

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

**PJM Interconnection, L.L.C.**

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**Docket No. ER14-504-000**

**MOTION FOR LEAVE TO ANSWER AND  
ANSWER OF THE PJM POWER PROVIDERS GROUP**

Pursuant to Rules 212 and 213 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission (the “Commission” or “FERC”),<sup>1</sup> the PJM Power Providers Group (“P3”)<sup>2</sup> respectfully moves for leave to answer<sup>3</sup> and answers in opposition to the Protest of the Joint Consumer Advocates and Public Interest Organizations<sup>4</sup> (“Joint Consumer Advocates Protest”), Protest of Old Dominion Electric Cooperative (“ODEC Protest”)<sup>5</sup> and the

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<sup>1</sup>18 C.F.R. §§ 385.212, 385.213 (2014).

<sup>2</sup> P3 is a non-profit organization dedicated to advancing federal, state and regional policies that promote properly designed and well-functioning electricity markets in the PJM Interconnection, L.L.C. (“PJM”) region. Combined, P3 members own over 87,000 MW of generation assets and over 51,000 miles of electric transmission lines in the PJM region, serve nearly 12.2 million customers, and employ over 55,000 people in the PJM region, representing 13 states and the District of Columbia. The comments contained in this filing represent the position of P3 as an organization, but not necessarily the views of any particular member with respect to any issue. For more information on P3, visit [www.p3powergroup.com](http://www.p3powergroup.com).

<sup>3</sup> Although the Commission’s procedural rules do not provide for answers to protests as a matter of right, the Commission regularly allows answers where, as here, the answer provides further explanation or otherwise helps ensure a full and complete record. See, e.g., *PJM Interconnection, L.L.C.*, 104 FERC ¶ 61,154, at P 14 (2003), *on reh’g*, 109 FERC ¶ 61,236 (2004); *Williams Energy Mktg. & Trading Co. v. Southern Co. Servs., Inc.*, 104 FERC ¶ 61,141, at P 10 (2003); *Ameren Servs. Co.*, 100 FERC ¶ 61,135, at P 15 (2002), *on reh’g*, 103 FERC ¶ 61,178 (2003).

<sup>4</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Protest of the Joint Consumer Advocates and Public Interest Organizations (filed December 20, 2013).

<sup>5</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Protest and Request for Rejection or, in the Alternative, Maximum Suspension Period and Hearing and Settlement Judge Procedures of Old Dominion Electric Cooperative. (filed December 20, 2013).

Protest of the Coalition of Diverse Stakeholders (“Protest Coalition Diverse Stakeholders”)<sup>6</sup> with regard to the PJM Interconnection, L.L.C. (“PJM”) November 29, 2013, Section 205 filing<sup>7</sup> (“PJM November 29 Filing”) in the above-captioned proceeding.<sup>8</sup>

## ANSWER

### I. PJM Has Met Its Burden Under Section 205 of the Federal Power Act

Contrary to assertion of some parties in this docket, PJM’s only burden in this proceeding is to prove that its proposal is just and reasonable. Section 205 of the Federal Power Act (“FPA”) requires PJM to show that its proposal is just and reasonable; it does not require PJM to show that its proposal is superior to all other alternatives. As Section 205 states: “All rates and charges made, demanded or received by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission, and all rules and regulations affecting or pertaining to such rates or charges shall be just and reasonable, and any such rate or charge that is not just and reasonable is hereby declared unlawful.”<sup>9</sup> Even the

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<sup>6</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Protest of the Coalition of Diverse Stakeholders (filed December 20, 2013) (“Protest Coalition of Diverse Stakeholders”).

<sup>7</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000 (filed November 29, 2013).

<sup>8</sup> P3 does not attempt in this answer to address all of the comments and protests opposing or supporting the PJM November 29 Filing, but is instead focusing on certain key points. P3’s silence with respect to other comments, assertions and arguments made by commenters and protestors opposing or in support of the PJM November 29 Filing should not be construed as meaning that P3 agrees or disagrees with such assertions and arguments.

<sup>9</sup> Section 205 of the Federal Power Act (FPA) 16 U.S.C. § 824d (2006) *See also California Independent System Operator, Corp.*, 140 FERC ¶ 61,168, at P 17 (2012) (“ [t]he courts and this Commission have recognized that there is not a single just and reasonable rate. Instead, we evaluate [proposals under Section 205] to determine whether they fall into a zone of reasonableness. So long as the end result is just and reasonable, the [proposal] will satisfy the statutory standard.”) (citations omitted); *Calpine Corp. v. California Independent System Operator Corp.*, 128 FERC ¶ 61,271, at P 41 (2009) (citations omitted); *New England Power Co.*, 52 FERC ¶ 61,090, at 61,336 (1990), *aff’d*, *Town of Norwood v. FERC*, 962 F.2d 20 (D.C.Cir. 1992) (rate design proposed need not be perfect, it merely needs to be just and reasonable) (citing *Cities of Bethany, et al. v. FERC*, 727 F.2d 1131, 1136 (D.C.Cir. 1984) (utility needs to establish that its proposed rate design is reasonable, not that it is superior to all alternatives)).

ODEC Protest acknowledges that “PJM need only demonstrate that its proposal is just and reasonable, not that it is superior to all other alternatives.”<sup>10</sup>

Moreover, the Commission has previously found that a RTO/ISO has the exclusive authority to maintain reliability in its region.<sup>11</sup> Specifically, the Commission affirmed PJM’s responsibility to maintain reliability in its footprint.<sup>12</sup> Consistent with these findings, the Commission should continue to preserve PJM’s section 205 rights to propose tariff changes that will maintain reliability within its region provided those changes are just and reasonable.

PJM has proven that its proposed changes are a just and reasonable way of addressing a mistake that was made in 2011. As P3 noted in its initial Comments, PJM’s proposal underwent a robust six month stakeholder process that included a full vetting of the issues and the consideration of numerous proposals, counter-proposals and edits.<sup>13</sup> Outside experts delved deeply into the many issues associated with the current market structure and ultimately PJM

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<sup>10</sup> ODEC Protest, p. 7, citing *See Gulf S. Pipeline Co., LP*, 144 FERC ¶ 61,095 at P 32 (2013) “Gulf South is not obligated to demonstrate that all service options under its new proposal are equal or superior to the *status quo*. Rather, it merely must show its proposal to be just and reasonable”, citing *Tennessee Pipeline*, 128 FERC ¶ 61,032 at P 49; *American Elec. Power Serv. Corp.*, 116 FERC ¶ 61,179, at P 25 (2006); *Southwest Power Pool, Inc.*, 137 FERC ¶ 61,075, at P 79 (2011) (“the issue before the Commission is whether the proposal is just and reasonable and not whether the proposal is more or less reasonable than other alternatives.”).

<sup>11</sup> *Regional Transmission Organizations*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089, at pp. 315, 321, 329 (1999) (finding that the RTO has exclusive authority over short-term reliability and “the RTO must perform its functions consistent with established NERC (or its successor) reliability standards, and notify the Commission immediately if implementation of these or any other externally established reliability standards will prevent it from meeting its obligation to provide reliable, non-discriminatory transmission service.”), *order on reh’g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000), *aff’d sub nom. Pub. Util. Dist. No. 1 of Snohomish County, Washington v. FERC*, 272 F.3d 607 (D.C. Cir. 2001).

<sup>12</sup> *PJM Interconnection, L.L.C.*, 96 FERC ¶ 61,061 at 61,229 (2001) (in finding that PJM qualified to be a Regional Transmission Operator (RTO), the Commission stated that an RTO “must have exclusive authority for maintaining the short term reliability of the grid that it operates” and “the PJM Board must have the exclusive authority to propose changes to these reliability requirements under section 205 of the FPA.”); *PJM Interconnection, L.L.C.*, 109 FERC ¶ 61,094, at P 30 (2004) (finding that “PJM is responsible for the reliability of the entire PJM footprint”)

<sup>13</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Comments of the PJM Power Providers (filed December 20, 2013). (“P3 Comments”) at pp.8-9.

concluded that its proposal was the most reasonable solution to improve, while not completely fixing, the problems associated with inferior demand response products in the PJM market.

While a few other parties offered criticisms and advocated alternatives, none of the comments rise to the level of rendering the PJM proposal unjust and unreasonable.

## **II. The Status Quo Can Not Continue**

Despite claims made by the Coalition of Diverse Stakeholders,<sup>14</sup> doing nothing and maintaining the status quo simply cannot continue. The Coalition of Diverse Stakeholders claims that the status quo is working and accommodating generation retirements noting that almost 70% of all new generation that has offered into the RPM auctions has cleared since the PJM “misstep”.<sup>15</sup> However, the Coalition of Diverse Stakeholders and others fail to acknowledge several important facts. The problems with the current situation are well documented. As P3 explained in its comments, the current rules present several problems. The current rules:

- lead to an over-procurement of Limited Demand Resources (“Limited DR”) and Extended Summer Demand Resources (“Extended Summer DR”), which are indisputably inferior from a reliability point of view, at the expense of more reliable annual resources, both generation and annual demand response.;
- create an effective vertical demand curve for annual resources, thereby negating the benefits of a sloped demand curve;

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<sup>14</sup> Protest Coalition of Diverse Stakeholders, pp. 1-2.

