

Comments of Roy J. Shanker, Ph.D.
In the Matter of PJM Up-to Congestion Transactions
Federal Energy Regulatory Commission
Docket No. IN10-5-000

November 11, 2013

Introduction and Background

1) My name is Roy J. Shanker. I have been engaged by Powhatan Energy Fund LLC (Powhatan) and its counsel, Drinker Biddle & Reath LLP (Drinker), to review the record in the above referenced investigation and to assess the Preliminary Findings put forward by the Federal Energy Regulatory Commission (FERC) Enforcement Staff (Enforcement, or Staff) in its paper issued August 9, 2013 (Staff Paper, Enforcement Paper, or Preliminary Findings).¹ In preparing these comments, I have reviewed materials and have relied on my professional and educational experiences. While these comments reflect my professional opinion at this time, they are not intended to be a formal affidavit in the related FERC docket.

2) The materials I have reviewed include various filings and Commission Orders in Docket EL08-14², the Staff Paper, Comments Submitted by the Independent Market Monitor (IMM) in ER13-164, the Written Submission to Commission Investigation Staff on Behalf of Dr. Houlian Chen (IN10-5)(December, 2010), the Written Submission to Commission Investigation Staff on Behalf of Powhatan Energy LLC (IN10-05)(October 21, 2011) and the Affidavits of Dr. Craig Pirrong and Dr. Richard Tabors that accompanied those two submissions. I have also reviewed related documents from PJM and State of the Market reports from the IMM.

3) My industry knowledge is extensive and relevant as it relates to this particular review of market behavior. I have worked as a consultant in the energy industry for approximately

¹ Re: Preliminary Findings of Enforcement Staff's Investigation of Up To Congestion Transactions by Dr. Houlian Chen on Behalf of Himself and the Principals of Huntrise Energy Fund LLC and Powhatan Energy Fund, LLC, Docket No. IN10-5-000, August 9, 2013.

² Collectively referred to as Black Oak I, II, and III.

40 years, with a particular focus on the electric utility industry since approximately 1976. I have been an independent consultant since 1981. Most relevant here, I have been an active participant in the design, development and conduct of the PJM Interconnection LLC (PJM) Regional Transmission Organization (RTO) market since at least 1995. My first engagement related to PJM pre-RTO markets was in 1977. I have been active in the stakeholder processes associated with the current RTO market design for over 18 years. Significantly, I have remained engaged in the PJM stakeholder process in recent years and have witnessed in “real time” many of the stakeholder discussions and related debate about the rules associated with Up-To Congestion (UTC) transactions. I am fully engaged in the PJM stakeholder process and frequently discuss related issues with PJM Staff, the PJM Independent Market Monitor and many other market participants. During my career, I have had over 600 different engagements in the industry, and over 200 regulatory proceedings including many where I have served as an expert or as an invited speaker at technical sessions before the FERC. A significant number of these engagements have related to enforcement investigations or actions undertaken by the FERC. In other engagements, I have supported just about every sector of the industry including large investor utilities, large industrial electric customers, municipalities and local governments, project developers, project investors and lenders and regulators. I have also served as an arbitrator with respect to contractual agreements in the electric markets.

4) I received my bachelor’s degree in Physics from Swarthmore College and a master's degree and doctorate in Industrial Administration from Carnegie Mellon University.

Summary of the Dispute

5) The Preliminary Findings conclude that certain trading activity by Dr. Houlian "Alan" Chen between the months of February and August 2010 on behalf of his own funds (HEEP Fund Inc., CU Fund) and on behalf of Huntrise Energy Fund, LLC and Powhatan Energy Fund LLC (Investor Funds) manipulated the market by responding to open, transparent,

Commission-directed, economic incentives by engaging in certain UTC transactions (Disputed Transactions).³ Among the various economic factors influencing the Disputed Transactions include the Marginal Loss Surplus Allocation (MLSA), which is sometimes also referred to as the Transmission Loss Credit (TLC, or Credits). Enforcement Staff erroneously concludes that the Disputed Transactions were “wash” transactions and constituted fraudulent behavior.

6) As I will discuss in more detail below, I strongly disagree with the Preliminary Findings. Dr. Chen and the Investor Funds were simply engaging in rational economic decision-making. The Disputed Transactions were exposed to risk. The Disputed Transactions were not wash trades. In summary, there is no basis for any finding of manipulation.

Rebates Create Incentives in Everyday Life

7) While there are intricacies specific to energy trading and the PJM market, the basic notions of what is in dispute are common to most of us in everyday life. We all “trade” when we buy or sell goods and services. In general, you can envision trades as consisting of three “buckets” of economic elements: the transaction costs of engaging in the trade ('Bucket 1'), the trade itself ('Bucket 2') and any credits or rebates related to the transaction ('Bucket 3').

8) Let me share a personal example that may help to further explain. If I purchase groceries at one local store, I receive a 5¢ per gallon credit to apply to gasoline purchases at a specific gas station for every \$50 of goods I purchased. Thus, I incur 'Bucket 1' costs in traveling to the grocery store, make 'Bucket 2' decisions about the relative cost of groceries and products at this store versus others, and evaluate the 'Bucket 3' potential rebates.

