UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)	Docket No. EL14-37-000

COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to the Commission's Notice Inviting Post-Technical Conference Comments issued in this proceeding April 29, 2015, Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM[1] ("Market Monitor"), submits these comments.

I. COMMENTS

A. FTR Forfeiture Rule

1. Calculating How Virtual Transaction Contribute to Power Flows.

a. When calculating the contribution a virtual transaction (INC, DEC, or UTC) has to power flowing across a given constraint, how should the injection/withdrawal points for the virtual transaction be identified?

Under the current FTR forfeiture rule, which calculates forfeitures on the basis of individual virtual transactions, the defined selection of injection/withdrawal points is appropriate for INCs and DECs. Using the largest impact ("worst case") node on the constraint provides the most direct measure of power flow across the individual constraint

[1] PJM Interconnection, L.L.C. ("PJM") is a Commission-approved Regional Transmission Organization. Capitalized terms used herein and not otherwise defined have the meaning used in the PJM Open Access Transmission Tariff ("OATT") or the PJM ("OA").

resulting from a virtual transaction, which is what the current FTR forfeiture rule is designed to do.

It is important to consider all elements of the FTR forfeiture rule together. The use of the largest impact node is packaged with the use of a very high 75 percent threshold for the difference in distribution factors (dfaxes) between injection point and largest impact withdrawal point. The combined effect of the choice of node and threshold must be considered. If another approach to the largest impact point were taken, the threshold would also have to be reconsidered and potentially significantly reduced.

The FTR forfeiture rule should treat also UTCs in the same way that INCs and DECs are treated. The power injected or withdrawn from a UTC transaction, on an individual constraint, does not depend on where the UTC source/sink points are located, but on the net impact of the UTC when it flows across a constraint.

In the application of the FTR forfeiture rule to UTCs proposed by the Market Monitor, the net impact of a UTC is defined by the net impact of the UTC's paired injection and withdrawal on the constraint. The UTC results in a net injection or withdrawal that must then flow across a constraint to a source or sink point. Under the current rule, that source or sink point should be the largest impact node, as it is for INCs and DECs.

Applying the FTR forfeiture rule to UTCs under the assumption that power flows directly from the UTC injection point to the UTC withdrawal point is inconsistent with the application of the FTR forfeiture rule to INCs and DECs. This approach is inconsistent with the basic nature of power flows in a transmission system. The power flows follow the same rules regardless of the type of transaction. The application of these faulty assumptions inappropriately weakens the FTR forfeiture rule as it is applied to UTCs.

b. Should the defined "worst case" node be limited to the market participant's own transactions?

The largest impact ("worst case") node cannot be limited to the market participant's own transactions. Power balance must be maintained on the overall system, so any injection or withdrawal at one point must be withdrawn or injected at another point on the system

regardless of ownership. The flow of power must be from the virtual injection to a defined withdrawal point.

If only the transactions of a participant are considered when determining the impact of a virtual transaction on a constraint, it is equivalent to assuming that power injected by a participant can be withdrawn only by that participant and that the power would flow to a withdrawal point of that participant. This is clearly not correct. This approach is inconsistent with the basic nature of power flows in a transmission system. The power flows follow the same rules regardless of the ownership of the transaction. For example, the participant could have an injection close to a constraint and a withdrawal not related to the constraint. For example, how would a participant with a single INC be treated? Under the hypothetical approach to the rule, the participant has no withdrawal points and therefore has zero power flow and zero impact. Clearly, a participant can affect flows on a constraint and congestion and the value of its FTRs using only INCs or only DECs. As a result it would not be appropriate to exempt such a participant from the FTR forfeiture rule as the proposed hypothetical approach would do. In addition, this approach would create an easy way to evade the rule. If the objective is to only consider a participant's own transactions, a completely revised FTR forfeiture rule should be considered.

c. Additionally, should the impact threshold(s) used for triggering the forfeiture rule remain at 75 percent regardless of the injection/withdrawal points identified? Why or why not?