<sup>15</sup> Protest Coalition of Diverse Stakeholders, pp. 1-2.

- suppress prices for more valuable capacity resources such as annual DR and generation. The incorrect modeling of Limited and Extended Summer DR and the resulting mis-pricing of those resources has displaced and under-compensated annual products with greater reliability value and likely hastened the retirement of existing units capable of providing significantly greater reliability that should not have retired. This price suppression has also likely discouraged investments in new generation and new demand response technologies, leaving PJM with portfolio of resources that is less flexible in meeting capacity needs.<sup>16</sup>

Also while the current market rules have led to an unjust and unreasonable suppression of capacity prices, these same rules likely provoked higher energy prices than would have been seen had the capacity market rules been structured properly. As P3 noted it in its initial comments, despite being able to offer capacity at relatively low prices, demand response enjoys a much higher offer cap than installed generation in PJM's energy markets and is not subject to the same bid mitigation rules. Indeed, demand response can make unmitigated offers to the market at a price up to \$1800<sup>17</sup> and most Limited DR is priced at this level. As the level of demand response in PJM's market increases, the likelihood that these resources get called and set the clearing price increases. Because of this displacement of capacity resources with lower energy market costs, and overall reduced volatility from returning the demand curve to its proper

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<sup>16</sup> P3 Comments at pp3-8.

<sup>17</sup> Note that PJM has proposed to lower this cap as part of its DR operational flexibility filing. *PJM Interconnection, L.L.C.*, Docket No. ER14-822-000 (filed December 24, 2013). However, the proposed caps are still higher than the \$1000/MWHR maximum offer cap in place for generation resources.

representation, PJM estimates the energy market savings that could result from approval of this filing could rise to \$3.4 billion depending on the surplus of resources.<sup>18</sup>

Furthermore, the long term damage of maintaining the status quo significantly pales in comparison to any short term effect. While RPM has generally worked well, this “mis-step” has contributed to an under procurement of annual capacity products and a suppression of prices. In accommodating an inferior product PJM has already accepted lowered reliability standards (which will improve but remain under the proposed fix). As Dr. David Hunger and Dr. Shanker explain clearing only the lower quality DR products (typically Limited DR) against the sloped portion of the demand curve creates a vertical demand curve for the annual, more valuable capacity resources, and fails both to recognize properly the marginal value of annual resources and to provide an appropriate long term price signal for new and existing capacity resources.<sup>19</sup> PJM has accepted degradation below the “1 in 10” standard to accommodate these limited products. Capping these products lessens the damage caused by their existence.

The state commissions of North Carolina, Ohio and Pennsylvania acknowledge that, although the price of capacity may increase in the short term as a result of the proposed tariff provisions, the revisions will result in stable pricing over time and improve reliability in the long-term. The Ohio Commission specifically argued for additional action from the Commission beyond the proposed revisions to account for the inferior nature of limited demand resource

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<sup>18</sup> P3 Comments pp. 7-8.

<sup>19</sup> Reply Affidavit of Roy J. Shanker Ph.D. ¶ 23 (“Shanker Reply Affidavit”); *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Comments and Limited Protest of the Indicated PJM Utility Coalition, (filed December 20, 2013) (the “PJM Utility Coalition Comments and Protest”), Declaration of Dr. David Hunger (“Hunger Declaration”) at ¶¶ 16-17 .

products.<sup>20</sup> In general, all three state commissions agree that the threat to reliability is not theoretical. As described by Shanker, “[i]t is indisputable, however, that this price suppression will prevent RPM from encouraging needed entry as needed and discouraging premature retirement of Annual Resources. This will result, in the long term, in precisely the sort of displacement of superior Annual Resources by inferior limited products that Mr. Wilson concedes will degrade reliability.”<sup>21</sup> Fortunately, the proposal fixes the mistake before permanent market damage or failure occurs.

### III. PJM Appropriately Models the 2.5% Holdback in its Proposal

As an initial matter, P3 agrees with the PJM Independent Market Monitor (“IMM”) and the PJM Utilities Coalition that the short term resource procurement target (“STRPT”) or holdback should be eliminated. There is little doubt that this unique-to-PJM systematic under procurement of capacity coupled with must offer obligations for suppliers suppresses prices for capacity and interferes with proper market signals.<sup>22</sup> However, assuming that the holdback will not be eliminated prior to the 2014 BRA, the question becomes how to best manage this market disrupting rule in the short term.

As explained by Dr. Shanker in his initial affidavit and in his attached reply affidavit, PJM’s proposed means of dealing with the 2.5% holdback as it relates to the caps on limited and extended summer demand response is sound market policy. Applying the holdback in a different manner would merely compound the reliability shortfalls inherent in PJM’s market as a

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<sup>20</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Comments Submitted on Behalf of the Public Utilities Commission of Ohio (filed December 20, 2013) (“PUCO Comments”), p. 5-9.

<sup>21</sup> Shanker Reply Affidavit, at ¶ 40 (citing Wilson Affidavit, at ¶ 50).

<sup>22</sup> According to the comments submitted by the PJM IMM, prices in last BRA were skewed 27% by the holdback. *PJM Interconnection, L.L.C.*, Docket No. ER14-504-000, Comments of the Independent Market Monitor for PJM (filed December 20, 2013) (“IMM Comments”), at p.4 and n.10.

result of the existence of the holdback. As Dr. Shanker articulates, “the model must solve for an overall procurement under which all of the STRPT comes from the inferior products in order to prevent further reliability degradation (having already allowed degradation to significantly less than “1 in 10” LOLE).”<sup>23</sup>

It is an unavoidable fact that, all other things being equal, accepting the “holdback compromise” proposed by the Joint Consumer Advocates, ODEC and the Diverse Stakeholders means accepting the potential for a degradation of reliability in PJM even further below the 1 in 10 standard.<sup>24</sup> PJM, by modeling the holdback in the manner it proposes, is assuming that inferior demand response products enter the market in incremental auctions ahead of the superior annual products – which is certainly a logical assumption given the lower price corresponding to the inferior nature of these products. It would be imprudent to assume otherwise regardless of recent empirical experience.

That said, Dr. David Hunger succinctly offers the most logical course for PJM to pursue, “Given PJM’s experience, the most appropriate remedy would be to eliminate the 2.5% holdback altogether.”<sup>25</sup> P3 agrees. However, for purposes of the instant filing the perfect should not be the enemy of the good. The modeling of the 2.5% holdback in the limited resource constraint proposed by PJM is a just and reasonable means of managing this rule until it is transitioned out of the market.

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<sup>23</sup> Shanker Reply Affidavit at ¶32.

<sup>24</sup> Shanker Reply Affidavit at ¶33.

<sup>25</sup>Hunger Declaration at ¶ 32



**IV. The value of Limited DR and Extended Summer DR as Excess Capacity Resources is Severely Overstated by Some Parties and Does Not Account for the Other Damage to the Market that Would Occur if the Status Quo Were Maintained**

As P3 has stated on numerous occasions, the existence of limited demand response products in the market in PJM is problematic and PJM should transition to a single annual demand response product with commitments to the market that mirror those of generation. The inferior nature of limited DR products has been well established by other parties to this proceeding, and P3 joins the IMM and the PJM Utilities Coalition in the call for elimination of these products from the market.<sup>26</sup> As Dr. Bowring stated, “Even in restricted quantity, limited DR is an inferior product which suppresses capacity market prices and directly displaces generating units and Annual DR. Reliability will continue to fall short of PJM’s estimate of what is needed to meet applicable industry standards.”<sup>27</sup>

As discussed briefly above, the Public Utilities Commission of Ohio acknowledges that the limited demand resource products are inferior and argues that the prices paid to the demand resource products should be shifted downward to reflect the inferior nature of the products in the compensation received. Although this unique proposal by the Public Utilities Commission of Ohio acknowledges the inferior value of the limited demand resources, we reiterate our position that PJM should shift to a single, annual product (which does not preclude demand resources from participating in the market as annual resources).

Claims that inferior demand response products have value beyond the reliability requirement are overstated at best. First, “the mere presence of inferior demand response

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<sup>26</sup> IMM Comments, pp1-2; PJM Utility Coalition Comments and Protest at p 2.