³ My understanding from both Powhatan and as characterized by Enforcement Staff in their Staff Paper is that all direct trading activity was conducted by Dr. Chen, with him conducting parallel trades for the Investor Funds. While some references in the report may be to both Dr. Chen and the Investor funds collectively, it is not intended to be contrary to this distinction of specific actions undertaken by Dr. Chen regarding actual submission of trades.

9) This type of “trading” can have unintended consequences. For example, this particular grocery store sold gift cards and initially these purchases counted toward accumulating the gasoline credit. Several years ago for the holidays, I bought all my nieces and nephews gift cards at the grocer. The transaction was sufficiently high so that I wound up obtaining enough gasoline rebates so that I could fill my tank up almost for free. Sadly, I discovered that the next month that gift cards were disallowed from the “crediting” program going forward. The store had wanted to create incentives to attract shoppers, but apparently had not considered the impact of the credit creating a motivation for greater purchases of items like gift cards when it created this program.⁴

10) In capturing a very large volume of credits, no one would suggest I engaged in fraud or manipulation. I just made rational economic decisions. Initially the store wanted me to spend more and I did. Later, because the store wanted to modify customer behavior in a more refined manner, it determined the credit should no longer be applied to gift cards. It changed the rules **prospectively**. Because of this, I modified my behavior in response to the new economic incentives and changed my purchases at the store. This story provides a lesson that should not be lost on the FERC.

UTC Background

11) PJM operates a security-constrained locational marginal price (LMP) energy market. Parties offer to purchase/sell real power or enter virtual buy/sell financial transactions into a day-ahead (DA) auction market. The market software selects the “best” solution in terms of offered supply and bid demand, while honoring the relevant security constraints of the underlying transmission system and operational limits of suppliers. In the process of solving this optimal power flow auction, separate LMPs are established at over 10,000

⁴ To put this in context, for the purchase of a \$100 gift card, I would receive \$2 in cash rebates for gasoline (on 20 gallons), \$100 of merchandise at a specific store (which I gave away as a gift), and approximately \$1-\$3 of value on “points” from my airline credit card. I also would receive any current coupons the store might be issuing that would apply to future purchases.

nodes, or locations, in the power grid. The LMPs reflect the marginal cost of supplying an increment of load at each location. LMPs may differ at each location on the electric grid due to transmission constraints. This difference is referred to as “congestion” between the nodes and also reflects the marginal value of transmission. The LMPs may also differ due to marginal transmission losses as well.

12) In real-time (RT) on the following day, parties are either paid or pay the difference between their DA purchases and their actual RT consumption in the market. For virtual transactions, there is no actual consumption and these transactions simply settle based upon the differences in LMP between DA and RT. The virtual traders “cover” the positions they took in the DA market, realizing either a profit or loss, as well as incurring a variety of PJM charges.

13) As originally contemplated by PJM, UTC transactions were intended to complement physical transactions. A UTC bid reflects the willingness of a participant to schedule a transaction between a source of power and a power sink (i.e. the location at which the power is consumed). The transaction will be scheduled so long as the congestion between the source and sink (calculated as the DA LMP at the sink minus the DA LMP at the source) is less than or equal to the UTC bid. The PJM market rules only allow bids in the limited range of differences between -\$50 per MWH and +50 per MWH, whereas it is conceivable that source-to-sink differences could be as high as several thousands of dollars per MWH. The PJM rules during the relevant time also required that either the source or sink in the transaction be an external node.

14) A UTC transaction has the same three types of economic 'Bucket' elements I detailed in my example above. 'Bucket 1' transaction costs include: i) transmission scheduling costs from PJM (typically at the non-firm rate of \$0.67 per MWH), ii) payment for PJM's ancillary services including reactive supply, voltage support and black start⁵, and iii) payment for a

⁵ Dr. Tabors estimated the sum of non-firm transmission and other charges as approximately \$0.92 per MWH. Tabors Affidavit at page 8.

portion of the administrative costs of operating the system (including scheduling and dispatch, IMM charge and other administrative charges).⁶ The 'Bucket 2' transaction itself would reflect changes between source and sink values, or congestion changes, specified in the UTC bid that occur in the DA and RT markets. Finally, there were 'Bucket 3' potential credits for adjustments to PJM overhead and also credits for MLSAs.

