UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators	))))))	Docket No. AD14-14-000

COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to the Order Directing Reports issued on November 20, 2015 ("November 20th Order"), and the PJM Interconnection, L.L.C. Report on Price Formation Issues submitted on February 17, 2016 ("February 17th Report"), Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM ("Market Monitor"), submits these comments.[1]

I. COMMENTS

A. Pricing Fast Start Resources

The Market Monitor supports part of PJM's response on the pricing of fast start resources and disagrees with part.

PJM's response appropriately reflects the tradeoff between setting LMP based on the marginal resources and creating an incentive for over generation. In addition, PJM's response appropriately reflects the negative impact of including start up and no load costs in the price setting logic in the same way that incremental costs are included.

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[1] The Market Monitor includes substantial material from the 2015 State of the Market Report for PJM v.2 (March 10, 2016) ("2015 SOM") in these comments.

The Market Monitor does not agree with PJM's approach to reducing the economic minimum of units in order to change LMP using what PJM refers to as price setting logic.

In November 2014, PJM implemented a software change to its day ahead and real time market solution tools that would enable PJM to reduce energy uplift by artificially selecting the marginal unit for any constraint. The goal is to make marginal any unit committed by PJM to provide reactive services, black start or transmission constraint relief if such unit would otherwise run with an incremental offer greater than the correctly calculated LMP. PJM calls this approach price setting logic.

The application of the price setting logic reduces energy uplift payments by artificially increasing the LMP. The price setting logic is a form of subjective pricing because it varies from fundamental LMP logic based on an administrative decision to reduce energy uplift.

PJM and Alstom presented examples of this approach at the FERC Technical Conference: Increasing Real-Time and Day-Ahead Market Efficiency Through Improved Software.[2] The presentation shows a two bus model connected by one transmission line, three generators (A, B and C) and load at one of the buses. In the solution based on the fundamental LMP logic that PJM has used since the inception of markets, two of the generators are committed (A at 50 MW and B at 50 MW) to serve load (100 MW). The LMP is set at $50 per MWh (the offer of generator A) at both buses. Generator B has to be made whole (paid energy uplift) because the LMP ($50 per MWh) does not cover the generator's offer ($100 per MWh). Generator B does not set the LMP because its economic minimum is higher than the relief needed to relieve the constraint. This solution is not acceptable for PJM because the most expensive generator would have to be made whole. In order to

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[2] *See* PJM/Alstom. "Approaches to Reduce Energy Uplift and PJM Experiences," presented at the FERC Technical Conference: Increasing Real-Time and Day-Ahead Market Efficiency Through Improved Software. Docket No. AD10-12-006, which can accessed at: <*http://www.ferc.gov/june-tech-conf/2015/presentations/m2-3.pdf*> (June 23, 2015).

reduce energy uplift, PJM shows two alternatives. Solution 2: Reduce the economic minimum of generator B to zero MW. Solution 3: Reduce the limit of the transmission line to a level that would make the LMP higher at the bus where the most expensive generator is connected.

In solution 2, generator B is dispatched at 10 MW, despite the fact that this is physically impossible. This allows generator A to increase its output to 80 MW, which makes the transmission constraint binding and causes price separation between the two buses. This is an artificial result, not consistent with actual dispatch, designed to achieve an administrative goal.

In solution 3, the line limit is reduced from 80 MW to 40 MW, despite the fact that this is not the actual limit. As a result, generator A is dispatched to 40 MW (10 MW less than the original solution), the transmission line constraint is binding and congestion occurs. The goal is met and energy uplift is reduced to zero because the LMPs at both buses are increased so that they equal or exceed the generators' offers. Again, this is an artificial result, not consistent with actual dispatch, designed to achieve an administrative goal.

PJM does not have clear rules in the tariff or the manuals that define when this price setting logic would be applied.

Attempting to reduce uplift at the expense of fundamental LMP logic is not consistent with the objective of clearing the market using a least cost approach. The result of PJM's price setting logic in this example is to increase total production costs.

PJM should not use price setting logic to artificially override the nodal prices that are based on fundamental LMP logic in order to reduce uplift.

B. Commitment to Manage Multiple Contingencies

The Market Monitor supports PJM's responses on the management of multiple contingencies with one important exception, PJM's use of closed loop interfaces.

