UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)	**Docket No. ER14-2940-000**

REQUEST FOR REHEARING OF THE PJM POWER PROVIDERS GROUP

Pursuant to section 313 of the Federal Power Act ("FPA"), 16 U.S.C. § 825*l*, and Rule 713 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.713, the PJM Power Providers Group ("P3")[1] hereby respectfully requests rehearing of the Order issued November 28, 2014 in the above-captioned proceeding, *PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,183 (2014).

On September 25, 2014, PJM Interconnection, L.L.C. ("PJM") submitted proposed changes to its Open Access Transmission Tariff ("OATT"), pursuant to section 205 of the FPA, to revise certain of the pricing elements used to clear its capacity market auctions. Specifically, PJM proposed changes to its capacity market demand curve, the Variable Resource Requirement ("VRR") Curve, and VRR Curve cost inputs, including the cost of new entry ("CONE") by a

[1] As set forth in its Motion to Intervene, Comments and Limited Protest filed October 16, 2014 in this proceeding ("P3 Comments"), 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, encompassing 13 states and the District of Columbia. This rehearing request represents 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, please visit www.p3powergroup.com.

representative new power plant, and the energy and ancillary services revenues that such a plant would be expected to earn through its participation in the PJM markets.

The Commission issued its Order conditionally accepting the PJM filing on November 28, 2014. The Order addressed a number of issues raised by various parties.

P3 is requesting rehearing on two specific issues, both of which involve inputs to the VRR Curve: (1) the after-tax weighted-average cost of capital ("Cost of Capital"); and (2) the cost of labor. Regarding the Cost of Capital, the overall cost of capital and its three components, capital structure (aka debt/equity ratio), debt cost, and equity cost, are not set at just and reasonable levels. Regarding the cost of labor, it is understated due to, *inter alia*, reliance on aggregated data and use of inconsistent base case hours.

I. SPECIFICATION OF ERRORS AND STATEMENT OF ISSUES

The Order erred in the following respects:

1. The Order erred at P 76 in adopting an overall 8.0% Cost of Capital. This Cost of Capital is below a just and reasonable level and does not reflect the risk of a combustion turbine ("CT") project relative to a combined cycle ("CC") project. The resultant VRR Curve is thus unjust, unreasonable, and unduly discriminatory in violation of sections 205 and 206 of the Federal Power Act ("FPA"), 16 U.S.C. §§ 824d(a)-(b), 824e(a). Moreover, the Order's determination is not supported by substantial evidence in violation of FPA section 313(b), *id.* at § 825l(b), and section 10(e)(2)(E) of the Administrative Procedure Act ("APA"), 5 U.S.C. § 706(2)(E), and is arbitrary and capricious in violation of the APA, *id.* at § 706(2)(A). The Order does not satisfy APA requirements that the Commission "… be able to demonstrate that it has made a reasoned decision based upon substantial evidence in the record …," *Pacific Gas and Electric Co. v. FERC,* 373 F.3d 1315, 1319 (D.C. Cir. 2004) (quoting *Northern States Power Co. v. FERC,* 30 F.3d 177, 180 (D.C.

Cir. 1994)), and "… articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)).

2. The Order erred in P 85 in adopting a 60% debt, 40% equity capital structure. This capital structure is not appropriate for a CT and is not representative of recent generation projects in PJM; the resultant Cost of Capital and VRR Curve are unjust and unreasonable, unduly discriminatory, not supported by substantial evidence, and arbitrary and capricious. *See supra* Specification 1 (citing authorities). The Order further errs in not distinguishing other proceedings adopting a 50-50 capital structure. S*ee, e.g.*, *Motor Vehicle Mfrs. Ass'n*, *supra*, at 57.

3. The Order erred at P 90 in adopting a cost of debt of 7.0%. This debt cost is too low as shown by the data and analysis submitted by P3, and the resultant Cost of Capital and VRR Curve are unjust and unreasonable, unduly discriminatory, not supported by substantial evidence, and arbitrary and capricious. *See supra* Specification 1 (citing authorities). In addition the Order did not give adequate consideration to key points raised by P3, which violated due process and substantial evidence requirements under *Tenneco Gas v. FERC*, 969 F.2d 1187, 1214 (D.C. Cir. 1992), and *Office of Consumers' Counsel v. FERC*, 783 F.2d 206, 227 (D.C. Cir. 1986).

4. The Order erred at P 93 in adopting a cost of equity of 13.8%. This equity cost is too low as shown by the data and analysis submitted by P3, and the resultant Cost of Capital and VRR Curve are unjust and unreasonable, unduly discriminatory, not supported by substantial evidence, and arbitrary and capricious. *See supra* Specification 1 (citing authorities).