15) Over the years, volume and participation in the UTC market has fluctuated with changes to and controversy over the economic incentives of each of the three 'Buckets'. The Disputed Transactions are just an example of market participants responding to then-current incentives. As another example, since the period of interest described in the Preliminary Findings, the MSLAs have been eliminated for UTC transactions, but the charges for transmission service for these transactions have also been eliminated too. Net-net, this has created an incentive for market participants who had previously obtained their financial exposure from other bid mechanisms such as virtual Incremental (Inc) and Decremental (Dec) offers, to now obtain their financial exposure to the PJM markets via UTC transactions. This is because Inc and Dec transactions are being assessed Operating Reserve charges, whereas UTC transactions are not assessed this "Bucket 1" expense and as explained, also are excused from transmission costs. It is important to note that the PJM Independent Market Monitor addresses this increase in volume related to the relative incentives in his 2012 State of the Market Report, Volume 1, where he writes on page 36:

Following elimination of the requirement to procure transmission for up-to congestion transactions in 2010, the volume of transactions increased significantly. The average number of up-to congestion bids submitted in the Day-Ahead Market increased to 67,295 bids per day, with an average cleared volume of 920,307 MWh per day, in 2012, compared to an average of 29,665 bids per day, with an average cleared volume of 530,476 MWh per day, in 2011.

⁶ See Appendix B, page 3 of Written Submission to Commission Investigation Staff on Behalf of Dr. Houlian Chen (IN10-5)(December, 2010).

The sentiment is not new. The IMM actually expressed similar concerns regarding the relative costs of virtual transaction products prior to the period of interest for the Disputed Transactions.⁷ Thus, the impact of costs and credits (Buckets 1 and 3) has been a known factor regarding the relative incentives to undertake trades with respect to these transactions both before and after the period of interest.

The Introduction and Removal of TLCs Credited to UTC Transactions

16) In Docket EL08-14, initiated in December 2007, a group of virtual traders filed a complaint asking to receive a portion of the MLSA. Their argument was predicated on the fact that marginal losses were a component of the LMPs they paid. This complaint set in motion a process that would materially change the 'Bucket 3' incentives for UTC traders.

17) The addition of marginal losses in the LMP calculation was a material improvement in price signals and system dispatch. For instance, with the average loss calculation, a \$23 per MWH generator in Chicago might be dispatched to serve an increment of load in Philadelphia, instead of using a \$24 per MWH generator in Philadelphia (with no incremental losses), even if the use of the \$23 generator incurred \$4 of additional transmission losses.

18) The allocation of the over-collection of losses was a material financial issue. Basic physics dictate that marginal losses increase in proportion to the square of system load flows. Thus, paying marginal losses over time will result in the collection of significantly

⁷ See State of the Market Report, 2009, Vol. I, at page 40, available at http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2009/2009-som-pjm-volume1.pdf, where the Independent Market Monitor expresses concern that the lack of application of Operating Reserve Charges to UTC transactions creates a distortion in incentives versus other virtual transactions. Similar comments were made in the 2008 State of the Market Report at page 239, available at http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2008/2008-som-pjm-volume2.pdf and in the 2007 State of the Market Report at page 225, available at http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2007/2007-som-volume2.pdf. See also IMM testimony in ER10-2280 September 2, 2010.

more than the actual average losses realized.⁸ The MSLA reflects an allocation of the excess of the sum of the marginal payments collected above actual average losses incurred. This amount has been several billions of dollars over time.⁹ Not surprisingly, many market participants and related parties argued over who should receive the marginal loss surplus.

19) The Commission recognized the difficulty in properly allocating the over-collection of loss payments. In particular, they understood the basic concept that there was no 'right' place for these funds to be distributed. The Commission stated:

[T]he only fundamental principle to be applied is that the distribution should in no circumstance be based on the amount paid for transmission line losses, because that would distort the appropriate price signals which the use of marginal line loss pricing is designed to facilitate.¹⁰

20) I concurred. In fact, during the initial stakeholder discussions on MSLAs, my repeated recommendation was to apply the over-collected losses to the PJM overhead and literally give the rest away. This was the most incentive neutral allocation I could think of, and I believed that inevitably any other allocation based on system use would result in unanticipated and possibly undesirable incentives being created. My advice was ignored.

21) The Commission also had its concerns. It stated:

Paying excess loss charges (sic) to arbitrageurs also is inconsistent with the concept of arbitrage itself. The benefits of arbitrage are supposed to result from trading acumen in being able to spot divergences between markets. As stated above, arbitrageurs create their own load by the volume of their trades. If arbitrageurs can profit from the

⁸ See, for example, IMM State of the Market Report 2009, Vol. II, page 567, available at http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2009/2009-som-pjm-volume2.pdf.

⁹ For example the marginal loss over collection for 2009 was \$639.7 million or 50.8% of total marginal loss collection. *Id.* at page 88.

¹⁰ Black Oak II, 125 FERC ¶ 61,042 at P 37.

volume of their trades, they are not reacting only to perceived price differentials in LMP or congestion, and may make trades that would not be profitable based solely on price differentials alone.”¹¹

22) In other words, the Commission stated that adding credits to 'Bucket 3' would affect incentives for rational traders. It was clear to the Commission at that time that a rational trader would pursue trading opportunities where the aggregate of the three 'Buckets' was expected to be positive, and changing Bucket 3 would result in changed incentives to engage in any specific transactions receiving the MLSA. The Commission clearly understood the basic and transparent economic incentives of the MLSA that seem obscured to the Enforcement Staff, who now accuse Dr. Chen of market manipulation for doing exactly what the Commission predicted that he (or anyone else in that position) would do in reacting rationally to market incentives.