PJM implemented closed loop interfaces with the stated purpose of improving the incorporation of reactive constraints into energy prices and to allow emergency DR to set

price.[3] PJM applies closed loop interfaces so that it can use units needed for reactive support to set the energy price when they would not otherwise set price under the LMP algorithm. PJM also applies closed loop interfaces so that it can use emergency DR resources to set the real-time LMP when DR resources would not otherwise set price under the fundamental LMP logic. Eleven of the 17 (65 percent) closed loop interface definitions were created for the purpose of allowing emergency DR to set price.

Closed loop interfaces are used to model the transfer capability into a specific area. Areas or regions are defined in PJM by hubs, aggregates or control zones, all comprised of buses. Closed loop interfaces are not defined by buses, but defined by the transmission facilities that connect the buses inside the loop with the rest of PJM. PJM reduces the interface real transfer capability to a level that will artificially make marginal the resource selected by PJM. Table 1 shows the closed loop interfaces that PJM has defined.

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[3] *See Id*.

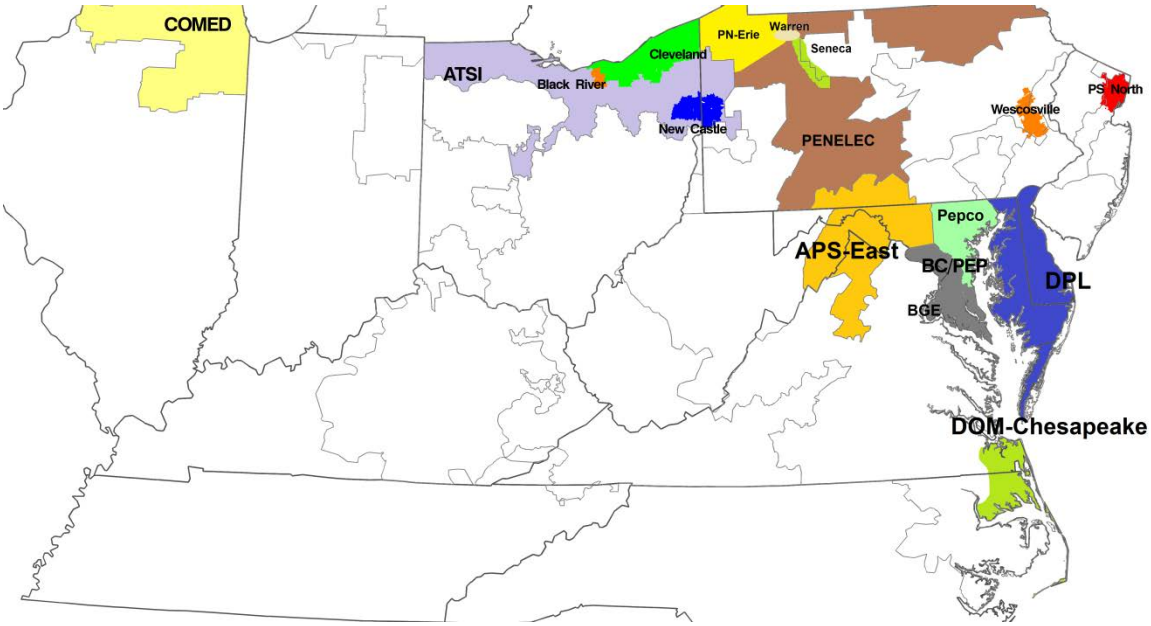
Table 1 PJM Closed loop interfaces [4]

Interface	Control Zone(s)	Objective	Effective Date	Limit Calculation
APS-East	AP	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	June 19, 2015	Limit equal to actual flow
ATSI	ATSI	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	July 17, 2013	Limit equal to actual flow
BC	BGE	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	June 19, 2015	Limit equal to actual flow
BC/PEP	BGE and Pepco	Reactive Interface (not an IROL). Used to model import capability into the BGE/PEPCO/Doubs/Northern Virginia	NA	PJM Transfer Limit Calculator
Black River	ATSI	Allow emergency DR resources set real-time LMP	September 1, 2014	Limit equal to actual flow
Cleveland	ATSI	Reactive Interface (IROL)	NA	PJM Transfer Limit Calculator
COMED	ComEd	Reactive Interface (IROL)	NA	PJM Transfer Limit Calculator
DOM-Chesapeake	Dominion	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	August 14, 2015	Limit equal to actual flow
DPL	DPL	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	June 19, 2015	Limit equal to actual flow
New Castle	ATSI	Allow emergency DR resources set real-time LMP	July 1, 2014	Limit equal to actual flow
PENELEC	PENELEC	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	April 22, 2015	Limit equal to actual flow
Pepco	Pepco	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	June 19, 2015	Limit equal to actual flow
PL-Wescosville	PPL	Allow emergency DR resources / unit(s) needed for reactive to set real-time LMP	July 24, 2014	Limit equal to actual flow
PN-Erie	PENELEC	Allow emergency DR resources set real-time LMP	April 22, 2015	Limit equal to actual flow
PS North	PSEG	Objective not identified. Interface was modeled in 2014/2015 Annual FTR auction	NA	NA
Seneca	PENELEC	Allow unit(s) needed for reactive to set day-ahead and real-time LMP	February 1, 2014	Limit equal to actual flow
Warren	PENELEC	Allow unit(s) needed for reactive to set day-ahead and real-time LMP	September 26, 2014	Limit equal to actual flow