5. The Order erred at P 104 in accepting PJM's labor cost estimates which were in turn developed by the PJM Market Monitor. The labor cost estimates are flawed in reliance on aggregated data and use of inconsistent base case hours, and are inconsistent with the record evidence submitted by P3. The resultant VRR Curve is unjust and unreasonable, unduly discriminatory, not supported by substantial evidence, and arbitrary and capricious. *See supra* Specification 1 (citing authorities). In addition the Order did not give adequate consideration to key points regarding labor costs raised by P3, which violated due process and substantial evidence requirements under *Tenneco Gas v. FERC, supra,* and *Office of Consumers' Counsel v. FERC, supra*.

II. BACKGROUND

In order for capacity markets to work as intended, it is imperative that the parameters of the capacity market ("Reliability Pricing Model" or "RPM") auctions be set appropriately. In particular, CONE must reflect market conditions and the VRR Curve must yield stable investment signals over the long run. If these foundations are established correctly, RPM will perform as intended over the short-run and the long-run. As a result, resource adequacy will be maintained at the lowest reasonable cost to consumers.

This proceeding arises from the periodic "Triennial Review" of inputs to PJM's annual RPM "Base Residual Auctions," which are conducted three years prior to the start of a given delivery year based on auction parameters designed to meet forecasted system demand, plus reserves, during peak periods.

As the Order states at P 4 (footnotes omitted):

> To establish the auction clearing price, PJM utilizes the VRR Curve in combination with a supply curve. The supply curve is based on capacity

> suppliers' sell offers. Because this clearing mechanism is based on underlying market assumptions which may be subject to change, PJM conducts triennial reviews to examine and make recommendations regarding PJM's going-forward assumptions, including both the parameters and shape of the VRR Curve. PJM notes that, consistent with its prior triennial reviews, it retained an independent consultant, the Brattle Group (Brattle) to conduct the required simulation analyses and related assessments.

As the Order describes in PP 5-6, Brattle used probabilistic simulations of capacity auction outcomes to determine whether PJM's existing VRR Curve would meet PJM's resource adequacy and other capacity market design objectives, including: (i) an average loss of load expectation ("LOLE") of 1-event-in-10-years for the system as a whole and a 1-event-in-25-years LOLE for PJM's Locational Deliverability Areas ("LDAs"); (ii) an LOLE expectation falling below a 1-event-in-5-years standard, or 1 percent below PJM's Installed Reserve Margin ("IRM"); (iii) resiliency to changes in market conditions, administrative parameters, and other uncertainties, as balanced against the goal of avoiding over-procurements; and (iv) mitigation of price volatility and avoidance of conditions susceptible to the exercise of market power.

Brattle concluded that PJM's existing VRR Curve would not satisfy these objectives and would fail to achieve resource adequacy on a long-term average basis, at both the region-wide level and localized levels. As stated in the Order at P 7, "Specifically, Brattle found that the average loss of load expectation across all years would be 0.12, or 1.2 events in 10 years at the region-wide level, with reliability falling below a 1-event-in-5-years loss of load expectation in 20 percent of all years."

As stated in the Order at P 8, Brattle also reviewed PJM's existing CONE parameters. CONE represents the first-year total net revenue (net of variable operating costs) that a representative new generation resource would need to recover its capital investment and fixed costs, given reasonable expectations about future cost recovery over its economic life. Under

PJM's OATT, this representative new generation resource ("Reference Resource") is defined as a combustion turbine ("CT") power plant configured with two General Electric Frame 7FA turbines. PJM's OATT also establishes separate CONE estimates for each of five CONE Areas, as defined in relation to PJM's transmission owner zones.

Based substantially on the Brattle recommendations and data, PJM submitted a number of proposed changes to the existing RPM tariff provisions. These are summarized in P 9 of the Order.

Many parties submitted comments and protests with regard to the proposed tariff changes. In its Comments, P3 supported many of the proposed tariff changes.

P3 did protest PJM's proposed cost of capital assumptions, which significantly diverged from market conditions in a manner that materially altered the CONE calculation. Specifically, P3 was concerned that the Cost of Capital, debt/equity ratio, cost of debt, and cost of equity are not reflective of market conditions. Thus, the unrealistically low cost of capital assumptions employed in the CT reference unit CONE calculation resulted in an understated CONE that was used to set the VRR Curve.

