to cover costs between the time service was provided and when payment was received.
- Operations and Maintenance – $1/8$ of the annual operating expenses not including power and taxes.
- Both are added to Rate Base.



Inventory – Materials and Supplies

- Items such as PVC pipe, fittings, meter boxes, etc.
- Utility earns a return on these items because they are assets necessary for safe and reliable service and are part of the overall utility investment.
- Based on test year ending balance.



Prepayments

- Allowed to earn a return if not recognized elsewhere.
- Utility earns a return on these items because they are assets necessary for safe and reliable service and are part of the overall utility investment.
- Based on average monthly balances.



Rate Base Calculation

Gross Plant in service (net of contributed capital (CC))

- Accumulated Depreciation (net of CC)
- = Net Plant in Service (for rate purposes)
- Customer Deposits and Advances
- Deferred Income Taxes
- Net CIAC (CIAC-Amortization of CIAC)
- Regulatory Liabilities
- + 1/24 Purchased Power
- + 1/8 Operation & Maintenance
- + Inventory
- + Prepayments
- = RATE BASE



Sample Rate Base Calculation

$$\text{Rate Base} = \text{PIS} - \text{AD} - \text{CD} - \text{DIT} - \text{Net CIAC} + \frac{1}{24}(\text{PurPow}) + \frac{1}{8}(\text{Op\&Maint}) + \text{Inv} + \text{PP}$$

- Plant in Service = \$273,227
- Accumulated Depreciation = \$63,258
- Customer Deposits = \$0
- Deferred Income Taxes = \$0
- 1/24 purchased power = \$3,232
- 1/8 operations & maintenance = \$11,124
- Prepayments = \$2,041
- Inventory = \$0
- Rate Base = \$273,227 - \$63,258 - \$0 - \$0 + \$3,232 + \$11,124 + \$2,041 + \$0 = \$226,366



Rate Base and the Rate Case

- Probably won't have all rate base components as presented in this lecture. That's OK.
- Ombudsman team can help with your rate base



Materiality

As set forth in Decision No. 75743, the materiality for rate base for:

- Class C utilities is \$1,000 for data requests and \$5,000 for adjustments.
- Class D utilities is \$500 for data requests and \$3,000 for adjustments.
- Class E utilities is \$250 for data requests and \$1,000 for adjustments.



Rate of return

- The Commission's preferred method of establishing the revenue requirement is a rate of return.
- Uses a formula that provides recovery of cash used for operating expenses and provides a return on the owners investment made in the system giving consideration to the capital structure of the utility.



How do you calculate the Revenue Requirement?

$$RR = OM + D + T + r(RB)$$

- RR = revenue requirement
- OM = operating and maintenance expenses
- D = depreciation and amortization expense
- T = income tax expense
- $r(RB)$ = return on rate base or cost of capital
- RB = rate base = (OC - AD)
 - OC = original cost of assets when placed in service
 - AD = accumulated depreciation on assets since placed in service

OMA + D + T is sometimes referred to as “cost of service” while others refer to revenue requirement as “cost of service”.



What if my Rate Base is too low?

Three alternative methods to calculate rates if there is not enough or negative rate base:

- Cash Availability Analysis
- Operating Margin Analysis
- Debt Service Coverage ratio



Cash Availability

The revenues are based on providing the Company with enough cash to meet operating demands and build a reserve for contingencies like a pump.



Operating Margin

The revenues are based on providing the Company a reasonable margin. Usually between 10 and 20%, but may be higher or lower depending on the specific circumstances of the utility.



Debt Service Coverage (DSC) ratio

The DSC represents the number of times internally generated cash (i.e., earnings before interest, income tax, depreciation and amortization expenses) covers required principal and interest payment on the debt. A DSC greater than 1.0 means operating cash flow is sufficient to cover debt obligation.

Most lenders require a DSC of 1.20 or higher. The rates will be set to ensure compliance with this requirement.





THANK YOU

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