Figure 1 shows the approximate geographic location of PJM's closed loop interfaces.

[4] *See* 2015 SOM (Section 4: Energy Uplift, Table 4-34).

Figure 1 PJM Closed loop interfaces map[5]



PJM uses closed loop interfaces to artificially use the strike price of emergency DR to set LMP. This use of closed loop interfaces permits subjective price setting by PJM. PJM has not explained why the economic fundamentals require that DR strike prices set LMP when the resource is not marginal. Although DR should be nodal, DR is not nodal and cannot routinely set price in an LMP model. DR should be nodal so that it can set price when appropriate. The current PJM rules permit emergency DR to set a strike price as high as $1,849. There are no incentives for DR to set strike prices at an economically rational level because emergency DR is guaranteed the payment of its strike price whenever called. Emergency DR should have an offer cap no higher than generation resources, that emergency DR be required to make offers in the Day-Ahead Energy Market like other capacity resources and the emergency DR be paid LMP rather than a guaranteed strike price when called on. PJM's use of closed loop interfaces is a result of significant deficiencies in the rules governing DR. PJM's use of closed loop interfaces is also the result

[5] *See* 2015 SOM (Section 4: Energy Uplift, Figure 4-7).

of significant issues with PJM's scarcity pricing model which is not adequately locational. PJM uses closed loop interfaces and emergency DR strike prices as a substitute for improved scarcity pricing.

In a DC power flow model, such as the one used by PJM for dispatch and pricing, units scheduled for reactive support are only marginal when they are needed to supply energy above their economic minimum. With the use of closed loop interface, these units are forced to be marginal in the model even when not needed for energy, by adjusting the limit of the closed loop interface. This artificially creates congestion in the area that can only be relieved by the units providing reactive support inside the loop. The goal is to reduce energy uplift from the noneconomic operation of units needed for reactive support by forcing these units to be marginal when they are not, raising energy prices and thereby reducing uplift.[6]

The Market Monitor has recommended and supports PJM's goal of having dispatcher decisions reflected in transparent market outcomes, preferably LMP, to the maximum extent possible and to minimize the level and rate of energy uplift charges. But part of that goal is to avoid distortion of the way in which the transmission network is modeled. The use of closed loop interfaces is a distortion of the model.

PJM should not use closed loop interface constraints to artificially override the nodal prices that are based on fundamental LMP logic in order to: accommodate rather than resolve the inadequacies of the demand side resource capacity product; address the inability of the power flow model to incorporate the need for reactive power; accommodate rather than resolve the flaws in PJM's approach to scarcity pricing; or for any other reason.

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[6] *See* "PJM Price-Setting Changes," presented to the EMUSTF, which can be accessed at <*http://www.pjm.com/~/media/committees-groups/task-forces/emustf/20131220/20131220-item-02c-price-setting-option.ashx*>.

Market prices should be a function of market fundamentals and energy market prices should be a function of energy market fundamentals. PJM has not explained why the other consequences of deviating from market fundamentals do not outweigh any benefits of artificially creating constraints in order to let reactive resources set price when they are not in fact marginal. PJM has not explained why the use of closed loop interfaces to permit emergency DR to set price is not simply a crude workaround to a viable solution, consistent with the LMP model, which would be to make DR nodal. The need for closed loop interfaces to let emergency DR set price is primarily a result of the fact that DR is zonal, or subzonal with one day's notice, and therefore cannot be dispatched nodally or set price nodally. The reduction of uplift is a reasonable goal in general, but the reduction of uplift is not a goal that justifies creating distortions in the price setting mechanism.