P3 also protested the labor cost values proposed by PJM for not reflecting actual experience of companies engaged in construction of generating facilities within the PJM footprint and understating effective hourly wage rates, understating the basic number of hours required to construct the reference CT unit, and overstating reasonably expected productivity levels.

The result of these errors in PJM's filing, adopted by the Order, is to understate CONE. P3 concurs with the demonstration in the Brattle study that setting CONE too low can seriously undermine the operation of RPM and can degrade the reliability of the PJM system to levels far

below the applicable reliability standard. For this reason P3 respectfully requests rehearing so that the understatements of cost embedded in CONE and the VRR Curve can be corrected for the benefit of reliability in PJM.

III. THE COST OF CAPITAL IS TOO LOW.

The overall Cost of Capital is made up of three components, the capital structure, the cost of debt and the cost of equity. The Brattle approach develops an overall Cost of Capital, adopts a capital structure and cost of debt, and then "backs into" a cost of equity.[2] This rehearing request addresses all four of these elements, showing each to be understated.

A. The Overall Cost of Capital Is Understated.

The Order adopts an overall Cost of Capital of 8.0% as proposed by PJM in its filing. The P3 Comments, through the Affidavit of Messrs. Ryan Hardy and Mark Repsher ("Affidavit 1"), showed that PJM's methodology does not properly reflect the Cost of Capital of the reference unit, which is a CT unit. The analysis in Affidavit 1 also showed that Brattle incorrectly relied on corporate-level, publicly-traded financial metrics, which do not reflect recent project-level financed generation in PJM. The Order errs in rejecting P3's positions, as detailed below, and the Cost of Capital adopted is too low.

1. The Order Errs in Finding CT and CC Units to be Similar in Risk.

The Order rejects P3's observation that the Cost of Capital does not adequately reflect the relative risk of a CT unit. The Order states at P 80 (footnotes omitted):

[2] The Order appears to consider all four elements concurrently, rather than considering the cost of equity to be a value that is backed into from the other three elements. This rehearing request asserts that all four elements are understated and continues P3's perspective that the overall Cost of Capital should be derivative of the three other elements rather than the cost of equity being backed into from other three elements.

P3 argues that combustion turbine development is inherently more risky than that of a combined cycle unit. P3's claim, however, is not supported by empirical evidence. In addition, and as PJM notes in its answer, available evidence of the uncertainty of annual energy margins and the total of energy margins and capacity revenues earned by combustion turbine plants and combined cycle plants suggest no significant difference in risks. In support of its claim, PJM provides an analysis of the "standard deviations of annual cash flows from energy margins and the total of energy margins and capacity market revenues for the years 2007-13 as reported by PJM's market monitor, when normalized for the difference in [combustion turbine] and [combined cycle] CONE values, [which] are virtually identical for [combustion turbine] plants (12 percent) and [combined cycle] plants (13 percent) in PJM." PJM notes that it is therefore not at all clear that the overall investment risks are different for a combustion turbine plant versus a combined cycle plant. We find, therefore, that PJM's use of costs attributable to combined cycle and combustion turbine units is reasonable and supported by the record.

The Order is relying on the table below from the Brattle affidavit accompanying PJM's Answer filed November 6, 2014.

Table 3. Uncertainty of CT and CC Operating Cash Flows Earned in PJM Energy and Capacity Markets

	Units	CT	CC
MAAC 2017/18 CONE	*$/MW-year*	146,348	171,001
Energy			
Average Revenues	*$/MW-year*	21,635	79,251
Std Dev of Revenues	*$/MW-year*	9,086	18,347
Std Dev / CONE	%	6%	11%
Total			
Average Revenues	*$/MW-year*	63,438	120,245
Std Dev of Revenues	*$/MW-year*	16,942	21,412
Std Dev / CONE	%	12%	13%

Source: 2010 and 2013 PJM State of the Market Reports.
Note: Includes 2007 - 2013 revenues.

P3 believes that Brattle, and by extension PJM and the Order, have misinterpreted the data in this table. With regard to energy average revenues Brattle seems to take the position that the 6% standard deviation of energy average revenues divided by CONE for a CT is much less than the 11% standard deviation of energy average revenues divided by CONE for a CC, and

therefore a CT is less risky. This is illogical. The 6% value is a function of the low energy average revenues for a CT of $21,635/MW-year, and thus a low standard deviation, versus higher energy average revenues for a CC of $79,251/MW-year, and thus a higher standard deviation. It is simply the low energy revenues of a CT that caused Brattle to depict a CT as relatively low risk based on this energy revenue data.