It is important to consider all elements of the FTR forfeiture rule together. The use of the largest impact node is coupled with the use of a very high 75 percent threshold for the difference in dfaxes between injection point and largest impact withdrawal point. The combined effect of the choice of node and threshold must be considered. If another approach to the largest impact point were taken, the threshold would also have to be reconsidered and potentially significantly reduced.

2. How to Treat Portfolios of Market Transactions

a. As an alternative to the current approach of assessing one virtual transaction at a time, should the FTR forfeiture rule collectively assess the net impact of a market participant's entire portfolio of INCs, DECs, and UTCs?

Yes. A portfolio approach should be developed and implemented.

b. Should it assess the net impact of all virtual transactions that clear the market?

A new forfeiture rule should be created that accounts for the net impact of a participant's virtual portfolio on a constraint, including INCs, DECs and UTCs. In this approach a UTC would be included in the participant's portfolio as an injection (INC) at its source point and a withdrawal (DEC) at its sink point. The net effect of a participant's entire virtual portfolio is a better measure of the participant's effect on a constraint than the effect of each of a participant's individual virtual bids considered in isolation or in some combination with another injection or withdrawal point. A participant's portfolio may contain virtuals that both help and hurt the constraint. This possibility is not captured under the current rule.

In any new approach that considers a participant's entire portfolio, a new triggering threshold must be established.

c. In addition to virtual transactions, should a market participant's portfolio of physical transactions be considered? Why or why not?

Consideration should be given to whether the FTR forfeiture rule should be applied to physical transactions. Out of merit inflexible generation injections, for example, could be used to manipulate FTR prices. While a concern, the Market Monitor believes that developing an appropriate rule to consider physical transactions may be beyond the scope of the current proceeding and would require a detailed discussion that would further complicate the issues under consideration here.

d. If a portfolio approach were adopted, should the impact threshold(s) continue to be 75 percent, as used in the past, or is a different threshold(s) more appropriate? How could a portfolio approach be implemented?

It is important to consider all elements of the FTR forfeiture rule together. In the current rule, the use of the largest impact node is coupled with the use of a very high 75 percent threshold for the difference in dfaxes between injection point and largest impact withdrawal point. The combined effect of the choice of node and threshold must be considered. The threshold would also have to be reconsidered and significantly reduced under a portfolio approach.

3. Exemptions from the FTR Forfeiture Rule

a. Should counter-flow FTRs and bids that relieve congestion remain exempt from FTR forfeiture rule calculations?

No. Counterflow FTRs should be included in the rule as virtual transactions can affect the value of a counterflow FTR in the same way that they affect the value of a prevailing flow FTR.

b. Should financial transactions that improve day-ahead and real-time market price convergence be exempt from the forfeiture rule? Why or why not?

The current FTR forfeiture rule addresses the convergence issue appropriately. The current rule limits FTR forfeiture to cases where day ahead congestion is greater than real time congestion and exempts all cases where virtual transactions increase day ahead congestion to a level less than or equal to real time congestion. There is no reason to permit virtual transactions which lose money to increase day ahead congestion to greater than real time congestion to make an FTR more valuable. It would be reasonable to eliminate even the current exemption because it constitutes entering into a losing transaction in order to make a related transaction more valuable.

If a participant has no FTRs and therefore would not profit from making the FTRs more valuable, there is no limit to the price impacts from a participant's virtual positions. The FTR rule links taking losses on virtual positions to making FTRs more valuable as a

form of manipulation which should be prevented by rule. The alternative to a rule is case by case enforcement which would be impractical and inefficient.

c. How, if at all, would these exemptions differ when assessing the impact of a market participant's portfolio as opposed to one INC, DEC, or UTC at a time?

There should be no exemptions under a portfolio approach.

d. Are there any other currently exempt financial transactions that should be subject to FTR forfeiture calculations?