<sup>27</sup> IMM Comments at pp.3-4.

products in the market results in a reliability degradation unless the IRM is adjusted upwards to reflect reliance on inferior products, or there is by chance a sufficient surplus collectively.”<sup>28</sup> Second, any inferior demand response procured after the reliability requirement would displace an annual capacity product which by definition provides superior reliability (or prevents further degradation of reliability).<sup>29</sup> Finally, the price suppression problems associated with inferior demand response products are compounded if limited DR enters the market above the IRM and leads to a market over time where, depressed prices wind up eliminating new entry or encourage retirement of annual products.<sup>30</sup>

The Coalition of Diverse Stakeholders offers that, “Once the Reliability Requirement is met, excess capacity should be procured based on price competition.”<sup>31</sup> P3 would agree if the competition were among equal resources, but the fact is inferior limited demand response is not a comparable product to annual demand response or generation. As P3 noted in its initial comments, annual resources must be available approximately 8,300 hours a year as compared to some limited demand response resource that are only required to be available as few as 60 hours, yet many parties cling to the failed assumption that these resources are providing the same value to the grid. Common sense combined with numbers provided by PJM, the IMM and P3 suggest otherwise.

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<sup>28</sup> Shanker Reply Affidavit at ¶P. 54.

<sup>29</sup> Shanker Reply Affidavit at ¶P. 39. Mr. James Wilson agrees to the lesser value ascribed to limited DR when he offers “at some level of clearing of excess LimRS it might be necessary to acquire 125 MW of incremental LimRS to realize the equivalent of 100 MW of a higher availability resource.” Wilson at ¶56.

<sup>30</sup> Shanker Reply Affidavit at ¶40.

<sup>31</sup> Protest Coalition of Diverse Stakeholders, p.9.

Moreover, as Dr. Shanker articulates, to the extent inferior demand response resources have any incremental value, no matter how small, after the reliability requirement is met that value is due to the fact that these inferior resources can “lean” on the superior, annual products that have been procured. As Dr. Shanker states, “The only reason that the inferior product can bid in the first place is because of the disproportionate reliability contribution being made by the Annual Resources. In effect, those Annual Resources create an option for some acceptance of the inferior product. Without that option, PJM could not accept any of the inferior products and still meet even its reduced reliability target. . . .What PJM has done is effectively recognized this ‘leaning’ effect, and appropriately capped the inferior product.”<sup>32</sup>

Finally and importantly, capping inferior demand response resources does not prevent these resources from coming into the market - - it just requires them to come into the market either under the proposed cap or in the form of an annual resource after the cap is met. Nothing that PJM has put forth in this filing or any other filing prevents demand response from coming into the market as an annual product.<sup>33</sup> Dr. Shanker underscores this point on several occasions and rightly challenges CSPs to adjust their business models so as to shape their product as an annual one that can participate as a capacity resource without degrading reliability.

## **V. The Matter is Ripe for the Commission’s Decision**

P3 agrees with the PJM Utility Coalition in urging the Commission to resist requests for an evidentiary hearing or settlement procedures in this proceeding.<sup>34</sup> This matter is ripe for

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<sup>32</sup> Shanker Reply Affidavit at ¶P.41.

<sup>33</sup> Shanker Reply Affidavit at ¶P. 24.

<sup>34</sup> PJM Utility Coalition Comments and Protest , pp. 24-25.

decision given the price suppression and reliability concerns discussed above. In order to remedy the market problems and to stop the continuation of market disruption, PJM urges the Commission to issue an order accepting PJM's proposal. The next BRA is months away and failing to resolve this matter now will exacerbate the problem by allowing the upcoming BRA to take place using rules that PJM has admitted were in error.

There is certainly no need to wait as others have suggested until other PJM matters are decided. The Operational DR filing submitted on December 24, 2013, addresses operational issues associated with demand response in the real time market.<sup>35</sup> The DR Enhancements filing ensures that DR that commits to being a capacity resource has a legitimate chance of delivering in three years.<sup>36</sup> This current matter deals with the mechanics of the BRA that PJM admits were established in error. A decision can be made in this matter independent of the other initiatives.

The correction presented by PJM in the November 29 Filing restores the original intent and design of RPM and the sloping demand curve, and is also within the scope of FPA Section 205, as discussed above. Additionally it is extremely important to have this matter resolved prior to the May 2014 BRA. As stated by the PJM Utility Coalition, "The improper valuing of Annual Resources—the most important resources for reliability—will continue to send both planned and existing generators the wrong price signal, potentially forcing additional units to deactivate and/or preventing new entry when it is needed."<sup>37</sup> While approval of the PJM's proposal does not resolve all the issues associated with demand response, it is a step in the right direction - fixing a mistake while also allowing time to address the other issues that must be addressed.

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<sup>35</sup> *PJM Interconnection, L.L.C.*, Docket No. ER14-822-000 (filed December 24, 2013).

<sup>36</sup> *PJM Interconnection, L.L.C.*, Docket No. ER13-2108-000 (filed August 2, 2013).

<sup>37</sup> PJM Utility Coalition Comments and Protest, p. 25.

**CONCLUSION**

**WHEREFORE**, for the foregoing reasons, P3 respectfully requests that the Commission (1) grant P3's motion for leave to answer; and (2) consider this answer in formulating its Order on the PJM November 29 Filing.

Respectfully submitted,

On behalf of the PJM Power Providers Group

By: /s/ Glen Thomas

Glen Thomas  
Diane Slifer  
GT Power Group  
1060 First Avenue, Suite 400  
King of Prussia, PA 19406  
gthomas@gtpowergroup.com  
610-768-8080

Dated: January 6, 2014

**CERTIFICATE OF SERVICE**

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

Dated at Washington DC, this 6th day of January, 2014.

On behalf of the PJM Power Providers Group

By: /s/ Glen Thomas \_\_\_\_\_

Glen Thomas

GT Power Group

1060 First Avenue, Suite 400

King of Prussia, PA 19406

gthomas@gtpowergroup.com

610-768-8080

Attachment  
Reply Affidavit of  
Roy J. Shanker, Ph.D.

**UNITED STATES OF AMERICA  
BEFORE THE  
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PJM Interconnection, L.L.C.        )  
  )  
  )        Docket No. ER14-504-000

Reply Affidavit  
Of

Roy J. Shanker Ph. D.

Independent Consultant

January 6, 2014



UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.            )  
  )                    Docket No. ER14-504-000  
  )

Reply Affidavit  
Of

Roy J. Shanker Ph. D.

1) I am the same Roy J. Shanker who previously offered an affidavit (“Initial Affidavit”) in this proceeding. My qualifications are described in my earlier affidavit, and my *curriculum vitae* is attached as Attachment A thereto. My comments again are sponsored by the PJM Power Providers Group (“P3”).<sup>1</sup>

2) I was asked by P3 to review the answers submitted in this proceeding on December 20, 2013, and respond as appropriate to any of the issues raised regarding modifications proposed by PJM Interconnection, L.L.C. (“PJM”) to Attachment DD of its Tariff and the clearing of Limited DR and Extended Summer DR products in the RPM BRA auctions.<sup>2</sup>

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<sup>1</sup> The analysis and conclusions contained in this affidavit are solely mine and do not necessarily represent the views of any P3 member with respect to any issue.

<sup>2</sup> I use the same acronyms and defined terms in this affidavit as I used in my Initial Affidavit.

## Introduction

3) My comments focus on key aspects of only two of the many filings: (1) the protest of the Joint Consumer Advocates and Public Interest Organizations (“JCA”), including the supporting affidavit of Mr. James F. Wilson,<sup>3</sup> and (2) the protest of “Diverse Stakeholders” (“DS”), including the supporting affidavit of Mr. John Rohrbach.<sup>4</sup> To be clear, my silence on other aspects of these filings and other parties’ filings should not be construed as acceptance of, or agreement with, their positions and conclusions. Rather, I am simply trying to address some of the most important issues raised in a rather short time period.

4) In general, the JCA and DS Protests are critical of the PJM proposal, and advocate an alternative approach that was known as “Package B” in the stakeholder process that preceded PJM’s filing. I note that Package B did not receive the required super majority and was rejected by PJM. As discussed by P3 in the answer to these filings, even if these two filings opposing PJM’s proposal had merit (and I do not believe that they do), they are simply advocating an alternative that is not before the Commission in this proceeding. That the JCA and DS groups, as well as their witnesses, prefer this alternative has no bearing on whether the proposal which PJM has placed before the Commission in this proceeding is just and reasonable. To the contrary, I have been advised by counsel that even if the JCA and DS Filings proved that Package B was “better” than what PJM has proposed (and, in my view, it is inferior to the PJM proposal), that would not be a sufficient basis for the Commission to reject the PJM proposal.

5) In any event, I conclude that the PJM proposal is superior to the Package B approach advocated by the JCA and the DS groups, and that both their criticisms of

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<sup>3</sup> Protest of the Joint Consumer Advocates and Public Interest Organizations, Docket No. ER14-504-000 (filed Dec. 20, 2013) (“JCA Protest”).

<sup>4</sup> Protest of the Coalition of Diverse Stakeholders, Docket No. ER14-504-000 (filed Dec. 20, 2013) (“DS Protest”).

the PJM position and their assertions in support of Package B are materially flawed and at odds with PJM's basic planning assumptions. In contrast, the PJM proposal is a logical complement to PJM's planning study assumptions and analyses. As I discussed at length in my initial comments, the correction that PJM has proposed simply "falls out" naturally from their planning study assumptions and analyses and is a logical and consistent representation of the underlying planning assumptions that PJM makes across a range of planning studies. The proposed changes are also consistent with the long-term view of RPM addressing price stability, adequate compensation and reliability over an extended period of time, not just within a single auction.