23) However, despite these explicit concerns and direct understandings, the Commission ultimately directed PJM to pay MLSA credits to all parties contributing to the fixed costs of the transmission system. It specified that UTC transactions **were included** in this allocation:

4. With respect to the allocation of the surplus, the Commission found any crediting mechanism that does not distort the pricing signals may be acceptable. But once PJM has chosen a methodology for crediting line loss over-collections, the Commission found that PJM must apply that methodology on a not unduly discriminatory basis. PJM based the credit on customers' access and transmission charges for using the network. The Commission concluded, however, that PJM's tariff was unjust and unreasonable and unreasonably discriminatory because it failed to pay the credit in certain circumstances in which customers paid transmission charges. The Commission

¹¹ Black Oak Energy, LLC v. PJM Interconnection, L.L.C., 122 FERC ¶ 61,208 at P 51 (2008).

directed PJM to revise its tariff to include a credit to others who pay for the fixed costs of the transmission system, including virtual traders.¹²

24) Similarly, during the Black Oak proceedings, the Commission further explained:

*10. PJM stated that it believes its proposed revisions satisfy the Commission's concern that collected marginal line losses be distributed equitably among all parties that support the fixed costs of the transmission system, without regard to whether such parties serve load. PJM stated that Network Service Users will still receive an allocation of surplus marginal line loss collections in proportion to their ratio shares of the total megawatt-hours of energy delivered to load in the PJM region, but that allocation now will also include "Transmission Customers," which includes load serving customers such as those taking point-to-point transmission service under Part II of the tariff. PJM explained that the allocation methodology for these customers is still based upon the Commission's accepted principle that allocation of marginal line losses to these customers is fair because it distributes the surplus back to load customers who pay for the fixed costs of the transmission system. PJM stated that it further modified section 5.5 to capture allocation of surplus marginal line losses to those customers engaging in **Up-To Congestion transactions in proportion to the total megawatt-hours of those cleared transactions** (that paid for transmission service during such hour). PJM averred that each customer identified in revised section 5.5 contributes, through transmission charges, to the overall costs of the transmission grid; therefore, through the proposed revisions, each will receive a distribution of the surplus over-collected marginal line loss charges.*

11. In the September 17, 2009 Compliance Order, the Commission found that PJM's proposed revisions comply with the directive to credit those who pay for the fixed or embedded costs of the transmission system. The Commission acknowledged, as did

¹² Black Oak Energy, LLC v. PJM Interconnection, L.L.C., Docket EL08-14, Order Denying Rehearing and Denying Motions, at P 4 (May 11, 2012)(footnotes omitted).

*PJM, that some virtual traders or arbitrageurs pay transmission access charges related to Up-To Congestion transactions, which contribute to the fixed costs of the transmission system and which should be included in the allocation process for disbursement of any surplus resulting from the over-collection of transmission line loss charges.*¹³

25) After the Disputed Transactions, PJM and the Commission realized that there was an undesirable feature now present in the PJM Tariff that should be changed. The change was straightforward - they removed the requirement for UTC traders to secure transmission, which also ended their eligibility to receive the MLSA.¹⁴

26) Since then, UTC transactions receive no MLSA, which reduced 'Bucket 3' credits, and they also do not pay for transmission which reduced 'Bucket 1' costs. But even now there is not a stable resolution of the costs in all the 'Buckets' -- an old dispute regarding whether or not UTC transactions should be assessed Operating Reserve (OR) charges has heated up again. For years, the PJM IMM has repeatedly taken the position that UTCs should not be excluded from payment of OR charges, as he believes that such charges should be applied to UTC transactions in a fashion that is similar to Inc and Dec virtual transactions. He takes this position because he believes the 'Bucket 1' charges for UTC are too low and discriminatory. As a result, he reasoned that this has created a distortion wherein UTC charges now have lower transactions costs. Thus he concludes that the UTC market is attracting more transactions than appropriate, resulting in higher OR charges to the remaining customers who still pay those costs.¹⁵

¹³ Black Oak Energy, LLC v. PJM Interconnection, L.L.C., Docket EL08-14, Order at PP 10-11 (July 21, 2011)(footnotes omitted, emphasis added). See also Black Oak Energy, LLC v. PJM Interconnection, L.L.C., Docket No. EL08-14-002, 128 FERC ¶61,262, at P 7 (Sep. 17, 2009) (footnotes omitted) (noting that the reference to PJM instituting a volumetric charge goes back to 2009).

¹⁴ Note that even this modification was not uncontested, with the IMM proposing a different solution based on modified MLSA credits for those purchasing non-firm transmission service.