There should be no exemptions for counterflow FTRs when considering a participant's entire portfolio. In fact, the use of a portfolio approach makes it even more clear that no transactions should be exempt from the rule. Counterflow FTRs are clearly part of some participants' portfolios. It would be discriminatory to exclude counterflow FTRs from the portfolio evaluation.

4. Should the application of the forfeiture rule to INCs, DECs and UTCs be revised in ways not addressed by these questions, and if so, describe in detail the proposed revision and justification for the change.

No.

5. If you believe that changes to the current FTR Forfeiture Rule provisions of PJM's tariff are necessary, propose appropriate tariff language that you believe addresses your concern.

PJM's tariff needs substantial changes in order to incorporate the Market Monitor's recommendations. The Market Monitor is developing language and may file a supplemental pleading including such language in this proceeding.

B. Uplift

1. How Should Uplift Be Assigned to Virtual Transactions

a. Should UTCs be assessed uplift? Explain why or why not.

Yes. UTCs should pay uplift charges. Uplift credits are paid to market participants under specific conditions in order to ensure that resources do not operate for the PJM system at a loss. Uplift credits to some market participants must be paid as uplift charges by other market participants. Resources could operate for PJM at a loss for several reasons,

including not covering costs (startup and no load costs) through market prices, running for constraints not modeled in the day-ahead or real-time models, not covering costs while operating in non-profitable hours due to resources' operational limits (minimum run times, minimum down times), among others. All these factors are affected by unit commitment, unit dispatch and market prices in the Day-Ahead and Real-Time Energy Markets. Transactions that impact these factors should be allocated uplift charges. UTCs affect unit commitment, dispatch and prices.

Both UTCs and wheeling transactions affect unit commitment, dispatch and prices but are not allocated uplift charges. Both the Market Monitor and PJM have conducted studies that show that UTCs, like any other day-ahead injection and/or withdrawal affect unit commitment, dispatch and prices.[2] UTCs' demonstrated impact on unit commitment, unit dispatch and system prices is the basis of the Market Monitor's recommendation that UTCs be allocated uplift charges just like other injection and/or withdrawal transaction in the Day-Ahead Energy Market and like other injection and/or withdrawal deviation from the Day-Ahead Energy Market.

b. If so, how, if at all, should this allocation differ from the allocation to individual INCs and DECs and "paired" INCs and DECs?

The Market Monitor recommends that the injection and withdrawal side of UTCs be separately allocated uplift charges. There is no reason to provide arbitrary preferential treatment to UTCs relative to INCs and DECs or any other day-ahead injection or withdrawal or any other injection or withdrawal deviation from day ahead which currently pays uplift.

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[2] *See* 2014 State of the PJM Market for PJM, v. II (August 14, 2014) at 139–178; *see also* IMM MC Webinar presentation of June 24, 2013; PJM June 5th UTC Study (first study) and PJM Presentation to MC Webinar, June 24, 2013 (second study) which can be accessed at: <*http://www.pjm.com/~/media/ committees-groups/task-forces/ttf/20120607/20120607-utc-analysis-construction-presentation.ashx*> ("PJM June 24th UTC Study"); February 7, 2014 PJM UTC Study submitted to the Commission (EL13-1654-000) at 8–9.

c. Should INCs and DECs continue to be required to pay uplift charges?

Yes. INCs and DECs should continue to pay uplift charges due to their effect on commitment and dispatch. The Market Monitor has made a number of proposals to modify the definition of uplift payments and uplift allocation. One of the results of such recommendations would be to substantially reduce the uplift paid per MWh by INCs and DECs.[3]

d. What effect does imposing these charges have on the ability of virtual traders to arbitrage day-ahead and real-time price differences?