6) In contrast, the JCA and DS Protests tend towards a myopic view of the issues with a number of inconsistent and illogical features. Four basic misunderstandings pervade these filings and account for a number of the flawed conclusions that the JCA and DS groups reach regarding the PJM proposal and the supposed advantages of Package B.

7) First, the JCA and DS Protests reflect a fundamental misunderstanding of how PJM accounts for inferior demand response products in its resource adequacy planning and the associated implications for reliability. Simply stated, PJM's IRM is established assuming all capacity is an annual product. The IRM does not consider the impact of any of the inferior DR products. The only way PJM could meet the one day in ten years (or "1 in 10") LOLE reliability target at the IRM would be if all resources were annual. Indeed, the DS group's misunderstanding of this issue is so profound that if one were to take some of the DS group's comments literally, then the floor representing annual reliability requirement constraints would have to be raised by over 11% (*i.e.*, from approximately 90% of the full requirement to 100%) to ensure that the "1 in 10" LOLE requirement, which they wrongly believe is being

met under the current approach, is satisfied.<sup>5</sup> Several other errors and inconsistencies in the JCA and DS Protests also reflect this same lack of understanding of PJM planning practices.

8) Second, both JCA and DS groups have carefully sidestepped the fact that RPM was explicitly designed not only to attempt to meet annual reliability requirements in a single commitment period, but also to convey price signals sufficient to support needed new entry and to retain needed existing generation over the longer term. Other than criticizing certain simplifying assumptions of Professor Hobbs's affidavit in support of PJM's proposal, neither the JCA nor the DS group shows how Package B would achieve lower costs while meeting reliability targets, which is precisely the benefit of restoring a downward-sloping demand curve for Annual Resources identified by Professor Hobbs and PJM.

9) Third, neither the JCA nor the DS group follow the logical implications of some of their criticisms regarding what they perceive as PJM's bias in favor of Annual Resources. In reality, PJM is eliminating an undue bias against Annual Resources that resulted from its earlier mis-step, and these parties ignore the fact that curtailment service providers ("CSPs") are free to adjust their product offers in such a way as to provide higher reliability value Annual DR or Extended Summer DR products. In fact, Mr. Wilson actually explains that packaging or aggregation of Limited DR can be used to create higher reliability, but lower quantity products.<sup>6</sup>

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<sup>5</sup> As explained below in more detail, DS mistakenly believes that PJM assures satisfaction of a "1 in 10" LOLE reliability standard under the status quo via the MARR. In fact, under the current approach, if PJM procured the MARR and the target values for Limited and Extended Summer, reliability would be degraded by 10%-20%. The MARR would have to be increased to match the original PJM IRM study results for the DS parties' statement to be correct. This would require an increase of over 11%.

<sup>6</sup> JCA Filing, Attachment, Affidavit of James F. Wilson in Support of the Protest of the Joint Consumer Advocates and Public Interest Organizations at ¶ 56 ("Wilson Affidavit").

10) Fourth, there appears to be a further misunderstanding with respect to PJM's implementation of the Short Term Resource Procurement Target ("STRPT" or "2.5% holdback") under the proposed corrections and the associated caps on the Limited DR and Extended Summer DR products. PJM has appropriately subtracted this amount from both caps in setting the constraints for the BRA. Only in this manner can PJM be assured that it would not further degrade reliability beyond the lowered level they already accepted should all of the STRPT be realized as the likely cheapest product, Limited DR.

11) Finally, while I understand that some of these issues may be outside of the scope of this proceeding, it should be noted that a number of the problems and complications reflected not only in PJM's proposal but in the JCA and DS Protests are the product of two other issues. I would recommend that these two problems ought to be addressed following approval of the instant filing: (1) the discriminatory Short Term Resource Procurement Target ("STRPT" or "2.5% holdback") practice, whereby 2.5% of demand is withheld from the BRA even as 100% of existing generation supply is subject to a must offer obligation; and (2) the participation in the market of inferior DR products with limited availability that only can appear to offer incremental reliability by "leaning" on annual resources.

12) PJM's proposal makes material improvements to the market while retaining the 2.5% holdback and inferior demand response products. As many parties noted in their filings, however, there are a number of issues affecting the efficiency of RPM and reliability in PJM that cannot be fully resolved until PJM and the Commission address these two flaws head on. To be clear, however, that does not mean that the Commission should delay approval of PJM's proposal in this proceeding, which is a necessary first step.

13) In the following paragraphs I address the major errors, misunderstandings and other deficiencies inherent in the DS and JCA Protests that undermine their

criticisms of the PJM proposal and their claims in support of the Package B approach.

### **Discussion—DS Protest**

14) The DS Filing evinces a fundamental misunderstanding of the PJM reliability planning standard, and of the role of the inferior DR products in the planning process. The DS group states:

The focus of PJM’s filing is the procurement of capacity beyond the Reliability Requirement. Presently, PJM establishes both a [MARR] and a [MESR]; implicitly, satisfying these requirements results in the procurement of capacity sufficient to meeting the Reliability Requirement and fulfilling the “1 in 10” LOLE criterion. Once the Reliability Requirement is met, excess procurement is subject to price competition among all resources. ...Instead of embracing competition at the margin, PJM opts to favor Annual Resources. Central to PJM’s efforts is PJM’s claim that, once the reliability target is met, Limited DR and [Extended Summer] DR have no value. From this incorrect premise, PJM attempts to alter the RPM rules so that only Annual Resources provide excess capacity, instead of allowing Annual Resources, Limited DR, and [Extended Summer] DR to compete to provide excess capacity.<sup>7</sup>

15) The foregoing statement mischaracterizes both the status quo and PJM’s proposal. The DS parties appear to believe that acquiring Annual Resources and Extended Summer DR up to the MESR is sufficient to satisfy the “1 in 10” year LOLE. This simply is wrong, and their mischaracterization of this fundamental aspect of the PJM planning process undercuts virtually every single one of their conclusions.

16) As I explained in my earlier affidavit, PJM plans to the “1 in 10” LOLE standard *before* allowing for an explicit degradation of reliability in order to accommodate the inferior Limited DR and Extended Summer DR products. In setting targets for these

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<sup>7</sup> DS Protest at 6.

products, PJM explicitly allows a 10% reduction in reliability from the “1 in 10” LOLE standard to accommodate the Extended Summer DR product and then for a further degradation to accommodate the even more inferior Limited DR product, which can only be called 10 times for no more than 6 hours for each event or a maximum potential of 60 hours during the summer,<sup>8</sup> as a subset of the allowance for the Extended Summer DR product.<sup>9</sup>

17) The fact that even with the Limited DR and Extended Summer DR targets enforced as caps, reliability has already been degraded to a level well below the “1 in 10” LOLE standard is a major reason why proper modeling of these inferior products, *i.e.*, through hard caps as proposed by PJM, is so essential. These proposed caps are consistent with the PJM planning assumptions, and allow for *no further* degradation of reliability beyond that already allowed by PJM in order to accommodate participation by these products up to the targets.

18) In fact, if PJM actually did what the DS Protest suggests it is already doing, the MARR would be set at **100%**, not approximately 90%, of the calculated capacity requirement (inclusive of reserve margin). That would be the only way in which PJM could be assured of meeting the “1 in 10” LOLE. An MARR set at 100% of the calculated capacity requirement would also be a necessary condition to the circumstance in which procurement of incremental Limited DR and Extended Summer DR could be characterized as increasing reliability. In any other situation, accepting incremental amounts of these inferior products would cause reliability to be degraded below the “1 in 10” LOLE standard.

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<sup>8</sup> Actual “use” hours could be much less. For example if each event only required 2 hours of curtailment, the 10 call limit would bind and only 20 hours of use would occur. Thus high load or net load volatility may require the same absolute MW under the IRM PRISM analyses, yet be less reliable with the same amount of Limited DR. These considerations are part of PJM’s establishment of constraints for the inferior DR product.

<sup>9</sup> See Initial Affidavit at ¶¶ 18-32.

19) The DS group’s false assumption that the status quo satisfies the “1 in 10” LOLE standard materially “taints” their subsequent conclusions. Consider, for example, the following statement: “PJM’s proposal is, unquestionably, an attempt to administratively dictate certain outcomes in the BRA. By limiting the amount of Limited DR and [Extended Summer ]DR that can compete against Annual Resources, PJM is putting its ‘thumb on the scale’ in favor of Annual Resources.”<sup>10</sup> The DS parties have it exactly backwards, because they do not understand the starting point. PJM is, in fact, attempting to lift its “thumb off the scale” to return to a level of reliability degradation that it previously found acceptable in order to accommodate these inferior demand response products in the first place.