¹⁵ See Docket ER13-1654, Comments of the Independent Market Monitor for PJM, at pages 4-5 (July 1, 2013):*Up-to congestion transactions have never been defined as “virtual transactions” in the tariff. There has been no general definition of “virtual transactions” in the tariff. Virtual transactions have been represented only as INCs and DEC. PJM’s filing redefines up-to congestion transactions as virtuals, and defines virtual transactions to also include INCs and DEC. The tariff provision assigning responsibility for operating reserves should have been*

27) A reasonable question at this point is “Who’s on first?”.¹⁶ Originally, the UTC transactions did not receive MLSA because of the Commission's stated concerns over creating incentives for traders to engage in whatever transaction received the MLSA (particularly noting volumetric payments). Then, the Commission overcame its concerns and directed PJM to pay the MLSA to UTC transactions based upon per MWH transmission payments. Shortly thereafter, PJM eliminated the underlying transmission service requirement for UTC transactions, thus ending the allocation. Based on other considerations, the Commission first directed PJM to pay MLSA to UTC transactions, then subsequently concluded that these credits should not have been made, and ordered them to be returned. Now, the IMM concludes that the net effect of all of this is to continue to distort trades and allocations.¹⁷ In other words, the IMM thinks that the UTC charges are still biased and create an inappropriate preference for UTC transactions over other virtual trades. Presumably, at any point, the IMM could file a complaint, and FERC could act to modify the OR allocation. This may be a reasonable conclusion, but any rational consideration would find that such an action should be prospective, and the FERC should

corrected to assign operating reserve charges to all virtual transactions. The result of the failure to do so is that up-to congestion transactions are not treated like other virtual transactions under PJM's proposed changes. There is no reason not to assign operating reserve charges to up-to congestion transactions in exactly the same way that operating reserve charges are assigned to INCs and DECs. The absence of such consistent treatment created, and will continue to create, a significant, arbitrary and uneconomic incentive to engage in up-to congestion transactions and an uneconomic incentive to shift away from INCs and DECs.

Until September 2010, the damage cause by the failure to assign operating reserve charges to up-to congestion transmissions like INCs and DECs was tempered by the requirement that up-to congestion transactions procure and pay for transmission service and the requirement that up-to congestion transactions source or sink at an interface. Neither requirement applies to INCs and DECs.

The requirement to pay for transmission was removed in September 2010. Prior to 2010, the tariff had required transmission reservations because the up-to congestion product was designed to facilitate imports, exports and wheel through transactions, all of which required transmission service.

Consistent with the theory that all transmission service customers should receive a share of the marginal loss surplus, the Commission required PJM to allocate a share of the marginal loss surplus to market participants who acquired transmission service for up-to congestion transactions. This unintentionally created an incentive to engage in up-to congestion transactions solely to obtain an allocation of the marginal loss surplus because PJM had over allocated marginal loss surplus to up-to congestion transactions such that the allocation of the surplus exceeded the actual congestion charge, an illogical allocation result.

¹⁶ This is a reference to a comedy routine made famous by Abbott and Costello where the two actors have a dialogue where each confuses the other.

¹⁷ The IMM's position does not go un-rebutted. It should be noted that PJM explains there should be no bucket 1 charges of BOR to UTC transactions because by definition, each UTC is balanced, with a matching injection and withdrawal.

not do so retroactively. De facto, in this proceeding, the FERC Enforcement staff is trying not only to implement such a conclusion retroactively, but punitively.

28) Without even considering the specific Disputed Transactions, reasonable questions might be: *With all of these rule changes, and the obvious resulting modifications in incentives related to the UTC transactions, what is the correct way to respond? Should all market participants try to guess for themselves what FERC, PJM, the IMM and the Enforcement Staff really want and intend to be the appropriate incentives? If they just follow the rules, will someone possibly knock on their door and inform them they have manipulated the market? Should they expect resettlements to be done retroactively?* Though seemingly rhetorical, this is a real and ongoing decision process for every market participant. This type of uncertainty and perceived fear can destroy a market.

The Disputed Transactions

29) When evaluating the Disputed Transactions, it may be helpful to keep in mind the history of shifting economic incentives described above, the resulting trader behavior and the need for market participants to understand the rules.

30) The Staff Paper, as well as previous submissions by Dr. Tabors and Dr. Pirrong, discusses the Disputed Transactions.¹⁸ In this short discussion, my comments focus more on “matched” UTC trades¹⁹ that Enforcement describes as “wash trades” that constituted market manipulation.

31) These matched UTC trades consisted of two UTC transactions, **both offered at a positive price.** In the abstract, these could be characterized by a UTC submission from

¹⁸ See Affidavit of Dr. Richard Tabors, Docket IN10-5, October 21, 2011; Affidavit of Dr. Craig Pirrong, Docket IN10-5, December 13, 2010.

¹⁹ I use the term matched trades for the situation where two UTC transactions were submitted that had exactly opposite source and sinks **but the same positive bid price.** As I explain, these are not wash transactions. See following paragraphs.

source A to sink B, and a second submission from source B to sink A.²⁰ In most of the transactions, the external interface was MISO, while the internal node varied. Because of the A-B, B-A nature of these UTC transactions, **only** when both submitted trades cleared in the market place was the resulting congestion risk reduced to zero and the economics of the trade were determined by the PJM charges in 'Bucket 1' and the PJM credits in 'Bucket 3'.