The allocation of uplift charges does reduce the ability to profit from differences between day-ahead and real-time prices. The allocation of uplift also reduces the ability of physical participants to benefit and profit from their participation in PJM markets. Uplift is an unavoidable part of wholesale LMP-based power markets. While in concept no participant should pay uplift, in fact all participants must pay uplift based on their role in the markets. The payment of uplift by virtuals is appropriate because virtual trading has an impact on unit commitment and dispatch and thus contributes to uplift charges. To remove the appropriate allocation of uplift to virtuals would provide an inefficient incentive to virtual transactions to engage in unlimited speculative trading. This was demonstrated by the activities of UTC traders from September 17, 2010, the date on which all but a de minimis level of administrative charges (less than $0.05 per MWh) was removed from UTCs, through September 8, 2015, the date which FERC set as the start date for paying a subsequently defined uplift charge by UTCs. The dramatic increase in UTC bids was comprised, in substantial part, of bids with very low price differences. With effectively no charges for bids, UTCs were given a free option to speculate on price differences in the PJM

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[3] *See* 2014 State of the Market Report for PJM, v. II (August 14, 2014) at 139–178.

markets. The extremely large volume of UTCs slowed the clearing of the Day-Ahead Market. The increase in UTC bids also increased day-ahead congestion events.

Convergence is not the goal of virtual trading, merely a possible outcome. The degree of convergence, by itself, is not a measure of the competitiveness or effectiveness of the Day-Ahead Energy Market. Price convergence does not necessarily mean a zero or even a very small difference in prices between Day-Ahead and Real-Time Energy Markets. In addition, convergence in the sense that day-ahead and real-time prices are equal at individual buses or aggregates on a day to day basis is not a realistic expectation as a result of uncertainty, lags in response time and modeling differences, including differences in modeled contingencies and marginal loss calculations, between the Day-Ahead and Real-Time Energy Market.

Where arbitrage incentives are created by modeling differences, such as differences between the day-ahead and real-time modeled transmission contingencies and marginal loss calculations, virtual bids and offers cannot result in convergence. Such offers may be profitable but cannot change the underlying reason for the price difference. This is termed false arbitrage because it cannot lead to price convergence.

2. Do UTCs impact unit commitment decisions? If so, how? Several views were expressed during the conference. For example, one panelist cited PJM documentation stating that UTCs are not included in commitment decisions. Other panelists expressed the view that both "paired" INCs and DECs and UTC's impact unit commitment.

While PJM Manual 11 states that "PJM does not commit additional generation to support up-to congestion" in its reliability run resource commitment process, the manual does not state that UTCs do not affect PJM's unit commitment process.[4] The reliability run resource commitment process does not represent PJM's entire day-ahead commitment process. PJM's reliability run resource commitment process is the first pass of PJM's day-

[4] *See* PJM Manual 11 (Energy & Ancillary Services Market Operations.

ahead market solution. The reliability run resource commitment process results in a commitment solution using a very limited constraint set. The resulting commitment solution provides the basic energy (limited constraints) related commitment used as the initial solution (start point) for the full day-ahead market model. This first pass initial commitment process does not include UTCs bids at all. In other words, UTCs bids are not included and do not clear in this first commitment pass. As they are not included or cleared in the first commitment pass, they do not affect congestion, do not affect dispatch, do not affect commitment, do not affect LMPs, and do not contribute to convergence or divergence in the initial commitment solution. This is not true of subsequent day ahead market solution passes that do include UTCs bids. In later passes of the day-ahead market solution process, UTCs bids are included in the market models and they do affect unit commitment, dispatch, congestion and prices.

That UTCs affect unit commitment in the PJM's Day-Ahead Market is no longer in dispute. PJM has stated that UTCs can affect unit commitment and dispatch.[5] PJM's studies have demonstrated that UTCs can contribute to differences in unit commitment between day ahead and real time. PJM studies have demonstrated that UTCs can affect dispatch and that they can affect unit commitment. By affecting unit commitment and dispatch UTCs affect operating reserve charges. As UTCs affect operating reserve charges they should be treated like other bids for purposes of the allocation of operating reserve charges.

