

Reactive Power Capability

RTO Reactive Compensation Methodologies

Reactive Power Compensation Task Force
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Sustainability &
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Electric Market
Policy

Overview of Compensation Methods in other RTOs/ISOs

		Construct	Linked to testing
RTO	PJM	Rate Case (AEP)	No
	MISO	Rate Case (AEP)	No
	NYISO	Flat Rate	Yes
	ISO-NE	Flat Rate	Yes
	SPP	N/A	N/A
	CAISO	N/A	N/A

Compensation is based upon two approaches:

1. Rate Case – Revenue requirements are determined by a cost-based methodology (e.g., AEP) for resources on a unit specific or fleet basis using the resource’s MVAR capability.
2. Flat Rate- Resource is paid a flat rate per-MVAR region-wide based on testing for a maximum MVAR capability.

PJM Rate Case (AEP Methodology)

- Allows resources to seek recovery of reactive power capability costs through settlement or hearing at FERC.
 - Provides method for allocating the costs of generation equipment between real power capability and reactive power capability.
 - Reactive compensation is not linked to the tested capability of a resource. However, PJM does require units receiving reactive power compensation to test their resources over a 66-month period.
- ❑ Allows for resources to submit actual cost data of generation components related to production of reactive power, which include:
 1. Generator and exciter
 2. Step-up transformer
 3. Accessory electric equipment that supports operation of exciter
 4. Any remain total production investment
 - ❑ Provides a means for synchronous generators to receive compensation for reactive services and voltage control via lost opportunity and uplift payments.

MISO Rate Case (AEP Methodology)

- Similar to the PJM methodology it allows resources to seek recovery of reactive power capability costs through settlement or hearing at FERC.
 - Provides method for allocating the costs of generation equipment between real power capability and reactive power capability.
 - Reactive compensation is not linked to the tested capability of a resource. However, MISO does require that resources meet the testing requirements of its Regional Reliability Council within the past 5 years.
- ❑ Qualified resources submit actual cost data of generation components related to production of reactive power, which include:
 1. Generator and exciter
 2. Step-up transformer
 3. Accessory electric equipment that supports operation of exciter
 4. Any remaining total production investment

NYISO Flat Rate

- Compensates resources for reactive capability by multiplying a flat rate of \$/MVAR-year by a resource's tested reactive capability.
 - The flat rate for the capability of providing reactive power is established annually.
 - The annual rate is the product of the compensation rate and the sum of the lagging and absolute value of the MVAR capacity of the resource, as tested.
- ❑ Only the Flat Rate for fixed capital costs related to a resource's capability of providing reactive power is paid.
 - ❑ No compensation for variable costs associated with producing reactive power.
 - ❑ Flat Rate determined by dividing the total program compensation by the total leading and lagging capability of all qualified resources.
 - ❑ Flat rate is adjusted annually for inflation.

ISO-NE Flat Rate

- Compensates resources for reactive capability by multiplying a flat rate of \$/MVAR-year by a resource's tested reactive capability.
 - The flat rate for the capability of providing reactive power is established annually.
 - Only the Qualified VARs of a Qualified Reactive Resource receive compensation.
 - Qualified VARs must be determined through actual testing at least every 5 years.
 - Monthly payment will equal $1/12 \times (\text{VAR Capacity Cost Rate} * \text{Qualified VARs})$
- ❑ Qualified Reactive Resources receive compensation through the following:
 1. A Flat Rate for fixed capital costs related to providing reactive power.
 2. A variable rate for Lost Opportunity Costs (LOC) for generators dispatched down by the ISO to provide VAR Service.
 3. A variable rate for Cost of Energy Consumed (CEC) for resources producing or absorbing reactive power at zero real power at the request of the ISO.
 4. A variable rate for the Cost of Energy Produced (CEP) to provide compensation to cover the variable cost of bringing a resource online or increase its output above its "economic loading point".
 - ❑ Flat rate is adjusted annually for inflation.

Comparison of Rate Case vs Flat Rate

	Rate Case	Flat Rate
Construct Design	<ul style="list-style-type: none"> • FEREC 205 filing for approval of compensation based on AEP cost-based methodology using MVAR capability of resource. • Make Whole and LOC credits. 	<ul style="list-style-type: none"> • Flat rate for fixed costs for capability to provide reactive capability. • Can also be supplemented by variable rates.
Challenges	<ul style="list-style-type: none"> • Arduous and costly process to defend and contest rate case. • “Black Box” settlement not transparent • Applicability of “AEP Methodology” to non-synchronous resources. • Excessive per-MVAR cost recovery for certain resource types. 	<ul style="list-style-type: none"> • May not reflect actual costs for all resource types.
Benefits	<ul style="list-style-type: none"> • Generators can demonstrate costs of reactive capability to the FEREC. 	<ul style="list-style-type: none"> • Clear, simple and transparent. • Inputs can be updated annually (e.g., inflation) • Significantly reduces litigation costs. • Performance can be tied to compensation. • Can include capacity cost, LOC, Cost of Energy and Cost of Energy Produced.

References

- FERC Notice of Inquiry, Reactive Power Capability Compensation, November 18th, 2021.
- PJM Schedule 2 of the Open Access Transmission Tariff
- MISO Schedule 2 Reactive Supply and Voltage Control from Generation or Other Sources Service
- ISO-NE Transmission, Markets and Services Tariff, Schedule 2 – Reactive Supply and Voltage Control Service
- NYISO Market Administration and Control Area Services Tariff (MST), Section 15.2 Rate Schedule 2- Payments for Supplying Voltage Supply

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