What is more meaningful in terms of relative risk is the standard deviation of energy average revenues divided by energy average revenues, which is 42% for a CT unit ($9,086/$21,635) versus 23% for a CC unit ($18,347/$79,251) . This shows that the uncertainty of returns from a CT unit is much greater than from a CC unit.

Turning from energy revenues to total revenues, these also are dramatically different between CT and CC units. Brattle finds the risks of CT and CC units to be similar, 12% and 13% in terms of total revenues divided by CONE, but the 12% for a CT only occurs because CT revenues are low during the historical period. To illustrate the flaw one can consider a hypothetical that during this historical period CT total average revenues were even less, say half of what they actually were, i.e., $31,719/MW-year. If the standard deviation of the revenues also was halved (a proportionate reduction), then it would be $8,471/MW-year, and the resulting standard deviation divided by CONE of $146,348/MW-year would be about 6%.

Under Brattle's logic this 6% would mean that a CT is much less risky than a CC. This is an absurd result – low risk would be attributed to a resource solely because of its low revenues.

If, instead, risk were considered in terms of the standard deviation of total average revenues relative to total average revenues, then these would be 27% for a CT ($16,942/$63,438) versus 18% for a CC ($21,412/$120,245). In other words, the revenue risk of a CT is greater than a CC.

It also is important to note from total revenue data that the historical period is not representative of what should be expected in terms of return on investment going forward. For a CT unit the average total revenues divided by CT CONE is 43% ($63,438/$146,348), and for a CC unit the average total revenues divided by CC CONE is 70% ($120,245/$171,001).

The difference in these ratios shows a dramatic difference in average total revenues per investment in a CT versus a CC. This historical outcome would not be expected on a forward-looking basis because return on investment should be approximately the same for investments of approximately the same risk (and as shown herein a CT investment is riskier and therefore should if anything have a higher, not lower, expected return). As the Market Monitor states in the 2013 State of the Market Report (page 228): "… it can be expected that in the long run, in a competitive market, net revenue from all sources will cover the fixed costs of investing in new generating resources, including a competitive return on investment …."

Thus, on a forward-looking basis CT revenues would be expected to be much higher than historic revenues, with a correspondingly higher standard deviation. And, thus, in the long run under Brattle's approach there would be a much higher standard deviation/CONE value than the 12% that Brattle relies upon. This can be illustrated from the historical data in the Brattle table. For a CC unit average total revenue is 70% of CC CONE ($120,245/$171,001). This 70% can be applied to CT CONE to provide a revenue-equivalent average total revenue of $102,444/MW-year (70% x $146,348). If the CT standard deviation is increased proportionate to the increase in CT average total revenue, it becomes $27,359/MW-year ($102,444/$63,438 x $16,942), and this standard deviation divided by CT CONE is 19% ($27,359/$146,348). This is much more than the 13% value for a CC unit, showing that when the low historical CT revenues are adjusted to the historical CC revenues the revenue risk of a CT unit is much higher than for a CC unit.

Accordingly the 8.0% overall Cost of Capital is understated because it relies on data for a CC unit that is less risky that the reference CT unit. Brattle's attempt to demonstrate that a CT unit and a CC unit are equal in risk is fundamentally flawed as shown above, and accordingly the P3 adjustment for relative risk between a CT unit and a CC unit should not have been rejected in the Order.

2. The Order Errs in Relying on Company Rather than Project Data.

The analysis in Affidavit 1 submitted with the P3 Comments showed that Brattle incorrectly relied on corporate-level, publicly-traded financial metrics,[3] which do not reflect recent and current new build generation development in PJM.[4] Messrs. Hardy and Repsher noted that "the vast majority of recent and current new build generation development in PJM (and across the United States) is being driven by private equity and power generation development shops, which finance investments at the project level."[5] They found that more than 70% of the natural gas-fired projects (by capacity) currently under development in the PJM market are being developed by private equity or power generation development shops, and less than 10% of thermal capacity currently under development in PJM is being pursued by publicly-traded IPPs.[6]

[3] Affidavit 1, P. 6a.

[4] Affidavit 1, P 6a.

[5] Affidavit 1, P 6a.