Ignoring losses, UTCs do not affect system power balance. However, it is important not to confuse an absence of an effect on system power balance with an absence of effect on the system solution, including prices, congestion, binding constraints, dispatch and unit commitment. UTCs do, like any injection or withdrawal, have an impact on commitment and dispatch, dependent on the distribution factors of the source and sink locations. If a

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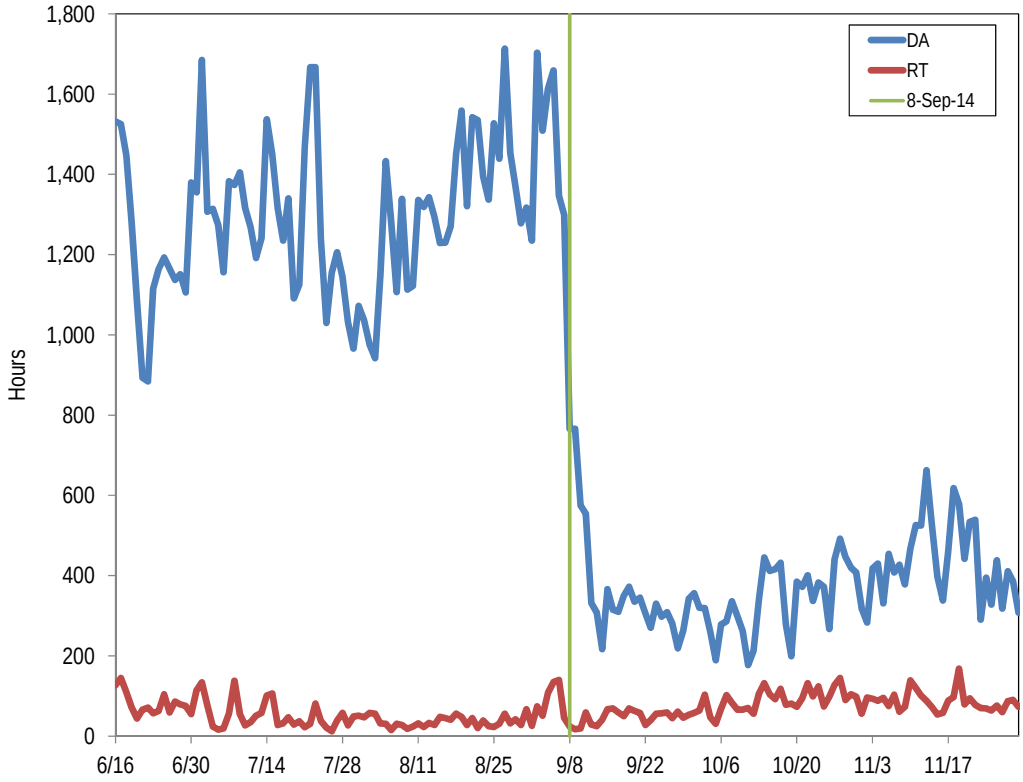
5 *See* PJM June 24th UTC Study.

submitted INC and DEC both cleared for the same MW value and at the same nodes as the UTC, the INC and DEC would have exactly the same effect on the system as the UTC.

UTCs affect commitment in constrained hours and they increase the number of constraints that occur in the Day-Ahead Market. While UTC transactions are paired, the power injected at the UTC source is not all withdrawn at the UTC sink. The power flows across the system based on the characteristics (impedances) of the transmission system and is withdrawn at multiple points. For example, in a constrained system, if a UTC increases congestion on a constraint (by sourcing on the unconstrained side and sinking on the constrained side) the UTC will require the simultaneous increase in generation in the constrained area and decrease in generation in the unconstrained area to prevent the violation of the constraint. This is because the binding constraint, by definition, prevents the UTC injection from actually flowing from the UTC source to the UTC sink. Once a constraint is binding, the dfax of the UTC source and sink to the constraint indicates the portion of the UTC flow that affects the constraint and thereby contributes to the need to relieve the constraint to maintain system security. To maintain system security, the induced flow in excess of line limits (the relief required) must be offset by increases in net injections on the constrained side and/or decreases in net injections on the unconstrained side. This accommodation of the UTC flow increases congestion. The offsetting increases and/or decreases in net injections within the least cost security constrained dispatch contribute to the costs to relieve the constraint, which is reflected in the shadow price of the constraint (the marginal cost to relieve the constraint) and increased congestion.

