Variable Operations and Maintenance (VOM) Costs Education

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Operating Agreement Schedule 2 – Components of Cost

Market Sellers can include the following incremental costs in a generator's cost-based energy offer:

- Incremental Fuel Cost
- Incremental Maintenance Cost
- No-Load cost during periods of operation
- Incremental labor cost
- Emission allowances/adders
- Variable operations and maintenance adders
- Ten percent adder
- Other incremental operating cost

Operating Agreement Schedule 2 – Maintenance Adders

Maintenance Adders cannot include any costs that are included in a generation resource's Avoidable Cost Rate

Section 2.6

- "*Variable Maintenance Cost is the parts and labor expenses of maintaining equipment and facilities in satisfactory operating condition."*
- *"Only expenses incurred as a result of electric production qualify for inclusion."*
- *The Maintenance Adder should be reviewed (and updated if changed) at least annually.*

Sections 5.6.2 & 6.6.2

- *CC/CT Plant major inspection and overhaul expenses after being previously evaluated and approved, may be included until June 1, 2015 in variable maintenance expenses.*

Maintenance Costs

NOT RUN

ACR

Avoidable Cost Rates

FIXED
Avoidable costs

- Plant Staff
- Taxes
- Fees
- Insurance
- Carrying Charges
- Fuel Availability

RUN

VOM-M15

Variable Operations and Maintenance – Manual 15

SIX TO TEN YEARS
Major overhauls and inspections

- CT Hot Gas Path Inspections
- Turbine Overhaul
- Boiler Overhaul
- CT and CC Excluded June 15, 2015

ANNUAL
Annual repairs from operating

- Pump/Valve Repair
- Boiler Tube Leak Repair
- CT Air Filter Replacement

OPERATING DAY
Short run marginal cost

- Short Run Marginal Cost
- Water
- Chemicals
- Consumables

- Maintenance Adders are calculated by:
  - determining annual maintenance cost for each year of the selected maintenance period
  - using escalation indexes for normalizing annual maintenance cost for previous years
  - calculating Equivalent Hourly Maintenance Cost

M15: Total Maintenance Cost

$$\text{Total Maintenance Cost}_{\text{next year}} =$$

$$\left(\text{Annual Maintenance Cost} * \frac{\text{Escalation Index}^{\text{next year}}}{\text{Escalation Index}^{\text{current year}}}\right) +$$

$$\left(\text{Annual Maintenance Cost} * \frac{\text{Escalation Index}^{\text{next year}}}{\text{Escalation Index}^{\text{last year}}}\right) +$$

$$\left(\text{Annual Maintenance Cost} * \frac{\text{Escalation Index}^{\text{next year}}}{\text{Escalation Index}^{\text{last year}-1}}\right) +$$

$$\ldots + \left(\text{Annual Maintenance Cost} * \frac{\text{Escalation Factor}^{\text{next year}}}{\text{Escalation Index}^{\text{last year}-(\text{maintenance period}-1)}}\right)$$

- Escalation index derived from July 1 Handy – Whitman Index Table E-1, Line 6, “construction cost electrical plant”

- A unit must choose a rolling historical period based on calendar year.
- A unit may choose a 10-year or 20-year period for maintenance cost.
- A unit can only change this period after a significant unit configuration change.

Manual 15: Equivalent Hourly Maintenance Cost

Equivalent Hourly Maintenance Cost is the total maintenance dollars divided by equivalent service hours or total fuel, depending on the unit type.

$$\text{Equivalent Hourly Maintenance Cost (\$/Hour)} = \frac{\text{Total Maintenance Dollars}}{\text{Equivalent Service Hours}}$$

Or

$$\text{Equivalent Hourly Maintenance Cost (\$/mmbtu)} = \frac{\text{Total Maintenance Dollars}}{\text{Total Fuel}}$$

Immature Units – Units with neither 10 years of operation nor 50,000 Operating Hours

- Immature Units should use a blend of actual, calculated, or forecasted costs. The weighted blend should be based on the ratio of historical operating hours to projected hours to meet 50,000 hours or achieving ten years of operation whichever comes first.

- FERC Accounts are referenced for maintenance adders for nuclear, fossil, combined cycle, and combustion turbine/diesel units.
- FERC Accounts may no longer be applicable due to rule changes for RPM/ACR.
  - Market Sellers using FERC Accounts must verify that costs were not also included in the unit's ACR.

VOM Reference Documents

- Operating Agreement
  - Schedule 2
- Manuals
  - M15 Cost Development Guidelines
    - Section 2.6(all), 3.6(nuclear), 4.6(fossil), 5.6(CC), 6.6(CT/diesel), 7.6(hydro), & 9.6(wind)