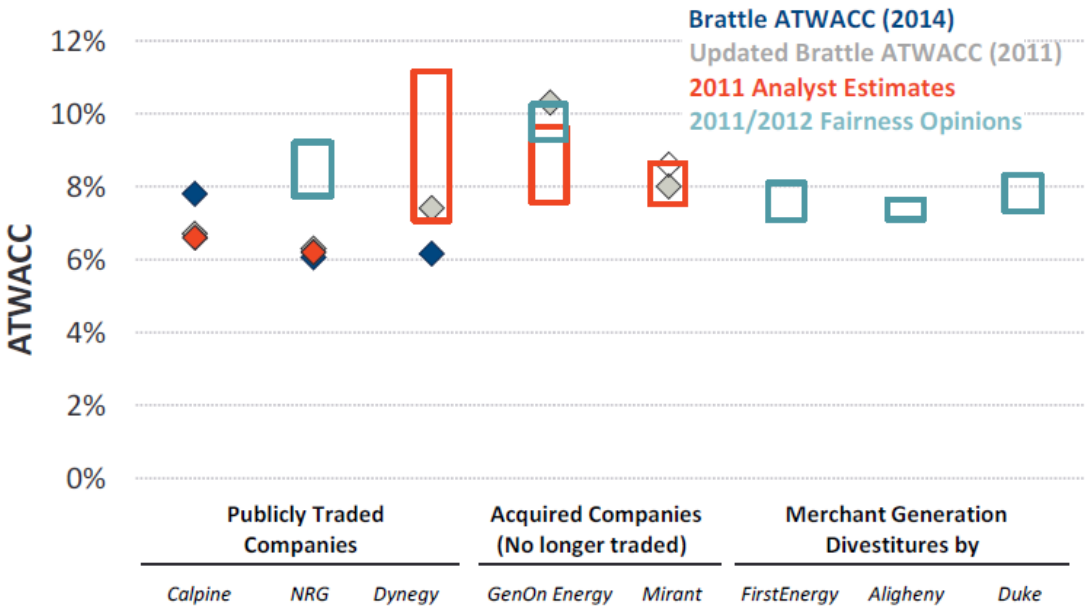
[6] Affidavit 1, P 7a, b.

The Order at P 81 acknowledges that company-level metrics are not representative of project-level costs, but finds that Brattle adjusted for the difference by using an 8.0% Cost of Capital instead of a 6.7% figure it derived from analysis of three companies (footnotes omitted):

> We concur with Brattle that for a generic merchant project within PJM's footprint, "the risks would be larger than for the average portfolio of independent power producers that have some long-term contracts and other hedges in place." Brattle also notes that merchant projects are able to mitigate *some* risk by arranging "medium-term financial hedging tools." We find these to be reasonable assumptions that balance the interests of investors and consumers when estimating CONE for a generic merchant plant in PJM. Accordingly, we find a 1.3 percent upward adjustment from 6.7 percent to 8.0 percent, which is "near the mid-point of the range of the additional reference points," to be just and reasonable.

While P3 acknowledges the difference between 6.7% and 8.0%, it is unclear how this difference fully recognizes the difference between company level and project level financing. The Brattle chart submitted with PJM's answer, showing all the reference points, is reprinted below:

Figure 4. Evidence Considered in Support of the 8.0% ATWACC



The reference points appear to converge around 8%.[7] And all the reference points are based on company-level data, not project-level data. Thus it does not appear that the need to base the Cost of Capital on project-level costs has been adequately reflected in the 8.0% value adopted in the Order.

Thus, this section and the foregoing section show that the overall Cost of Capital is understated in the Order.

B. The Appropriate Capital Structure Is 50% Debt, 50% Equity.

PJM proposed to utilize a capital structure of 60% debt and 40% equity. Affidavit 1 submitted with the P3 Comments showed this level of debt to be excessive. Brattle's recommendation of the 60-40 ratio was based on data for CC units.[8] Yet, CT is the sole reference unit technology, and Brattle and PJM made no adjustment to the financial parameters for this difference.

As P3 showed, the gross margin profile of a CT "… is inherently more risky than that of a CC, … and [Messrs. Hardy and Repsher] would expect PJM's debt leverage analysis to yield a lower percentage for CTs (and thus, a lower D/E ratio.)"[9] Furthermore, current actual CC development projects in PJM have averaged a 56%-44% capital structure.[10] As Affidavit 1 points out, the Commission has historically used a lower debt-equity ratio for the CT reference

[7] This is confirmed by the data on page 37 of the Brattle CONE study, as shown on pages 7-8 of Affidavit 1.

[8] The Brattle affidavit accompanying the PJM Answer relies on data for eight units in PJM (Table 2, page 12). All eight units are CC units as shown in Affidavit 2, Table 1.

[9] Affidavit 1, P 11a.