C. Uplift

Energy uplift is paid to market participants under specified conditions in order to ensure that resources are not required to operate for the PJM system at a loss. Referred to in PJM as day-ahead operating reserves, balancing operating reserves, energy lost opportunity cost credits, reactive services credits, synchronous condensing credits or black start services credits, these payments are intended to be one of the incentives to generation owners to offer their energy to the PJM energy market at marginal cost and to operate their units at the direction of PJM dispatchers. These credits are paid by PJM market participants as operating reserve charges, reactive services charges, synchronous condensing charges or black start charges.

From the perspective of those participants paying energy uplift charges, these costs are an unpredictable and unhedgeable component of participants' costs in PJM. While energy uplift charges are an appropriate part of the cost of energy, market efficiency would be improved by ensuring that the level and variability of these charges are as low as possible consistent with the reliable operation of the system and that the allocation of these charges reflects the reasons that the costs are incurred to the extent possible.

The goal should be to reflect the impact of physical constraints in market prices to the maximum extent possible and thus to reduce the necessity for out of market energy uplift payments. When units receive substantial revenues through energy uplift payments, these payments are not transparent to the market because of the current confidentiality rules. As a result, other market participants, including generation and transmission developers, do not have the opportunity to compete to displace them.

One part of addressing the level and allocation of uplift payments is to eliminate all day-ahead operating reserve credits. It is illogical and unnecessary to pay units day-ahead operating reserve credits because units do not incur any costs to run and any revenue shortfalls are addressed by balancing operating reserve credits.

The level of energy uplift paid to specific units depends on the level of the unit's energy offer, the unit's operating parameters, the details of the rules which define payments and the decisions of PJM operators. Energy uplift payments result in part from decisions by PJM operators, who follow reliability requirements and market rules, to start units or to keep units operating even when hourly LMP is less than the offer price including energy, no load and startup costs. Energy uplift payments also result from units' operational parameters that may require PJM to schedule or commit resources during noneconomic hours. The balance of these costs not covered by energy revenues are collected as energy uplift rather than reflected in price as a result of the rules governing the determination of LMP.

PJM's goal should be to minimize the total level of energy uplift paid and to ensure that the associated charges are paid by all those whose market actions result in the incurrence of such charges. For example, up to congestion transactions continue to pay no energy uplift charges, which means that all others who pay these charges are paying too much. In addition, the netting of transactions against internal bilateral transactions should be eliminated. The goal should be to minimize the total incurred energy uplift charges and to increase the transactions over which those charges are spread in order to reduce the impact of energy uplift charges on markets. The result would be to reduce the level of per

MWh charges, to reduce the uncertainty associated with uplift charges and to reduce the impact of energy uplift charges on decisions about how and when to participate in PJM markets.

But it is also important that the reduction of uplift payments not be a goal to be achieved at the expense of the fundamental logic of an LMP system. For example, the use of closed loop interfaces to reduce uplift should be eliminated because it is not consistent with LMP fundamentals and constitutes a form of subjective price setting. The same is true of what PJM terms its price setting logic.

D. Uplift Allocation Issues

PJM's allocation of operating reserve charges (the largest component of energy uplift in PJM) was a result of an agreement among stakeholders to balance simplicity, cost-causation and incentive principles. The final rules from this consensus became effective December 1, 2008. It has been evident that the operating reserve charges allocation that resulted was flawed and did not achieve the intended balance. PJM has not effectively addressed required reforms to this allocation. The only two important changes to the allocation since December 1, 2008, were changes to the allocation of operating reserve charges resulting from resources committed for black start services and from resources scheduled in the Day-Ahead Energy Market for reactive services. The Market Monitor has made a comprehensive set of recommendations designed to address these issues. The recommendations were introduced in the PJM stakeholder process.

E. Uplift Allocation Recommendations

The Market Monitor has made specific recommendations to address issues related to the allocation of operating reserve charges which have not yet been adopted by PJM:

- Require that up to congestion transactions pay energy uplift charges for both injections and withdrawals;
- Eliminate the use of internal bilateral transactions (IBTs) in the calculation of deviations used to allocate balancing operating reserve charges;

- Allocate the energy uplift payments to units scheduled as must run in the Day-Ahead Energy Market for reasons other than voltage/reactive or black start services, as a reliability charge to real-time load, real-time exports and real-time wheels;
- Reallocate the operating reserve credits paid to units supporting the Con Edison – PJM Transmission Service Agreements;
- Categorize and allocate the total cost of providing reactive support as reactive services. Reactive services credits should be calculated consistent with the operating reserve credits calculation;
- Include real-time exports and real-time wheels in the allocation of the cost of providing reactive support to the 500 kV system or above, which is currently allocated solely to real-time RTO load; and
- Enhance the current energy uplift allocation rules to reflect the elimination of day-ahead operating reserves, the timing of commitment decisions and the commitment reasons.