UTC transactions, like INCs and DECs, can increase or decrease flows on constraints, contributing to the need for constraint relief, which affects congestion on the constraint, unit commitment, unit dispatch and prices. Analysis shows that UTCs have a significant effect on the number of day-ahead constraint hours. Figure 1 shows the number of day-ahead and real-time constraint hours for the June 16 through November 30, 2014, period. The figure shows that a significant reduction in day-ahead constraint hours was the result of the reduction in UTCs that began on September 8, 2014.

Figure 1 Day-ahead constraint hours versus real-time constraint hours: June 16 through November 30, 2014



Finally, if UTCs did not affect unit commitment decisions they could not affect price convergence.

3. Netting INCs/DECs

a. Should market participants be allowed to net INC and DEC transactions for the purpose of uplift allocations? Why or why not?

No. Participants cannot net injections and withdrawals under the current rules. The current rules should remain in effect with the exception of injections and withdrawals that are made at the same node in the same interval by the same participant. Netting across locations/nodes should not be allowed because each transaction has a different impact on unit commitment, unit dispatch and system prices depending on their location. Netting across locations/nodes creates the incentive to place transactions for the sole purpose of reducing uplift charges without providing any benefits to the system.

b. If yes, should netting within a market participant's portfolio (intra-market participant) be allowed or should market-wide (inter-market participant) netting be allowed?

Injections and withdrawals, physical or virtual, should not be netted for the purpose of uplift allocations. Unless made at the same node, there is no reason to believe that matched injections and withdrawals cancel out any effect on unit commitment, dispatch or price in a constrained system where injections and withdrawals, matched or not, affect constraints on the basis of their relative dfax, not just their relative magnitude. Matched injections and withdrawals can cause a series of constraints to bind if the injection is on the unconstrained side of the system and the withdrawal is on the constrained side of the system. The exception to this would be injections and withdrawals made at the same node (virtual or physical), as the net flow (as an injection or withdrawal) from the node would be of concern in the optimization.

The 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. 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. Using netting to decrease the transactions over which those charges are spread would increase the impact of energy uplift charges on markets in a discriminatory manner.

c. Should physical assets be included in the netting process? Please discuss the advantages and disadvantages to both approaches.

The current rules should remain in effect with the exception of injections and withdrawals that are made at the same node in the same interval by the same participant, including physical transactions. Netting across locations/nodes should not be allowed for virtual or physical transactions because each transaction has a different impact on unit

commitment, unit dispatch and system prices depending on their location. Netting across locations/nodes creates the incentive to place transactions for the sole purpose of reducing uplift charges without providing any benefits to the system.

Allowing physical assets not in located at the same node to net their deviations will result in a preferential treatment compared to other transactions.

4. Other Cost-Causation Approaches

a. Are there other cost-causation approaches that should be considered?

No. Cost causation is a misapplied concept in the discussion of uplift allocation. It is possible to assign costs to categories based on the reasons the costs are incurred and to allocate the costs in those categories to classes of participants based on the role of the participant group in causing those costs. But it is not possible to accurately assign individual costs to participant classes or individual participants.

Determining direct causal links between market activity, product types and incurred uplift costs is not possible as a practical matter. An activity or product type which increases uplift on one day could, given all the other activity on the system, decrease uplift on another day.

In order to establish a cost causation approach to uplift allocation, the market operator would have to execute a large number of scenarios for each market solution in order to determine the impact of all transactions on commitment, dispatch and prices. RTOs have relied on more simplistic and practical approaches.

