



Proposed Modifications Cost Development Guidelines Regulation Cost Based Offers

MIC

April 25, 2007

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Proposed Changes to Definition of Cost of Regulation

- Heat rate loss due to operating the unit at lower output than at optimal economic dispatch.
- Heat rate loss due to non-steady state operation.
- VOM costs related to the provision of regulation.

- Heat Rate Adjustments
 - Heat rate loss due to operating the unit at lower outputs than at optimal economic dispatch.
 - Heat rate loss from operating the unit over a large range of outputs
 - Heat rate loss due to non-steady state operation.
 - Heat rate losses increase resulting from rapid and continuous changes in generator firing rates.

- Variable Operations and Maintenance (VOM) Costs
 - VOM costs increase from the provision of regulation service.
 - For units that have historically provided regulation service, VOM costs related to regulation are included in the approved Cost Development Guideline (CDG) FERC accounts, as part of the energy cost-based offers.
 - Units that have provided regulation service for less than 10 years do not have costs fully accumulated in CDG accounts that include 20 years of data.
 - Owners have three options.
 - Utilize default values for non-hydro generators that have provided regulation for less than 10 years. Hydro generators can utilize the default value regardless of historical regulation service.
 - Utilize default values for non-hydro generators that have provided regulation for 10 years or more, if those default VOM expenditures are subtracted from the 20 year historical accumulation of VOM costs for energy cost-based offers.
 - Direct submittal to and approval by the PJM MMU of actual incremental VOM costs.

- **Default VOM Costs**

- Super-critical Steam \$10.00 per MW of regulation.
- Sub-critical steam \$3.50 per MW of regulation.
- Combined cycle \$2.50 per MW of regulation.
- Combustion turbine \$2.00 per MW of regulation.
- Hydro \$1.00 per MW of regulation.

- **Estimated Cost**

- Example: 100 MW sub-critical coal fired unit with 7 years of regulation service history.

- Heat rate loss resulting from regulating over a range of output = \$3.50 per MW of regulation.
 - Heat rate loss resulting from non-steady state operation = \$0.47 per MW of regulation.
 - Default VOM adder = \$3.50 per MW of regulation.
 - Margin adder = \$7.50 per MW of regulation.
 - Total cost based offer = $(\$3.50 + \$0.47 + \$3.50 + \$7.50) = \$14.97$ per MW of regulation.

- Estimated Cost Offer Comparison
 - Includes default VOM in every case

		Current Method Average	Proposed Method Average	
Type	Fuel			Difference
CC	Gas	\$11.58	\$18.94	\$7.36
Steam	Coal	\$12.75	\$18.67	\$5.92
Steam	Oil	\$26.84	\$35.81	\$8.97
Steam	Gas	\$26.16	\$34.73	\$8.57
CT	Jet A	\$43.08	\$64.00	\$20.92
CT	Light Oil	\$40.95	\$60.61	\$19.66
CT	Gas	\$25.26	\$36.84	\$11.59
Hydro	Hydro	\$8.50	\$8.50	\$0.00

- **Estimated Cost Offer Comparison**
 - The table represents the average regulation cost offer for all units that offered regulation services in calendar year 2006.
 - Weighting each average regulation cost by the quantity of regulation MW provided in calendar year 2006 results in an average cost based offer increase of about \$5 per regulation MWh.
 - The average cost based offer differential for the marginal units for calendar year 2006 was about \$6.