[10] Affidavit 1, P11b.

technology, with Brattle in PJM in 2011 and National Economic Research Associates, Inc. ("NERA") in New York in 2013 recommending a 50-50 ratio utilizing CT as the reference technology.[11] In addition, in ISO-NE, the approved 60-40 ratio is for a CC that allows new build generation to secure capacity payments for up to 7 years, which creates a more stable and secure revenue stream for financing when compared to PJM's capacity market where RPM revenues can be secured for only one year.[12] Messrs. Hardy and Repsher's analysis showed that a more reasonable capital structure range is 45-50% debt and 55-50% equity.[13]

The Order adopts PJM's proposed 60-40 capital structure, with analysis relevant to P3's evidence as follows (PP 83, 88, footnotes omitted):

> To determine an appropriate capital structure, Brattle relies on the five-year debt-equity ratio of each publicly-traded IPP using company 10-K reports for the value of debt and Bloomberg data for the market value of equity. Such data supports a 60-40 capital structure as reasonable.
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> * * *
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> While P3 correctly notes that a 50-50 capital structure has been used in other Commission proceedings, it can point to no precedent mandating such a capital structure in all cases. Here, PJM proposes a 60-40 capital structure and cites several companies operating in PJM in support of its claim that this capital structure is just and reasonable. Simply because a different capital structure was used in a different FPA section 205 filing, it does not follow that the capital structure proposed by PJM here is not just and reasonable. P3 also argues that Brattle's proposed debt-to-equity ratio is based on combined cycle and combustion turbine units and thus is inappropriate because the latter (PJM's Reference Resource) is a riskier investment. However, as we stated earlier, P3 provides no empirical evidence to support its claim. Therefore, we do not find that it supports a different capital structure. Additionally, while P3 proposes a "risk adjusted" capital structure of 50-50, its own data show that the average debt-equity ratio of new merchant projects in PJM is 58-42, which corroborates

[11] Affidavit 1, P 11c.

[12] Affidavit 1, P 11d.

[13] Affidavit 1, P 12.

> Brattle's proposed capital structure. P3 does not provide an analysis that would justify why a single component of ISO-NE's market design – the option to secure capacity payments for up to seven years – should be the basis for significantly different capital structures in PJM.

P3 believes there are three fundamental problems with the Order's adoption of a 60-40 capital structure. First, reliance on company-level capital structures is not appropriate. Earlier the Order concurs with Brattle that project finance risks are greater than company finance risks (P 81):[14]

> We concur with Brattle that for a generic merchant project within PJM's footprint, "the risks would be larger than for the average portfolio of independent power producers that have some long-term contracts and other hedges in place."

Higher risk necessarily entails less leverage. And this is supported by the capital structures of actual project financings which have averaged 56% debt and 44% equity, rather than 60% debt and 40% equity.[15] Thus, reliance on company level leverage is inappropriate.

Second, the Order disregards relevant precedent cited by P3[16] because P3 "… can point to no precedent mandating such a capital structure in all cases." Precedent should not be disregarded because there is no precedent mandating a like result in all cases. Precedent should be considered and distinguished if appropriate, or followed absent a rational basis not to do so.

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[14] The Order states the same finding at P 93: "… merchant generators have greater risk than publicly traded IPPs …."

[15] Affidavit 1, P 11b.

[16] As discussed in Affidavit 1, P 11c, these are proceedings involving acceptance of 50-50 capital structures in PJM and in New York in Docket Nos. ER12-513-000 and ER14-500-000, respectively. In PJM, Brattle had recommended a 50-50 capital structure which was reflected in PJM's filing, and that capital structure was not opposed. Table 46 on page 41 of "Cost of New Entry Estimates For Combustion-Turbine and Combined-Cycle Plants in PJM," August 24, 2011, submitted with PJM filing on December 1, 2011, *see also PJM Interconnection, L.L.C.*, 138 FERC ¶ 61,062 (2012); in the New York, NERA and Sargent & Lundy recommended a 50-50 capital structure which was reflected in the New York ISO's filing, and that capital structure was not opposed. *New York Independent System Operator, Inc.*, 146 FERC ¶ 61,043, at P 96 (2014).

This is required of reasoned decision-making. S*ee, e.g.*, *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto Ins. Co.*, 463 U.S. 29, 57 (1983).

Third, the capital structures of companies -- and of projects -- do not reflect the relative risk of a CT unit.[17] This is established in section III.A.1, *supra*, and that discussion is incorporated herein (rather than repeated).

For these three reasons the Commission should grant rehearing and adopt a 50-50 capital structure as supported by the record evidence presented by P3.