The Market Monitor has made specific recommendations to address issues related to the calculation of operating reserve credits which have not yet been adopted by PJM:

- Eliminate the day-ahead operating reserve category to ensure that units receive an energy uplift payment based on their real-time output and not their day-ahead scheduled output;
- Reincorporate the use of net regulation revenues as an offset in the calculation of balancing operating reserve credits;
- Do not compensate self-scheduled units for their startup cost when the units are scheduled by PJM to start before the self-scheduled hours;
- Four modifications to the energy lost opportunity cost calculations:

- Calculate LOC based on 24 hour daily periods or multi-hour segments of hours for combustion turbines and diesels scheduled in the Day-Ahead Energy Market but not committed in real time;
- Compensate units scheduled in the Day-Ahead Energy Market and not committed in real time for LOC based on their real-time desired and achievable output, not their scheduled day-ahead output;
- Compensate units scheduled in the Day-Ahead Energy Market and not committed in real time for LOC incurred within an hour; and
- Allow only flexible fast start units (startup plus notification times of 30 minutes or less) and short minimum run times (one hour or less) to be eligible by default for LOC compensation to units scheduled in the Day-Ahead Energy Market and not committed in real time (Other units should be eligible for LOC compensation only if PJM explicitly cancels their day-ahead commitment).

F. Market Monitor Allocation Proposal

The Market Monitor proposes to redesign the operating reserve charges allocation to better incorporate the commitment timing and commitment reasons, to include all transactions and resources that have an impact on the market results, such as up to congestion and wheeling transactions, and to exclude those transactions that do not, such as internal bilateral transactions. The net result of the Market Monitor's proposals is to reduce the level of uplift defined as deviations and to increase the level of uplift defined as reliability. The result of that recategorization on allocation is to substantially reduce the allocation of uplift to financial transaction and to increase the allocation to deviations resulting from physical participants and load.

The current method allocates day-ahead operating reserve charges to day-ahead load, day-ahead exports and decrement bids. The elimination of the day-ahead operating reserve category would shift these costs to the balancing operating reserve category which

would be paid by deviations or by real-time load plus real-time exports depending on the balancing operating reserve allocation rules.

A new category should be created for energy uplift payments to units scheduled in the Day-Ahead Energy Market (for reasons other than reactive or black start services), which would be allocated to all day-ahead transactions and resources. All these transaction types have an impact on the outcome of the day-ahead scheduling process, so allocating these costs to all day-ahead transactions ensures that all transactions that affect the way the Day-Ahead Energy Market clears are responsible for any energy uplift credits paid to the units scheduled in the Day-Ahead Energy Market. Energy uplift payments to units scheduled as must run in the Day-Ahead Energy Market (for reasons related to expected conditions in the real-time market not including reactive or black start services) should be allocated to real-time load, real-time exports and real-time wheels.

Energy uplift payments should be allocated to units not scheduled in the Day-Ahead Energy Market and committed in real time, but before the operating day, to the current deviation categories with the addition of up to congestion, wheels and units that clear the Day-Ahead Scheduling Reserve Market but do not perform.

Offsets based on internal bilateral transactions should be excluded. These costs should be allocated to the current deviation categories whenever the units receiving energy uplift payments are committed before the operating day.

Energy uplift payments should be allocated to units committed during the operating day to a new deviation category which would include physical transactions or resources (day-ahead minus real-time load, day-ahead minus real-time interchange transactions, generators and DR not following dispatch). This allocation would ensure that commitment changes that occur during the operating day and that result in energy uplift payments are paid by transactions or resources affecting the commitment of units during the operating day. For example, real-time load or interchange transactions that do not bid in the Day-Ahead Energy Market, generators and DR resources that do not follow dispatch would be

allocated these costs. Any reliability commitment should be allocated to real-time load, real-time exports and real-time wheels independently of the timing of the commitment.

Allocation of lost opportunity cost and canceled resources should be changed. LOC paid to units scheduled in the Day-Ahead Energy Market and not committed in real time should be allocated to deviations based on the proposed definition of deviations. LOC paid to units reduced for reliability in real time and payments to canceled resources should be allocated to real-time load, real-time exports and real-time wheels.

Table 2 shows the current allocation by energy uplift reason. For example, energy uplift payments to units scheduled in the Day-Ahead Energy Market are called day-ahead operating reserves. The costs for such reserves are paid by day-ahead load, day-ahead exports and decrement bids. Any additional payment resulting from the real-time operation of these units are called balancing operating reserves. The costs for such reserves are paid by either deviations or real-time load and real-time exports depending on the amount of intervals that the units are economic.