20) This same misunderstanding is evident in the DS parties’ statements about pricing and adjustment of Annual products, such as its assertion that “PJM fails to observe that Annual Resources are fully permitted to develop and submit offers that are more competitive than the offers that Annual Resources currently submit.”<sup>11</sup> While it is true enough that market participants offering Annual Resources may modify their bids to adapt to changed rules, the same is true of those offering inferior sub-annual products. There is no reason why DR providers cannot make combined offers of the sub-annual products that are the equivalent of an annual product (and therefore directly competitive and comparable with other annual resources) or enter into price competition within the limits that PJM establishes under their proposed correction. The fundamental issue remains: the Limited DR and Extended Summer DR products are inferior from a reliability perspective. Additional increments of these products can only offer additional reliability by “leaning” on the superior and essential Annual Resources.

21) Further, even if the inferior sub-annual products did not result in a failure to meet the “1 in 10” LOLE standard, the DS parties’ proposal would still be unacceptable due to its price suppressive effects. Price suppression – particularly in the BRAs – will hamstring RPM from incentivizing new entry as needed and sending proper price signal to prevent

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<sup>10</sup> DS Protest at 16.

<sup>11</sup> *Id.* at 9.



the premature retirement of Annual Resources. Accordingly, the DS parties completely fail to recognize the long-term reliability and cost impacts.

22) Another example of how the DS group's misunderstanding of the status quo pervades their filing can be found in their concerns that in one of the "back casts" that PJM performed, the result was (in one instance in one LDA) for the price of the Limited DR product to be reduced 99%.<sup>12</sup> They obviously regard such a reduction as inappropriate. But by recognizing the need to limit the amounts of the inferior products accepted in order to maintain a level of reliability that PJM has deemed acceptable (even if it is below "1 in 10" LOLE), I fail to see the problem if there are offers at this low price. Assuming that the parties offered the Limited DR product at their marginal costs, this would have been a correct price. Of course, with a change of rules, there would likely also be a change in bidding behavior.

23) At the end of the day, it is simply a matter of perspective. Suppliers of Annual Resources under the status quo would appear to have a more valid question of why prices for the products they are providing have been suppressed to the degree indicated by PJM's analyses, even though they were offering a superior product. Similarly, these suppliers have a valid basis for asking why they faced a vertical demand curve while only the vastly inferior Limited DR product saw a downward-sloping demand curve.

24) This concern about the potential reduction in the price of Limited DR also underscores two other important concerns. First, as suggested above, in the face of a plentiful supply of low cost Limited DR products, one must ask why CSPs cannot aggregate their end use sites to create higher value Annual Resources. There is absolutely no bar to this and properly-crafted market rules should encourage demand response to enter the market in this superior form.<sup>13</sup>

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<sup>12</sup> See *id* at 18-19.

<sup>13</sup> This is a recurring observation that applies to virtually all of the comments critical of PJM. If there is any question of comparability and "right" pricing, the answer is simply to make the products all comparable by using multiple limited DR products to produce an annual product. The "value" would then be transparent.

25) Second, and as suggested in the last statement, a back cast is a back cast. It reflects bidding, aggregation and product formation behavior on the part of the bidders under the then-applicable rules. If the rules were different, one would fully expect the offers to be different as well. If the resulting incentives properly lower the value of Limited DR in comparison to Annual Resources, market participants could be expected to adjust offers and product types in an associated fashion. This outcome is a desirable market response that the Commission should foster.

26) The same is true of the DS Protest's statements about customers who sell Limited DR as a hedge. They claim that "[w]hen the compensation for Limited DR resources is significantly reduced (to almost \$0/MW-day), those customers will no longer have an incentive to offer into the BRA."<sup>14</sup> As an initial matter, if the product they are offering has so little value, it is hard to see why, in a properly-structured market, it should serve as a hedge virtually equivalent to annual capacity.<sup>15</sup> More importantly, there is absolutely nothing that prevents this same customer from creating a hedge by simply controlling its demand during periods of high load when individual customer capacity obligations are set ( the five coincident peaks), *i.e.*, "peak-shaving."

27) Many CSPs and retail energy suppliers provide end-users with detailed advice regarding how and when to curtail load to reduce the end-use customer's subsequent capacity obligation. If the customer can control its load during such periods, it can unilaterally reduce its capacity obligations as a wholesale customer. It may even be able to do so through reductions for fewer hours than the calls under the Limited DR product.<sup>16</sup> The point here is that PJM's proposal to more properly reflect the inferior

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<sup>14</sup> DS Protest at 19.

<sup>15</sup> For example, a customer hedging its requirements in the energy market would typically want to acquire a "full" hedge that covered peak and off peak capacity and energy. Alternatively, there is no reason to expect that a partial hedge based on only 60 hours of maximum participation would result in a full capacity hedge.

<sup>16</sup> Such peak-shaving is, in fact, a longstanding, accepted practice in PJM. *See generally PJM Interconnection, L.L.C.*, 135 FERC ¶ 61,212 (2011).

quality of the product, and assure that Annual Resources see the slope of the VRR curve does not necessarily preclude DR products being aggregated or customer behavior being modified in an effort to maximize the value of their ability to reduce consumption. It simply changes the incentives. In this case, I believe the change is appropriate, and as stated, consistent with PJM's underlying planning assumptions and the Commission's desire to have PJM and other system operators meet their reliability targets.

28) A separate criticism raised by the DS parties relates to PJM's treatment of coupled bids (*i.e.*, an offer to provide Limited DR at one price but to convert the product to Extended Summer DR for a premium) under the status quo. They note PJM's observation that under the current rules, the Limited DR component of a coupled bid is more likely to be accepted because of the objective function of the currently effective clearing mechanism, which effectively minimizes costs and maximizes the margin to the seller (under the erroneous assumption that the inferior product is fungible with the superior one after the MARR is met).<sup>17</sup> The DS parties then proceed to criticize PJM for not finding a different method of addressing coupled products under which the higher reliability product will be taken so long as it is also below the "clearing" price.

29) This criticism, however, has more to do with the fact that the existing rules fail to cap inferior products than with the way PJM addresses coupled bids. That this is the case can be seen by contrasting the existing constraints with those proposed by PJM. Under PJM's current rules, seeking the cheapest option after the MARR or MESR is met is a direct consequence of the error that PJM acknowledges. The selection itself is a natural consequence of incorrectly establishing a floor on superior products rather than a cap on the inferior products. As I said in my initial affidavit, after the floor requirement is met, a rational optimization will then try to minimize costs. I would note, however, that the Extended Summer DR substitution does take place depending on price in meeting the MESR "after" the MARR is satisfied.

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<sup>17</sup> DS Protest at 23-24 (citing PJM Filing at 15).

30) Moreover, it is unclear how one could capture what the DS parties propose through a closed mathematical form (*i.e.*, to take relatively higher reliability products from coupled offers after satisfying MARR and MESR requirements so long as the clearing prices stay the same) while retaining the other features of the existing structure they seem to want (*e.g.*, the MARR and MESR). It is also noteworthy they have offered no suggestions as to how this problem could be resolved.<sup>18</sup> The only solution I can imagine would be some sort of iterative, manual exercise of substituting Extended Summer DR after the auction, but that would introduce a number of problematic elements, not the least of which is the potential gaming opportunity. In any event, with the DS group having made no effort to explain how their solution could be implemented, all they have done is underscore the superiority of the changes PJM has proposed.

31) In fact, a rational substitution will occur under the formulation proposed by PJM. The solution will attempt to maximize overall surplus. If one assumes that the supply curve for these products is reasonably “flat,” then this is the equivalent of saying that the solution should maximize producer surplus, or the difference between either component of the coupled offer and the clearing price for that component. For example, consider a coupled bid of \$10 per MW-day for Limited DR and a willingness to provide Extended Summer DR at \$50 per MW-day. The results can be partitioned into several different conditions. First, the clearing prices for Limited DR and Extended Summer DR are below \$10 per MW-day and \$50 per MW-day, respectively, and neither component of the coupled offer clears. This is the simplest case. Second, only one component of the coupled offer is at a level below the clearing price. This is again simple: that component of the coupled offer clears, and the other does not. Third, and somewhat more complicated, the clearing prices for Limited DR and Extended Summer DR are above

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<sup>18</sup> Several parties have offered generic statements that with respect to coupled offers PJM should modify its objective function without offering specific guidance. Comments such as shifting the objective to “maximizing load value” are not particularly informative, as that is my understanding of the net impact of the current objective. This stems from the fact that the two inferior products “look” alike after the MESR has been satisfied, leaving only price to distinguish them. Implicitly, such suggestions imply the use of another metric (not cost to load or consumer surplus) related to reliability that is not addressed in the current formulation, or a different formulation such as PJM has suggested.