32) In this situation, Staff moves somewhat disingenuously from noting that since 'Bucket 2' had no impact on aggregate profitability of the trade, then the associated trades were wash transactions.²¹ To reach this conclusion, Staff ignores the economic substance and risk of 'Buckets' 1 and 3 and the risk of 'Bucket 2'. This is plainly irrational. Bucket 1 and 3 charges were “real”, known to exist, and potentially highly variable.

33) In fact, though clearly wrong, Enforcement Staff basically describes the entire process as a “scheme” to “target” MLSAs because of wash trading.²² When decomposed and evaluated with critical thinking, the Staff argument simply doesn't hold water.

34) Staff is actually wrong with respect to virtually all of its findings. Dr. Chen and the Investor Funds undertook these matched trades that were sought to be of low risk with respect to 'Bucket 2', yet they still had material risk within each of the three components. They were typically, but not always, profitable. They also undertook these trades in an open and transparent manner, consistent with Commission and PJM rules, and in response to a Commission-directed incentive. In these circumstances, there is neither wash trading nor a fraud perpetrated on the market.

²⁰ Staff acknowledges that initial matched trades were done in a format characterized as A-B, C-A, where B and C were deemed by Dr. Chen to be electrically “close”.

²¹ This is no more descriptive than noting I bought \$100 gift cards worth \$100 of merchandise in my earlier example. That segment of my transaction was a “wash”, but it ignores Buckets 1 and 3, material elements of my economic decision-making.

²² Indeed, the actual characterization of wash trading seems a misnomer here, as presumably a wash trade would be without economic value, risk, or profit.

35) The Commission itself previously and openly acknowledged that such a credit would create just these types of incentives and related transactions. That is, Dr. Chen responded in exactly the way the Commission anticipated a rational participant would when presented with these incentives. Simply put, the Commission was concerned that its determination might create specific incentives, and indeed people responded just as anticipated to the Commission approved incentives. It is difficult to discern what is problematic about responses that were fully anticipated, evaluated and approved by the Commission.

Risk / Return in Each of the 'Buckets'

36) As discussed above, a reasoned understanding of the Disputed Transactions should incorporate the economic incentives collectively of each of the three 'Buckets' as well as their collective impact. As long as open and transparent bids are predicated on the combined incentives, there should be no basis for any conclusion of manipulation. All three 'Buckets' provided economically relevant incentives as each contributed to risk and return of the overall transaction. Rational behavior would sum the total incentives, and react accordingly.

Risk in Bucket 2

37) As the Preliminary Findings highlight, 'Buckets' 1 and 3 did not always result in a net benefit for Dr. Chen or the Investor Funds. This makes sense, since it was not predetermined that 'Buckets' 1 and 3 had to net to a positive amount.

38) Further, Staff ignores the fact that during the infrequent occurrence when one of the two legs of a Disputed Transactions was not accepted, it represented a potential opportunity for someone holding that position to profit from the atypical result. In such a high deviation event, it is expected that that position would be profitable as it is reasonable to assume that the RT spread between the source and sink LMPs would narrow relative to the DA due to the direct incentives such a spread would present to other market participants (e.g. to add imports or increase internal resources). Indeed a fundamental

market design objective was to create incentives for price convergence between the DA and RT market, and discourage atypical divergence.

39) It should be very easy to understand why 'Bucket' 2 may not be zero. Since UTC bids are restricted to the limited range between -\$50 to +\$50 per MWH, it does not cover all possible outcomes of DA congestion. For instance, DA prices can range as high as \$1,800 per MWH. Also, negative values are possible. Staff erroneously dismisses any consideration of these realities.

40) Negative numbers are always less than positive numbers. Since Dr. Chen always bid with positive congestion caps on both legs of the transactions he submitted, if one leg were to be rejected because congestion was too high, the other leg would have to be accepted. This is because the spread between A and B is equal and opposite to the spread from B to A. This means that if the congestion in one direction is \$40, on the other leg, it is *negative* \$40. Dr. Tabors previously explained the basic arithmetic of the UTC bidding process and why if one leg failed to clear, the other must clear, along with the associated exposure to the difference between DA and RT congestion.²³

41) Also, Dr. Chen didn't always bid the maximum congestion cap of \$50. Rather, as both Dr. Tabors and Staff noted, a material amount of the offers were below the allowed bid range.²⁴ The Staff ignores the obvious significance of this.

42) This fact is important because it highlights that Dr. Chen intentionally (and rationally) submitted bids with congestion caps that increased the likelihood that one leg would be rejected. There is at least one explanation of this behavior that again flies in the face of Staff's incorrect characterization of these paired UTC bids as wash trades and manipulative: If the DA congestion was unusually large, the resulting exposure of having one leg rejected and the other accepted would reasonably have been expected to have a

²³ See Tabors Affidavit appendix for graphical example.