Table 2 Current energy uplift allocation[7]

Reason	Energy Uplift Category	Allocation Logic	Allocation
Units scheduled in the Day-Ahead Energy Market	Day-Ahead Operating Reserve	NA	Day-Ahead Load, Day-Ahead Exports and Decrement Bids
Units scheduled in the Day-Ahead Energy Market	Balancing Operating Reserve	LMP < Offer for at least four intervals	Real-Time Load and Real-Time Exports
		LMP > Offer for at least four intervals	Deviations
Unit not scheduled in the Day-Ahead Energy Market and committed in real time	Balancing Operating Reserve	Committed before the operating day for reliability	Real-Time Load and Real-Time Exports
		Committed before the operating day to meet forecasted load and reserves	Deviations
		Committed during the operating day and LMP < Offer for at least four intervals	Real-Time Load and Real-Time Exports
		Committed during the operating day and LMP > Offer for at least four intervals	Deviations
Units scheduled in the Day-Ahead Energy Market not committed in real time	LOC Credit	NA	Deviations
Units reduced for reliability in real time	LOC Credit	NA	Deviations
Units canceled before coming online	Cancellation Credit	NA	Deviations

7 *See* 2015 SOM (Section 4: Energy Uplift, Table 4-36).

Table 3 shows the Market Monitor's allocation proposal by energy uplift reason. The proposal eliminates the day-ahead operating reserve category and creates a new category for any energy uplift payments to units scheduled in the Day-Ahead Energy Market and committed in real time. This new category would be allocated to day-ahead transactions and resources. The proposal also eliminates the need to determine the number of intervals that units are economic to determine if the energy uplift charge should be allocated to deviations or to real-time load and real-time exports. In the proposal, any commitment instruction before the operating day would be allocated based on the proposed definition of deviations; any commitment instruction during the operating day would be allocated to physical deviations.

Table 3 Market Monitor energy uplift allocation proposal

Reason	Energy Uplift Category	Allocation Logic	Allocation
Units scheduled in the Day-Ahead Energy Market and committed in real time	Day-Ahead Segment Make Whole Credit	Scheduled by the day ahead model (not must run)	Day-Ahead Transactions and Day-Ahead Resources
		Scheduled as must run in the day ahead model	Real-Time Load, Real-Time Exports and Withdrawal Side of Real-Time Wheels
Units not scheduled in the Day-Ahead Energy Market and committed in real time	Real Time Segment Make Whole Credit	Committed before the operating day	Deviations
		Committed during the operating day	Physical Deviations
		Any commitment for reliability	Real-Time Load, Real-Time Exports and Withdrawal Side of Real-Time Wheels
Units scheduled in the Day-Ahead Energy Market not committed in real time	Day-Ahead LOC	NA	Deviations
Units reduced for reliability in real time	Real-Time LOC	NA	Real-Time Load, Real-Time Exports and Withdrawal Side of Real-Time Wheels
Units canceled before coming online	Cancellation Credit	NA	Real-Time Load, Real-Time Exports and Withdrawal Side of Real-Time Wheels

Table 4 shows energy uplift charges based on the current allocation and energy uplift charges based on the Market Monitor's allocation proposal including the Market Monitor's recommendations regarding energy uplift credit calculations. Total charges (excluding black start and reactive services charges) would have been reduced by $127.6 million or 10.7 percent in 2014 and 2015 if three recommendations regarding energy uplift credit calculations proposed by the Market Monitor had been implemented. The elimination of the day-ahead operating reserve credit would have resulted in a decrease of $55.7 million, the proposed changes to lost opportunity cost calculations would have

resulted in a decrease of $57.4 million and the use of net regulation revenues offset would have resulted in a decrease of $14.2 million.[8]

Table 4 shows that deviations charges would have been reduced by $319.2 million or 64.4 percent. The reason for this change is that, besides the reduction in the overall charges, under the Market Monitor proposal, a subset of charges is reallocated to a new physical deviation category (based on the timing of the commitment of the resource being paid energy uplift) and another subset of charges is allocated to real-time load, real-time exports and real-time wheels (based on reliability actions).