Uplift allocation approaches range from allocating uplift to load (least elastic market participant), to allocating uplift based on defined criteria. None of these are cost causation approaches.

b. What advantages, disadvantages, and operational challenges would be associated with implementing such approaches in PJM?

The disadvantage of trying to establish a cost-causation approach is that it is not possible to do correctly and therefore pursuing cost-causation approaches is a waste of resources. RTOs should focus on establishing a set of defined nondiscriminatory criteria for

cost causation. Transactions that may have different impact on unit commitment, unit dispatch and system prices should be grouped and allocated uplift costs based on their overall activity and the uplift associated with each market. For example, allocating uplift based on the match between the time at which resources are committed and the time of market activity is based on cost-causation. Transactions that may have an impact on commitment and dispatch changes in the Day-Ahead Energy Market or before the operating day would be allocated uplift associated with resources committed or decommitted during these periods and transactions that may have an impact on commitment and dispatch changes in real time would be allocated uplift associated with resources committed or decommitted in real time. The result is that transactions would pay their share of uplift based on the impact that they could have had on the market. This is the application of cost causation principles.

5. **If virtual transactions are assessed uplift, should the uplift be designed as a fixed amount known in advance to permit the traders to assess the costs of the trade versus the potential arbitrage differences between day-ahead and real-time?**

No. Virtual traders requesting to be charged a fixed uplift rate in order to reduce uncertainty are asking that other market participants subsidize their risk. This is exactly the opposite of the appropriate outcome. Virtuals are used by financial participants in large part to speculate in markets. If any market participants should appropriately bear the full risk of their activities it is such financial participants. Virtual participants have yet to explain why other participants should subsidize their risk. There is no good reason. All participants would like to have a fixed uplift rate but uplift is inherently variable and that variability will not disappear if it is allocated from virtual to physical participants. In fact, such a reallocation will amplify the risk borne by physical participants. It is important for market efficiency and market incentives that all market participants pay their share of uplift for the day it is incurred.

The purpose of the competitive market design is to serve load at the lowest possible cost. The Commission uses competitive markets to replace cost of service regulation as a way to achieve just and reasonable rates. There is no right to trade virtuals in the market design. The only reason to include virtuals is if they contribute to the goal of competitive markets. Such a conclusion has not yet been firmly established based on data and analysis. Virtual trading should be included in competitive markets only to the extent that such trading facilitates more efficient and competitive physical markets.

There is no reason to eliminate uplift related risk from virtual bids relative to physical bids in the PJM market. The allocation of uplift should only be linked to the ability to affect uplift. The allocation of uplift charges reduces opportunities for profitable arbitrage by virtual bids, but this is appropriate. Virtual bids, through their effect on commitment and dispatch (which affect potential convergence), affect uplift.

6. If you believe that changes to the current Uplift provisions of PJM's tariff are necessary, propose appropriate tariff language that you believe addresses your concern.

PJM's tariff needs substantial changes in order to incorporate the Market Monitor's recommendations.

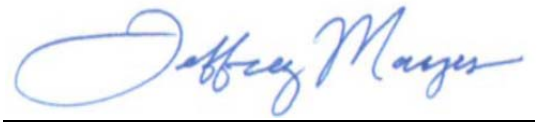
C. Further Responses to the Questions Posed in the Commission Staff's December 10, 2014 Supplemental Notice of Technical Conference.

The Market Monitor has no further comments at this time.

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.

Respectfully submitted,



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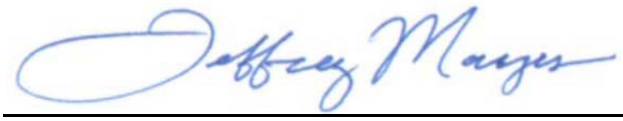
Dated: May 29, 2015

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 29th day of May, 2015.



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