²⁴ See Staff Paper at page 23; Tabors Affidavit at page 20, referencing Dr. Chen. I have not independently vetted this analysis.

positive value. This goes back to the basic incentives for other market participants to attempt to arbitrage the congestion between the two locations. Dr. Tabors suggests that this is the so called "home run" situation.²⁵ Dr. Pirrong uses a less exciting description, but makes the same observation, and notes that this is not an atypical or inappropriate trading activity.²⁶

43) Despite the choice of name one gives this occurrence, it is important to note that it is based upon market fundamentals. The market is specifically designed to create incentives to alleviate congestion. If there is significant congestion in the DA LMPs, there are many participants in both the PJM and MISO markets who may respond to such market conditions. For instance, they may schedule more imports, or commit more units in PJM. Each action would be expected to raise supply in congested areas and lower the spread position incurred by the UTC transaction. In general, it would appear that if Dr. Chen waited to see if a wide spread occurred in the DA market, it would be a reasonable trade to see if the spread converged according to the underlying market incentives. But, as markets are volatile and uncertain; it would be possible that the RT congestion could exceed the DA congestion and the counter flow spread position could lose money. Thus while making a reasonable trade, and hopefully profitable, the positions taken by Dr. Chen were exposed to inherent risk.

44) Even if Dr. Chen had always submitted his bids at \$50, he would still have had exposure to this risk. But, the fact that he intentionally increased the exposure to this risk is noteworthy and relevant.

45) For some unexplained reason, Staff completely dismisses, or fails to understand, this logic. By providing the MLSA credit to 'Bucket 3', the Commission simply made it less costly, and even profitable, for Dr. Chen to "tread water" and wait for such low probability events to occur. It is hard to criticize someone for taking a potentially profitable trading

²⁵ See, e.g., Tabors Affidavit at page 12.

²⁶ See Pirrong Affidavit at ¶¶ 30-32.

position while waiting for an opportunity for even larger returns. It seems even harder to criticize them if the market rewards them for taking such risks. As a matter of fact, we should all seek such opportunities and the FERC should encourage this behavior when the rules direct such behavior. And, of course, the FERC understood just the sort of incentives they were creating when they created them, although now the Staff pretends not to understand.

Risk in 'Bucket 3'

46) Even if it was guaranteed that both of Dr. Chen's paired legs would have always been accepted, he was still exposed to risk, again eliminating the notion of wash trading. Staff dismisses this entire issue.²⁷ But such a dismissal is incorrect. Staff should consider three critical facts. First, the exact value of the TLC was unknown at the time the UTC bids are submitted. Second, TLC values are volatile. Thirdly, Staff itself cites statistics showing that paired cleared trades did sometimes lose money.

47) The Staff fully understands that the MLSA payments were not knowable at the time that Dr. Chen submitted his bids. In its Preliminary Findings on page 15, it cites Kevin Gates where he described that the MLSA payments were not posted until "about a week after the fact." If things are not known at the time when acted upon, that introduces risk.

48) The desire to attempt to predict the TLC in maximizing the expected returns on a trade is just as appropriate of an objective as trying to predict where congestion might occur. And, analyzing historical data can be a tool that could assist either goal. Enforcement Staff seems critical of Dr. Chen²⁸ for having tried, possibly successfully, to estimate when he would most likely receive the largest 'Bucket 3' TLC payments. This is remarkable because this rational response was fully anticipated by the Commission, and implemented at the Commission's direction and approval. Why should anyone be criticized for trying to

²⁷ See Staff Paper at page 24.

²⁸ See Staff Paper at 8.

estimate when market fundamentals would result in higher credits or returns for legitimate trades?

49) At this point, it should be obvious that the TLC values were volatile. Commenting on the TLC values between May 29 and August 19, 2010, Dr. Tabors explained:

During this period, average daily per-MW TLC allocations ranged from approximately \$0.70 up to \$2.10. For the period of May 29 through August 19, 2010, the average TLC allocation was \$1.25 with a standard deviation of \$0.32.²⁹

Similarly, Dr. Pirrong stated:

For instance, in June, 2010, the TLC payments averaged \$.56, but had a standard deviation of \$.09; in July, 2010, they averaged \$.66 with a standard deviation of \$.16, and in August, 2010 they averaged \$.60 with a standard deviation of \$.20. The positive standard deviations indicate that the transactions that Mr. Chen undertook were risky. Since these payments were risky, transactions that generated such payments cannot be considered as wash trades per se because wash trades involve simultaneous purchase and sale with no risk of loss.³⁰

Thus it is obvious that risk and uncertainty existed with respect to Bucket 3 credits, and that Dr. Chen appropriately sought to capture value related to this uncertainty in his trading. Again, such actions are antithetical to the notion of wash trading or manipulation. They are directly indicative of competitive behavior consistent with the incumbent rules and regulations.

²⁹ Tabors Affidavit at page 6.

³⁰ Pirrong Affidavit at ¶ 47.

Volatility Introduces Risk.