Table 4 Current and proposed energy uplift charges by allocation (Millions): 2014 and 2015[9] [10]

Allocation	2014	2015	Total
Current			
Day-Ahead Demand, Day-Ahead Exports and Decrement Bids	$111.3	$98.7	$210.0
Real-Time Load and Real-Time Exports	$447.1	$41.1	$488.2
Deviations	$337.7	$157.7	$495.4
Total	$896.1	$297.5	$1,193.6
Proposal			
Day-Ahead Transactions and Day-Ahead Resources	$47.0	$27.5	$74.5
Real-Time Load and Real-Time Exports	$461.4	$99.7	$561.0
Deviations	$107.0	$69.2	$176.1
Physical Deviations	$203.2	$51.1	$254.4
Total	$818.6	$247.5	$1,066.1
Impact			
Impact ($)	($77.5)	($50.0)	($127.6)
Impact (%)	(8.7%)	(16.8%)	(10.7%)

The Market Monitor calculated the rates that participants would have paid in 2014 and 2015 if all the Market Monitor's recommendations on energy uplift had been in place. These recommendations have been included in the analysis: day-ahead operating reserve

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8 The total impact of the elimination of the day-ahead operating reserve credit and the impact of net regulation revenues offset is greater because they also impact black start and reactive services charges.

9 *See* 2015 SOM (Section 4: Energy Uplift, Table 4-38).

10 These energy uplift charges do not include black start and reactive services charges.

elimination; net regulation revenues offset; implementation of the proposed changes to lost opportunity cost calculations; reallocation of operating reserve credits paid to units scheduled as must run in the Day-Ahead Energy Market (for reasons other than reactive or black start services); reallocation of operating reserve credits paid to units supporting the Con Edison–PJM Transmission Service Agreements; elimination of internal bilateral transactions from the deviations calculation; allocation of energy uplift charges to up to congestion transactions and the Market Monitor's energy uplift allocation proposal.

Table 5 shows the energy uplift cost of a 1 MW transaction if these recommendations had been implemented in 2014 and 2015. Table 5 assumes two scenarios under the Market Monitor proposal. The first scenario assumes that 50 percent of all up to congestion transactions cleared volume would have remained prior to September 8, 2014, and all up to congestion transactions cleared volume would have remained after September 8, 2104. The second scenario assumes zero volume of up to congestion transactions in 2014 and 2015. Table 5 shows for example that a decrement bid in the Eastern Region (if not offset by other transactions) would have paid an average rate of $0.215 and $0.149 per MWh in the 2014 and 2015, under the first scenario, $2.189 and $1.038 per MWh less than the actual average rate paid. Up to congestion transactions sourced in the Eastern Region and sinking in the Western Region would have paid an average rate of $0.393 and $0.296 per MWh in 2014 and 2015 under the first scenario. Table 5 shows the current and proposed averages energy uplift rates for all transactions.

Table 5 Current and proposed average energy uplift rate by transaction: 2014 and 2015[11]

		2014			2015		
	Transaction	Current Rates ($/MWh)	Proposed Rates - 50% UTC ($/MWh)	Proposed Rates - 0% UTC ($/MWh)	Current Rates ($/MWh)	Proposed Rates - 50% UTC ($/MWh)	Proposed Rates - 0% UTC ($/MWh)
East	INC	2.275	0.215	0.681	1.072	0.149	0.383
	DEC	2.404	0.215	0.681	1.187	0.149	0.383
	DA Load	0.129	0.020	0.024	0.115	0.013	0.015
	RT Load	0.450	0.466	0.466	0.050	0.118	0.118
	Deviation	2.275	1.303	1.765	1.072	0.501	0.732
West	INC	2.069	0.177	0.568	1.036	0.147	0.383
	DEC	2.199	0.177	0.568	1.151	0.147	0.383
	DA Load	0.129	0.020	0.024	0.115	0.013	0.015
	RT Load	0.439	0.466	0.466	0.042	0.118	0.118
	Deviation	2.069	1.218	1.604	1.036	0.432	0.666
UTC	East to East	NA	0.430	1.362	NA	0.299	0.765
	West to West	NA	0.355	1.136	NA	0.294	0.766
	East to/from West	NA	0.393	1.249	NA	0.296	0.766

G. Demand Response Energy Uplift

PJM responses did not address the allocation of all sources of energy uplift. In PJM all energy payments to demand response resources are also uplift payments. The energy payments to these resources are not part of the supply and demand balance, they are not paid by LMP revenues and therefore the energy payments to demand response resources have to be paid as out of market uplift. The energy payments to economic DR are funded by real-time load and real-time exports. The energy payments to emergency DR are funded by participants with net energy purchases in the Real-Time Energy Market.