\$10 per MW-day and \$50 per MW-day, respectively. In this situation, one potential condition is that neither product quantity constraint binds, all products including annual are priced the same, and the right decision is to clear the Limited DR product bid at \$10 dollars. This solution makes sense as it obviously results in pricing and obligations where the supplier is “most satisfied,” has the greatest surplus, and the outcome matches its preference as bid. Similarly, this can be generalized to situations where both products clear, but one or both product constraints bind. In each of those situations it is again rational to accept the product (either Limited DR or Extended Summer DR) that results in the greatest supplier surplus. Extending the example, if Limited DR were constrained and cleared at \$11 per MW-day and Extended Summer DR were constrained and cleared at \$60 per MW-day, the selection would be for Extended Summer with the surplus of \$10 per MW-day versus \$1 per MW-day. But if Limited DR cleared at \$25 per MW-day and Extended Summer DR remained at \$60 per MW-day, the selection would switch to Limited DR, with the \$15 per MW-day margin. Note that this logic is true for coupled products inclusive of Annual DR. As discussed elsewhere, this allows a direct price signal to demand response providers to aggregate to higher value products when they believe that there will be a surplus of lower valued products such as Limited DR.

32) Both the DS and the JCA groups, as well as the JCA witness, Mr. Wilson, object to way in which PJM proposes to address the STRPT under its proposed changes. In establishing the caps for each of the inferior DR products, Limited DR, and the sum of Limited DR plus Extended Summer DR, for the BRA, PJM would subtract 2.5% from the maximum allowed degradation level. PJM’s logic for doing so is straightforward: the model must solve for an overall procurement under which all of the STRPT comes from the inferior products in order to prevent further reliability degradation (having already allowed degradation to significantly less than “1 in 10” LOLE). In order to reflect this concern and prevent that potential further degradation, the entire STRPT must be subtracted in exactly the manner that PJM proposes.

33) These criticisms appear to be the product of i) the fact that, empirically, some of the STRPT has been historically met by a combination of products including Annual Resources; and ii) a belief that imposing the STRPT limit in this fashion reduces market opportunities for the inferior products. Neither of these factors constitutes a legitimate basis for objecting to PJM's approach if one recognizes that PJM is conducting the RPM auctions as the party responsible for assuring reliability in the region. Having already accepted a 10%-20% degradation in reliability from the target "1 in 10" LOLE as the "cost" of allowing for participation of inferior products in RPM, it is entirely reasonable that PJM would want to assure that if the procured amount of products comes in "on target," there will be no opportunity for a further degradation of reliability. Modeling the STRPT in the way as PJM proposes provides such assurance. No one has suggested an alternative solution to this concern. Instead, they simply prefer to rely on the recent historic result based on incorrect incentives in order to "assume away" the issue.

34) To the extent that other parties are interested in providing greater opportunities for Limited DR and Extended Summer DR products in the BRA, the simplest solution would be to eliminate the 2.5% holdback. Of course, while this approach would increase opportunities for inferior products in the BRA, it would also remove a material source of price discrimination against Annual Resource suppliers. Not surprisingly, therefore, we do not hear either the JCA group or the DS group advocating this approach.

### **Discussion—JCA Protest**

35) The JCA Protest and accompanying affidavit from Mr. Wilson raise a number of concerns that basically fall into the general categories I have discussed above. In particular, like the DS group, the JCA group and Mr. Wilson fail to recognize the underlying implications of the inferior products on reliability, and instead focus principally on incremental reliability impacts after the system "leans" on Annual Resources, exaggerating the value of the inferior products. Mr. Wilson also makes

much of recent RPM results, discounting a fundamental purpose of this market, which is to create incentives for stability and price signals that will attract and retain appropriate levels of capacity over the long term.

36) In his affidavit Mr. Wilson cites five general reasons why, in his view, Package B is superior to the PJM proposal. I discuss each one of these reasons below and explain the limitations and errors in his conclusions.

37) The first reason cited by Mr. Wilson is that

PJM’s proposal to introduce a Sub-Annual Resource Constraint would prevent [Extended Summer DR] from competing with [Annual Resources] to provide excess capacity. This is discriminatory and raises cost without commensurate benefit. The Package B solution recognizes that once the MARR is satisfied, there is little difference in the incremental value of [Extended Summer DR] and [Annual Resources], and these resource types should be allowed to compete to provide excess capacity, as under the current rules.<sup>19</sup>

38) Mr. Wilson is mistaken for several reasons. While it is true that a cap would limit the total amount of Extended Summer DR and prevent this product from competing once the cap is hit, there is nothing unduly discriminatory about limiting the procurement of an inferior reliability product in an auction that is all about reliability. As I explained in my initial comments, PJM starts from the presumption of zero inferior products at “1 in 10” LOLE, and then makes a subjective determination of how much of the inferior products (and degradation of reliability below this standard) it can accept. In making this assumption, PJM also overestimates the availability of the inferior product, assuming that it is 100% available during the extended summer period, which it is not. Capping this amount is a reasonable manifestation of PJM planning assumptions in order to limit the potential degradation to reliability.

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<sup>19</sup> Wilson Affidavit at ¶ 18.

39) Further, Mr. Wilson wrongly assumes that the inferior products (Limited DR and Extended Summer DR) are fully fungible with respect to reliability after the MARR is satisfied. This is incorrect. As Mr. Wilson himself testified, that is only true in the limited context of adding an increment of supply, but not in the context where an additional increment of the inferior product might displace an increment of the superior product.<sup>20</sup> In addition, the incremental value, even when positive would not be the same between the two inferior products, and both have less value incrementally than an Annual Resource.

40) Even if more of the inferior product might be seen as having incremental reliability value in a single year, the oversupply of that inferior product will suppress prices. Mr. Wilson apparently wants to make permanent the price suppression that has occurred as a result of PJM's 2011 mistake. It is indisputable, however, that this price suppression will prevent RPM from encouraging new entry as needed and discouraging premature retirement of Annual Resources. This will result, in the long term, in precisely the sort of displacement of superior Annual Resources by inferior limited products that Mr. Wilson concedes will degrade reliability.<sup>21</sup> By improperly looking at RPM's performance solely in the auctions that have occurred to date, Mr. Wilson fails to recognize the long-term reliability impacts of the faulty market structure he is defending. The right conclusion is that price suppression, regardless of any short-term impacts (in either direction), will degrade reliability in the long term.

41) Another logical error in Mr. Wilson's analysis here is his notion that "competition" above the MARR currently occurs on a level playing field. This is simply not true. The only reason that the inferior product can bid in the first place is because of the disproportionate reliability contribution being made by the Annual

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<sup>20</sup> See *id.* at ¶ 50.

<sup>21</sup> See *id.*



Resources. In effect, those Annual Resources create an option for some acceptance of the inferior product.<sup>22</sup> Without that option, PJM could not accept any of the inferior products and still meet even its reduced reliability target.<sup>23</sup> Mr. Wilson ignores the fact that the inferior products are not fully fungible with the annual products across all reliability requirements. Any value from the inferior product is contingent on the existence of the annual products. What PJM has done is effectively recognized this “leaning” effect, and appropriately capped the inferior product.<sup>24</sup>

42) Mr. Wilson also ignores other, offsetting, adverse reliability impacts that occur even when there is an incremental addition to reliability via the inferior Extended Summer DR product. The most important of these is has to do with the distribution of LOLE over the year.

43) When PJM sets its IRM to meet the “1 in 10” LOLE prior to degrading reliability targets with the inferior products, all of the LOLE is concentrated in the high load summer periods. When PJM allows degradation below “1 in 10” LOLE by allowing for the acceptance of a certain amount of the Extended Summer DR product, some of the LOLE is shifted to the winter period and overall reliability reduced.<sup>25</sup> This is demonstrated by the two figures shown below.

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<sup>22</sup> Another way of thinking about this issue is to recall that the “time step” for reliability planning is a full year. In its initial IRM study PJM assumes all annual products and full flexibility to move the products around for maintenance. Only after this annual structure is in place, does PJM explore potential degradation from the inferior products. Thus the introduction of the inferior products is **conditional** on the reliability “superstructure” that is first put in place. Nowhere is this reflected in the current pricing. PJM’s correction is a move in the right direction to address this conditional nature.

<sup>23</sup> Note the earlier comments related to the DS parties. If the “1 in 10” LOLE standard were to be binding 100% of all products up the IRM would have to be annual, *i.e.*, the MARR would be 100% not approximately 90%.

<sup>24</sup> Another way of viewing this is recognizing that the starting IRM study **assumes only annual products** and sets a target reserve margin. The incremental degradation allowed for the inferior product builds on this base and depends on the existence of the annual products that remain. In this context the different inferior products are by definition not comparable or substitutable in full value for the annual product.