50) The Staff Paper is internally inconsistent and conflicted. On the one hand, it (erroneously) concludes that the Disputed Transactions are 'wash trades' that were not exposed to risk. On the other hand, it explicitly states (page 23, paragraph two) that even when both legs of Dr. Chen's matched trades cleared, they failed to make a profit almost 20% of the time. Staff can't have it both ways. And, only one of these statements can be empirically proven. As directly acknowledged by Staff and discussed above, there was no systematic or structural "wash trades". Indeed, the assumption of risk across all three Buckets entailed risk, but admittedly, resulted in trading profits consistent with the incentives presented.

51) Perhaps in recognition of this material impairment to their argument, Staff "points the finger" at Dr. Chen. The problem that Staff will encounter with this approach is that FERC has left a detailed documentation trail of guidance and direction that makes it clear that Dr. Chen was simply following Commission-directed rules and anticipated incentives. Staff cannot credibly argue that a Commission-approved payment that was defined by PJM to be based on MWH use **was not** intended to be volumetric and, if expected to be positive, a volumetric incentive.

52) Staff's logic takes the notion of the market participant as a market fiduciary to an untenable extreme. Staff is essentially arguing that even if the Commission didn't understand the incentives it was creating (which it obviously did), market participants should have figured out what the Commission or the Staff really wanted to happen, and ignored the explicit direction the Commission gave PJM with respect to specifying that UTC transactions were to receive MLSA. If participants were to have acted this way, presumably Staff expected the market participants to then reject some or all of the TLC payments, in order to comply with Enforcement Staff's ex post determinations of what is appropriate. None of this makes any sense whatsoever.

53) It's also noteworthy that Enforcement Staff's position is strained to say the least. If "*it nowhere suggest[s] it would be proper to pay MLSA to those who collected based on the volume of trades*"³¹, what was a party who purchased non-firm transmission expected to do if they received MLSA payments based on the volume of their transactions? Were market participants supposed to totally ignore the payments? Were they supposed to try to read the Staff's mind, calculate their own "fair" share of reimbursement and return some of the money to PJM if they felt that they received an amount inconsistent with what Staff would (ex post) have wanted? These notions are ridiculous to say the least.

54) The FERC needs to assume responsibility for the incentives it creates, and potential associated consequences it may not find desirable. If it is not happy with respect to the way the market participants respond to the incentives it creates, FERC needs to change those incentives, obviously in a prospective fashion. Pushing this responsibility onto the participants will lead to a demise of the market systems as any rational participant will refuse to participate and will exit the system.

There Was Even Risk in 'Bucket 1'

55) While it has not received much attention to date, there are also risks associated with the 'Bucket 1' charges. PJM overhead charges, voltage support aid and black start are not fixed and do vary. Unknown expenses introduce risk to any transaction.

56) PJM's FERC-appointed Independent Market Monitor has been vocal and clear regarding his thoughts that UTC transactions should pay Operating Reserve charges. These also add risk to Bucket 1 charges. Several excerpts from the Independent Market Monitor position in front of the Commission demonstrate this potential: ³²

³¹ Staff Paper at 27.

³² See Docket No. ER13-1654-000, Comments of the Independent Market Monitor for PJM, at pages 2, 5 (July 1, 2013).

Accordingly, PJM should be required to submit an additional filing that explicitly assigns operating reserves charges to up to congestion transactions consistent with other virtual transactions.

There is no reason not to assign operating reserve charges to up-to congestion transactions in exactly the same way that operating reserve charges are assigned to INCs and DECs. The absence of such consistent treatment created, and will continue to create, a significant, arbitrary and uneconomic incentive to engage in up-to congestion transactions and an uneconomic incentive to shift away from INCs and DECs.

These charges can be material. For example, on September 11, 2013, the deviations based balancing operating reserve charge was \$15.94 per MWH.³³

Another perceived, or even possible, risk is the potential for PJM to attempt to retroactively apply Operating Reserve charges to UTC transactions. Given the tortured history with respect to the MLSA allocation to UTC traders, and the attempt to retroactively recall the retroactively returned refunds, this is certainly a perceived risk by many participants in the market and may, in fact, be a material risk. At this point, market participants have no ability to predict what rules FERC may try to impose or subsequently alter, with a retroactive effective date, after months of vacillating decisions.

Conclusion

57) I believe all the comments above point to a much more reasoned explanation of the Disputed Transactions. Dr. Chen simply adjusted his bidding strategy in direct response to a Commission-approved, and directed, credit. Each of the three 'Buckets' of these transactions introduced risk to his trades. Dr. Chen chose open, transparent and legitimate trades that, among other considerations, took the MLSA into account. Dr. Chen also legitimately tried to maximize his expected earnings by conducting analyses intended to understand when such credits might be largest and apparently increasing his trading volumes when such conditions seemed most favorable. This is all rational and expected

³³ <http://www.pjm.com/markets-and-operations/market-settlements/preliminary-billing-reports/ops-rates.aspx>

market behavior. It certainly doesn't represent fraud or manipulation. Rather, it is or should be the expected behavior associated with competitive responses to incentives presented by regulators to market participants.