H. MISO Energy Uplift Allocation Construct

The Market Monitor agrees with PJM that it is not possible to determine causality at the level of an individual transaction (e.g. load withdrawal, generator injection, virtual transaction). Both the current PJM construct and the Market Monitor's proposal incorporate the cost causality principle to arrive at a reasonable allocation method. Energy uplift is affected by numerous factors, including supply, demand, prices, commitment reason, unit operating parameters, forecast models, and day-ahead versus real-time modeling differences, among others.

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[11] The deviation transaction means load, interchange transactions, generators and DR deviations.

Although it is asserted that the MISO approach assigns uplift to individual transactions based on their individual impact on uplift, that is not the way the MISO allocation actually works. In actual operation, the MISO approach relies on predetermined categories to allocate uplift to transaction types. The MISO construct relies on studies performed periodically to determine the share of energy uplift that should be allocated to participants that only affect transmission constraints and the share of energy uplift that is allocated to participants that affect power balance. These studies make assumptions on how much of the generation needed to provide transmission relief was also needed to meet load. The MISO construct also assumes that the impact of either type of participant is on an hourly basis. The studies are based on static snapshots of system conditions rather than a dynamic model.

The Market Monitor disagrees with the approach taken in the MISO studies to allocate uplift costs. It is not possible to assign energy uplift to transactions simply based on whether transactions help or hurt a transmission constraint or impact power balance. The MISO construct makes simplistic assumptions about cost causation that are not applicable to a market as dynamic as the electricity market. Helping a constraint does not mean that no uplift results. In fact, a transaction that helps a constraint can directly result in increased uplift. Under the MISO approach, a transaction that occurs outside of a resource's scheduled hours will not have to pay for any constraint based uplift associated with that unit even though that transaction has an effect on the rest of the 24 hour day-ahead model.

In some uplift categories, MISO did not implement a consistent cost causation approach. MISO allocates price volatility make whole payments (real-time offer revenue sufficiency guarantee payment and real-time offer revenue sufficiency guarantee payment) to real-time load as part of the real-time revenue neutrality uplift. These payments are also energy uplift payments. The allocation of these energy uplift payments seems to imply that real-time load is the only cause of this type of uplift. This is a broad and simplistic conclusion since uplift is not only a function of real-time load.

I. Transparency

Energy uplift charges are out of market, non-transparent payments made to resources operating at PJM's direction. Energy uplift charges are highly concentrated in a small number of zones and paid to a small number of PJM participants. These costs are not reflected in PJM market prices. Current confidentiality rules prevent the publication of detailed data concerning the reasons and locations of these payments, making it difficult for other participants to compete with the resources receiving energy uplift payments. Uplift charges are not included in the transmission planning process meaning that transmission solutions are not considered. The confidentiality rules were implemented in order to protect competition. The application of confidentiality rules in the case of energy uplift information does exactly the opposite. Energy uplift is not a market and the absence of relevant information creates a barrier to entry. The MMU recommends that PJM revise the current energy uplift confidentiality rules in order to allow the disclosure of energy uplift credits by zone, by owner and by resource.

When units receive substantial revenues through energy uplift payments, these payments are not transparent to the market because of the current confidentiality rules. As a result, other market participants, including generation and transmission developers, do not have the opportunity to compete to displace them. As a result, substantial energy uplift payments to a concentrated group of units and organizations has persisted for more than ten years.

On March 31, 2016, the PJM Markets and Reliability Committee approved changes to the data posting confidentiality rules contained in PJM Manual 33: Administrative Services for the PJM Interconnection Operating Agreement. The new rules will allow PJM to post certain individual resource outages related to system events, demand response available in localized areas (three zip codes or greater), cleared and offered capacity in the capacity market auctions aggregated by transmission zone, energy uplift information by zone and

operating day (or longer period), and aggregated statistics related to the execution and results of three pivotal supplier test.

The Market Monitor recommended in 2011 that PJM clearly identify and classify all reasons for incurring operating reserves.[12] PJM began this process in 2014. This is also an important contribution to transparency.

The MMU recommends that PJM revise the current operating reserve confidentiality rules in order to allow the disclosure of complete information about the level of operating reserve charges by unit and the detailed reasons for the level of operating reserve credits by unit in the PJM region.

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12 *See* the 2012 Quarterly State of the Market Report for PJM: January through September (Nov. 15, 2012) at 87.

II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as the Commission resolves the issues raised in this proceeding.

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Dated: April 6, 2016

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Eagleville, Pennsylvania,
this 6th day of April, 2016.

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