<sup>25</sup> As PJM explained in materials provided for the October 16, 2013 meeting of the Capacity Senior Task Force: By design, the current Extended Summer Reliability Target for the RTO

FIGURE 1-LOLE DISTRIBUTION PRIOR TO INTRODUCTION OF EXTENDED SUMMER

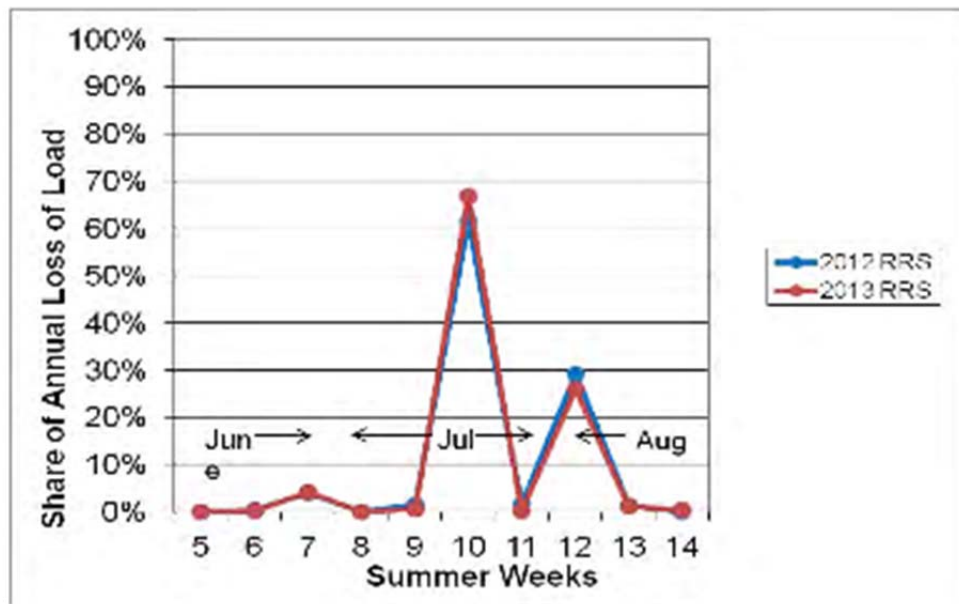
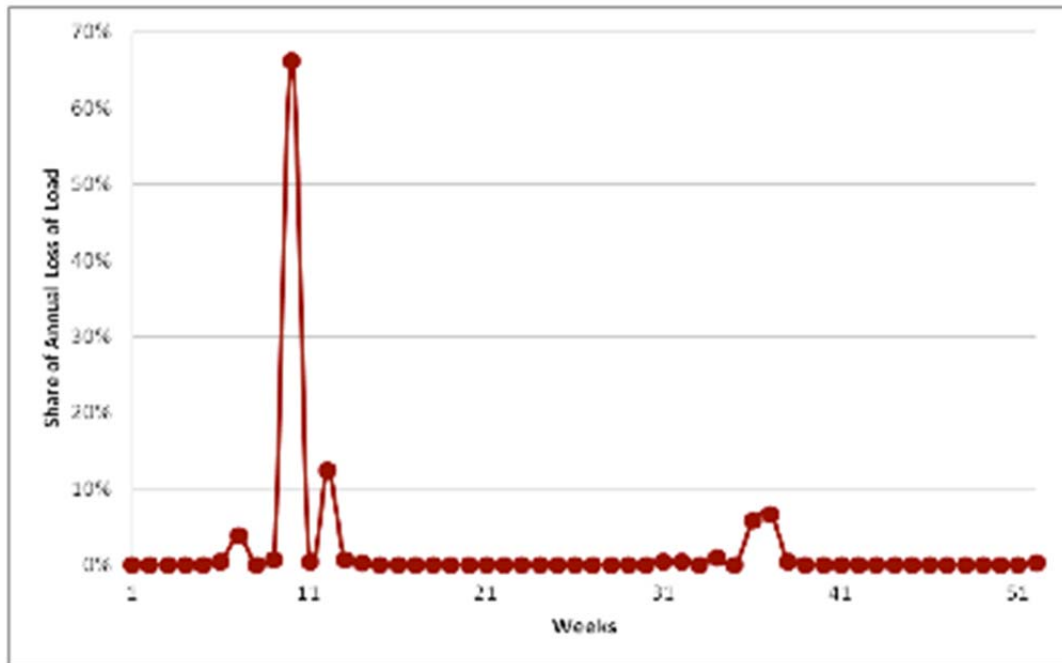


FIGURE 2-LOLE DISTRIBUTION AFTER DEGRADATION FROM INTRODUCTION OF EXTENDED SUMMER (“1.1 IN 10”)

is computed by taking the IRM base case and adding Extended Summer DR, replacing an equivalent amount of generation, until the RTO LOLE risk is increased by 10%. This increase in risk occurs because the IRM base case is constructed using annual resources only; when a resource of restricted availability, such as Extended Summer DR, is added to the system, displacing annual resources, there will be a certain amount of Extended Summer DR that will trigger LOLE risk during the weeks in which the restricted resources are not available. PJM, *Limited and Extended Summer Demand Response Targets: Additional analysis requested as part of the “Clearing of Limited DR” issue investigation* (Oct. 16, 2013), available at <http://www.pjm.com/~media/committees-groups/task-forces/cstf/20131016/20131016-item-04-limited-and-extended-summer-dr-targets.ashx>. The weekly distributions were provided as part of that presentation.

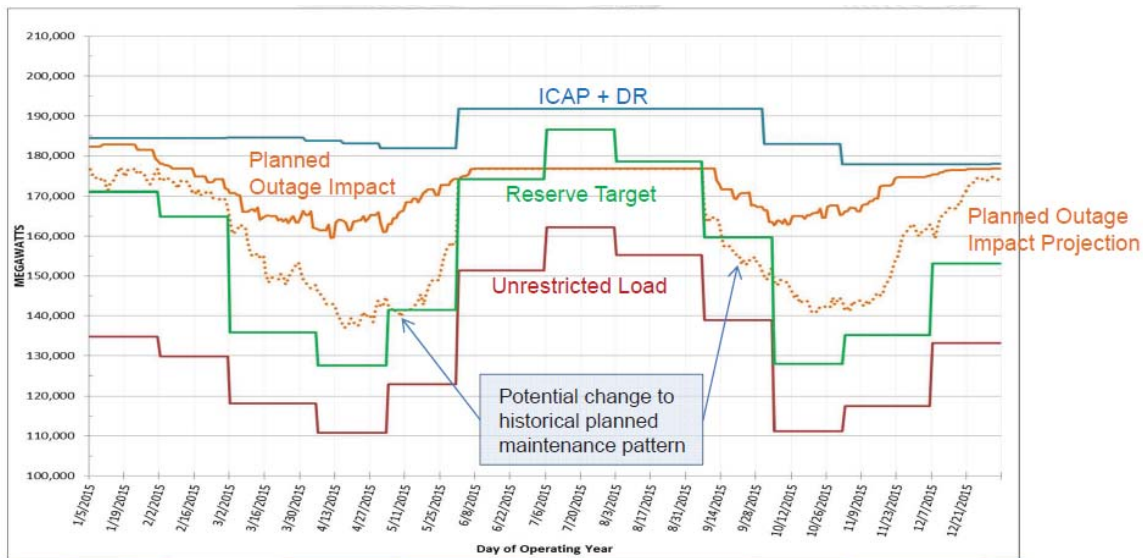


44) This is an expected result as having a summer-only resource restricts PJM’s flexibility in shifting and coordinating planned maintenance outages. As a result, the modeling of Extended Summer DR does not factor in the increased importance of gas/electric coordination or the fact that PJM will have depend on a more limited set of annual resources during the winter period. Both would be expected to create reliability issues that are not reflected in the current evaluation of Extended Summer DR and Limited DR degradation of LOLE.

45) Further, the impacts of this shifting of LOLE are not linear in terms of reliability impact. After a certain point, the system will simply run out of flexibility to accommodate planned outages, and further penetration of inferior Extended Summer DR and Limited DR products would be expected to have an even greater impact. This can be seen from a recent graphic PJM presented regarding seasonal availability of units and the associated impacts of potential outages related to

environmental constraints on the flexibility to “move resources around.”<sup>26</sup> PJM noted in this presentation that margins related to flexibility will be tighter in 2015. Higher reliance on Extended Summer DR and Limited DR at the expense of annual resources over time will exacerbate this problem.

FIGURE 3



46) As a last comment on this Wilson conclusion, it should be noted that the Package B approach that Mr. Wilson endorses retains an effectively vertical demand curve for Annual Resources. Mr. Wilson’s proposal has a MARR constraint that is vertical for all prices under the Net Cost of New Entry (“Net CONE”). While there is a sloped curve for periods when there is a shortage of Annual Resources, the MARR “curve” is vertical up to Net CONE. Much of Mr. Wilson’s reasoning depends on implicit assumptions regarding historic surplus conditions in PJM and forecasts that have proven “high” due to a slower than anticipated recovery in economic conditions. Extending those implicit assumptions to the effect of the MARR leads inevitably to the conclusion that as structured, the demand curve for Annual Resources would

<sup>26</sup> See PJM, *Environmental Regulations Impacts: Generation Outage Projections* at slides 6-7 (Dec. 19, 2013), available at <http://www.pjm.com/~media/committees-groups/committees/mrc/20131219/20131219-item-10-generation-outage-impacts.ashx>.

effectively remain vertical. It cannot be assumed, however, that these conditions would continue indefinitely.