C. The Cost of Debt Is Unreasonably Low.

Based on Brattle's recommendation, PJM proposed to utilize a pre-tax cost of debt of 7.0%. P3's experts, Messrs. Hardy and Repsher found that a higher cost of debt would be necessary, particularly if the capital structure were set at the 60% debt, 40% equity ratio proposed by PJM.[18] Messrs. Hardy and Repsher found that recent project-financed cost of debt in PJM has averaged 7.7% and that has been for capital structures averaging 55% debt and 45% equity and where the units involved are CC.[19] With the CT reference unit the cost of debt would need to be higher and/or the debt-equity ratio would need to be lower.[20] For these reasons a 7.0% cost of debt could not be achieved under a 60-40 capital structure.[21]

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[17] This also is an appropriate basis for distinguishing Commission precedent in *Martha Oakley, Massachusetts Attorney General v. Bangor Hydro-Electric Co.*, Opinion No. 531, 147 FERC ¶ 61,234 (2014) ("Opinion No. 531"), where the reference unit is a CC unit. Affidavit 1, P 11a.

[18] Affidavit 1, P 14b.

[19] Affidavit 1, PP 14c and 15.

[20] Affidavit 1, P 14a, d.

[21] Affidavit 1, P. 16.

The Order adopts PJM's proposed debt cost and rejects P3's position for these reasons (P 90, footnotes omitted):

> P3 argues that Brattle's 7.0 percent cost of debt is too low, and identifies eight recent merchant projects in PJM and their associated debt costs in support. P3 argues that 8.5 percent is appropriate, because it is halfway between the midpoint and the top of the zone of reasonableness, "as highlighted in FERC [Opinion No.] 531." However, as noted previously, Opinion No. 531 made no such finding with respect to debt costs and P3's assertion to the contrary is inaccurate. Moreover, Opinion No. 531 concerned return on equity calculated using a discounted cash flow model and reflecting circumstances unique to that proceeding. Finally, P3's own data shows that since 2011, the average cost of debt for merchant projects is 7.1 percent, which corroborates Brattle's figure.

Although the Order is correct that Opinion No. 531 did not explicitly address the cost of debt, the same risks cited in Opinion No. 531 (discussed further in the next section) would pertain to all sources of capital and therefore the cost of debt should similarly be between the midpoint and the top of the zone of reasonableness. Further, the Order does not address P3's critical points which are that a 7.0% cost of debt is incompatible: (1) with a 60-40 capital structure and (2) with a CT reference unit. While it is the prerogative of the Commission to evaluate expert testimony and reach conclusions, this prerogative does not extend to disregarding important evidence on material issues. "Otherwise, the opportunities for notice and hearing in administrative proceedings would be largely illusory, with agencies free to disregard those facts or issues that prove difficult or inconvenient." *Tenneco Gas v. FERC*, 969 F.2d 1187, 1214 (D.C. Cir. 1992). A "FERC order neglectful of pertinent facts on the record must crumble for want of substantial evidence." *Id.* (citing *Office of Consumers' Counsel v. FERC*, 783 F.2d 206, 227 (D.C. Cir. 1986)).

The Commission should grant rehearing and adopt a higher cost of debt commensurate with the ultimate capital structure adopted and with the higher risk of a CT unit.

D. The Cost of Equity Is Unreasonably Low.

Brattle recommended, and PJM proposed, a cost of equity of 13.8%. The P3 Comments showed that this rate is unreasonably low. Messrs. Hardy and Repsher showed that reliance on publicly traded IPPs was inappropriate because it: "… ignores the fact that publicly traded IPPs have a lower risk profile than merchant new build power generation investors, which include private equity and power generation development shops. The publicly traded IPPs have not, and are not likely to, engage in the majority of new build generation development activity required to ensure reliability in PJM unless the risk profile of the market substantially changes."[22] Messrs. Hardy and Repsher found that a cost of equity of 13.8% is at the "low end of a reasonable zone for actual (active) project developer and investors in the PJM market."[23] The private equity and power generation development firms, "… are in general not as geographically, technologically, and/or contractually diverse as their IPP counterparts, thus adding incremental risk associated with discrete project development."[24] The proposed 13.8% cost of equity is "likely below the floor" taking into account factors that surround actual project development within the PJM market and corresponding risk profile, and the "inclusion of construction development and merchant operating risk creates incremental risk premiums that push the zone of reasonableness for COE above this floor. . . ."[25] In addition, the CT's greater reliance on capacity revenues presents a risker investment than a CC project, and this was not accounted for in PJM's

[22] Affidavit 1, P. 17.

[23] Affidavit 1, P 19.

[24] Affidavit 1, P 20.