47) Mr. Wilson's second point addresses provisions of the PJM proposal that apply when Annual Resources are "short" and, when combined with the capped Limited DR and Extended Summer DR products, would still leave PJM below the reliability targets. Mr. Wilson states:

In addition, by setting a maximum constraint on [Extended Summer DR], PJM's proposal fails to procure additional [Extended Summer DR] even when it is needed and available (for instance, when there is insufficient [Annual Resources] available; an illustrative example is shown later in this affidavit). This is irrational and could jeopardize reliability.<sup>27</sup>

48) Again, this reflects a fundamental misunderstanding of RPM's design elements and differing perspective. Mr. Wilson sees this situation as irrational, and would wish to further the price suppression associated with the use of the inferior products. In my view, however, the correct interpretation of this situation is that the long-term price signals are working to indicate a need for new entry of high reliability annual products. Interfering with that price signal for Annual Resources by taking more inferior reliability products would be exactly the wrong thing to do in this situation. The entire predicate of the use of a demand curve "anchored" at IRM plus 1% with a price at Net CONE is to send a higher price signal when resources are scarce. In this case, there is a shortage of the premium annual product that makes up approximately 90% of all resources. If there is a need for more annual products, then that need should be reflected in the price signal. Indeed, I would think that an underlying objective of PJM should be that in such a situation, the pricing should support the entry of higher value capacity products.

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<sup>27</sup> Wilson Affidavit at ¶ 18.

49) To be clear, traditional generators are not the only suppliers who will see, and have an opportunity to respond to, this price signal when annual resources are scarce. CSPs will see this same price signal, which should provide an incentive for them to aggregate Limited DR and Extended Summer DR resources in a fashion that allows them to qualify as an Annual Resource. Far from being irrational, this is exactly what RPM's long-term business cycle price signals are supposed to communicate.

50) Mr. Wilson's third point reflects a concern about reducing the levels of cleared Limited DR and Extended Summer DR, apparently on the theory that "more is better." Specifically, Mr. Wilson states:

...PJM's proposal restricts the quantity of [Limited DR] to a level far below the quantities cleared in recent auctions, and far below the Limited DR Reliability Target. In the CSTF Simulations of PJM's proposal, these restrictions caused the price of [Limited DR] to fall sharply, to \$1/MW-day in one instance. Thus, PJM's proposal would result in a cleared quantity of [Limited DR] that is well below the Limited DR Reliability Target (meaning that the [Limited DR] has full reliability value), while [Limited DR] would earn a price far below that of other resources, a discriminatory result.<sup>28</sup>

51) I certainly agree that PJM's proposal restricts the quantity of Limited DR significantly. I do not, however, share Mr. Wilson's view that there is anything wrong with doing so. Why should load be paying virtually the same, if not identical, prices for an inferior product that can only be called 60 hours a year or less? By the same token, why should not the clearing price for the inferior product be set by the offers of those willing to supply up to the constraining impact on reliability?

52) The correct resolution of these questions is all in the control of the party offering the DR products. As Mr. Wilson explains elsewhere, one could stagger Limited DR offers over time to create a longer period of DR calls, but with a lower

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<sup>28</sup> *Id.* at ¶ 3.

effective MW quantity.<sup>29</sup> In making this observation, he has answered his own criticism. If staggering the calls extends the duration of effectiveness but reduces the available quantity, why argue about the implicit value of an inferior product that PJM estimates will degrade reliability approximately 10% if it is allowed to make up only 4.9% of resources?

53) Ironically, in the process of effectively answering his own question, Mr. Wilson suggests that PJM make up for this reliability deficiency in the product by modifying its dispatch of the Limited DR product,<sup>30</sup> rather than the CSPs modifying their product to match a more reliable resource, but at a lower effective quantity. Such an approach based on the CSP's own costs and resource mix would, at least, help remove the inherent bias in favor of the inferior products. Importantly, however, it has the same effect of reducing the effective quantity of Limited DR.

54) Finally, the notion that for quantities under the target reliability level Limited DR has "full" value is nonsense. As I have noted before, from the outset PJM consciously recognized accepting any Limited DR would degrade reliability from target levels and the use of the inferior products is fully contingent on the existence of the annual products. The mere presence of inferior demand response products in the market results in a reliability degradation unless the IRM is adjusted upwards to reflect reliance on inferior products, or there is by chance a sufficient surplus collectively.

55) What Mr. Wilson really is saying is that, at the degraded level of reliability that PJM subjectively decided it would accept below the "1 in 10" LOLE standard, the Limited DR product will now receive a lower price. This is correct, and as it should be. Similarly higher value products will receive a higher price. There is nothing undue about discriminating between products in this manner. It is simply a more

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<sup>29</sup> See *id.* at ¶¶ 55-56.

<sup>30</sup> See *id.*

rational ordering of pricing *vis-à-vis* contributions to reliability and quality of the underlying product.

56) Mr. Wilson's fourth concern went to the overall cost impacts of the PJM proposal and was expressed as follows:

In the CSTF Simulations, PJM's proposal sharply raised the cost to consumers (by a total of over \$1.8 billion over the two years simulated), primarily due to the very low constraint on [Limited DR], but also due to the constraint on [Extended Summer DR] that drove up [Annual Resources] clearing prices. The Package B solution also raised the cost to consumers in the simulations compared to the status quo, but only by a relatively small amount (\$0.14 billion over the two years simulated), while meeting or exceeding all reliability objectives.<sup>31</sup>

57) This is yet another matter of perspective. Empirically Mr. Wilson's cost impact numbers are correct, assuming implementation of PJM's proposal would not alter bidding behavior and ignoring the potential impacts on energy prices. But there is another perspective, which I discussed in my initial comments. That is the perspective of suppliers of Annual Resources who now recognize that they were "shorted" by PJM's mis-step by almost \$2 billion over the last two BRAs and likely by a further billion dollars the prior BRA (2014-15), for which PJM did not publish results of a simulation showing the effects of its mis-step.

58) In drawing these conclusions, Mr. Wilson ignores the fact that the DR resources seldom provide energy in the real time or day ahead markets, and when they do, they likely set prices at the market maximum of \$1,800,<sup>32</sup> versus potentially cost-capped energy that always has a must offer obligation into the market. Similarly, he

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<sup>31</sup> *Id.* at ¶ 4.

<sup>32</sup> *See, e.g.*, Tariff Filing, Transmittal Letter at 6-8, Docket No. ER14-822-000 (filed Dec. 24, 2013) at page 6 (describing significant make whole payments paid to unneeded DR resources dispatched during the summer and fall of 2013) and accompanying Bryson Affidavit at page 8.



also ignores the long-run benefits PJM estimated. Both of these points were discussed at length in my initial comments.

59) Mr. Wilson's last point involves speculation about price separation between products within the BRA and between the BRA and incremental auctions. He states:

PJM's proposal was seen through the CSTF Simulations to create large price differentials between the various products in base residual auctions, and it could be expected to result in no price differentials in incremental auctions due to the treatment of the STRPT. PJM's proposal is also likely to further exacerbate the problem of large price differentials between base residual and incremental auctions. These price differentials, in addition to being a symptom of inefficiency, are considered to create incentive problems.<sup>33</sup>

60) I fail to see any problem here, and find Mr. Wilson's conclusions strained and speculative. To be sure, there is a larger price differential between products in the re-run BRA auctions. If I were to speculate, it would strike me that these price differentials better reflect the relative reliability value of the different products than did the previous auction results. I struggle to see how one can credibly argue that in the most recent auction there was absolutely no difference in reliability value between Limited DR, a 60 hour product with limited energy obligations and high energy prices, annual generation resources, 8,300+ hour products with energy must-offer obligations and cost based mitigation.<sup>34</sup> Yet that is exactly what Mr. Wilson must do in order to support this conclusion. If anything, these facts strike me as an admission that the current process is unjust and unreasonable, and that the PJM current modeling must be modified.

61) I have no comment on Mr. Wilson's conclusions regarding the relationship between the BRA and the incremental auctions, other than to state that no party has

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<sup>33</sup> *Id.*

<sup>34</sup> *See id.* at ¶ 25, Table 1.

put forth sufficient information to warrant any conclusion in this regard. The principal driver in the incremental auctions seems to relate to load forecast error, and presumably that could move in either direction, and swamp any other impacts that may be associated with a more appropriate valuation of inferior reliability products.

62) This concludes my reply affidavit.

UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.

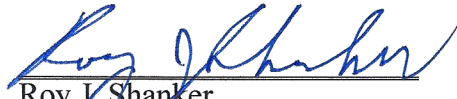
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Docket No. ER14-504-000

**AFFIDAVIT**

I, Roy J. Shanker, do hereby swear and affirm under penalty of law that the statements in the foregoing Affidavit of Roy J. Shanker, Ph. D. are true to the best of my knowledge, information and belief.

Executed this 6<sup>th</sup> day of January, 2014.

  
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Roy J. Shanker