[25] Affidavit 1, P 20a.

proposal.[26] Messrs. Hardy and Repsher concluded that the zone of reasonableness for the cost of equity is 15% to 20%, and specifically proposed 16.5%.[27]

The Order adopts PJM's proposed 13.8% cost of equity and rejects P3's analysis as set forth below (P 91, footnotes omitted):

> With respect to return on equity, P3 proposes a proxy group that includes, *inter alia*, private equity index funds with returns as high as 19.7 percent. However, as PJM notes in its answer, private equity funds' returns on equity are a poor proxy for determining the cost of capital for a merchant generation facility because these funds "consist of portfolios of investments in many different projects in many different industries." We agree, and find that a proxy group containing private equity index funds does not provide an adequate showing that the instant filing fails to meet its FPA section 205 burden.

P3 requests rehearing of the rejection of private equity fund cost of equity. Table 2a of Affidavit 2 accompanying the P3 Comments[28] identified eight new projects in PJM. All of the non-rate-based new projects are being developed by private equity firms, not the publicly traded IPPs identified by Brattle. Although the Order is correct that private equity indices reflect industries in addition to electric generation, they are the best available indicator of the equity cost of the type of entities actually developing new generation in PJM. It is inappropriate to exclude the active investors in the market.[29]

The Order stresses the importance of the proxy group being a good proxy (P 91 quoted above), but relies on an IPP group that P3 showed is not a good proxy. Opinion No. 531 and

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[26] Affidavit 1, P 20c.

[27] Affidavit 1, P 21.

[28] Affidavit of James A. Heidell & Mark Repsher.

[29] Affidavit 2, 14c. The projects are those that cleared Base Residual Auction ("BRA") Delivery Years 2015/2016, 2016/2017, and/or 2017/2018, and which achieved financial close.[29]

precedent cited therein are instructive that "the proxy group must be 'risk-appropriate'";[30] only P3 identified a proxy group with risks comparable to entities that are actually developing merchant generation projects in PJM. The IPP proxy group relied upon by PJM was not "risk appropriate" and therefore could not satisfy PJM's burden of proof under section 205 of the FPA.[31]

In addition, the Order does not provide reasonable grounds for distinguishing Opinion No. 531, and not setting the cost of equity above the midpoint of the zone of reasonableness. The Order at P 77 states that there were unique capital market conditions during the particular period involved in the Opinion No. 531 proceeding, but those conditions were cited as extremely low U.S. Treasury bond yields, which remain the case today.[32] And in terms of business risk characteristics of electric transmission cited in Opinion No. 531 (siting delays, project complexity, environmental impact proceedings, multiple jurisdiction approvals, liquidity risk for large projects relative to balance sheets, shorter investment history),[33] similar characteristics exist for merchant generation as well. In addition, as noted previously the reference unit in New

[30] Opinion No. 531, *supra*, at P 96 (selection of proxy group is a question of "capital attraction and comparability of risk") and n. 184 (quoting *Petal Gas Storage, L.L.C. v. FERC*, 496 F.3d 695, 699 (D.C. Cir. 2007)).

[31] *Nantahala Power and Light Co. v. FERC*, 727 F.2d 1342, 1351 (4th Cir. 1984); *Midwest Independent Transmission System Operator, Inc.*, 117 FERC ¶ 61,128 at P 25 (2006), *reh'g denied,* 119 FERC ¶ 61,097 at P 18 (2007); *California Independent System Operator Corp.*, 117 FERC ¶ 61,348 at PP 14, 18 (2006), *order on reh'g*, 121 FERC ¶ 61,193 (2007), *reh'g denied*, 136 FERC ¶ 61,197 (2011).

[32] Opinion No. 531, at P 145, note 285 (2014) (citing low U.S. Treasury bond yields). The U.S. Treasury 10-year bond yield as of December 26, 2014 was 2.25% which is below the yield of 2.64% when Opinion No. 531 was decided on June 19, 2014.

[33] *Id*. at P 149 ("For example, investors providing capital for electric transmission infrastructure face risks including the following: long delays in transmission siting, greater project complexity, environmental impact proceedings, requiring regulatory approval from multiple jurisdictions overseeing permits and rights of way, liquidity risk from financing projects that are large relative to the size of a balance sheet, and shorter investment history.").

England is a CC unit, as are the subject units in PJM, whereas a CT is the reference unit in PJM. This supports the validity of setting the cost of equity in this proceeding above the midpoint of the zone of reasonableness.

In summary, P3 showed that: (1) the zone of reasonableness for cost of equity for entities actually financing new generation in PJM is 15-20%, (2) analogous risk factors exist to those cited in Opinion No. 531 for selecting a return above the midpoint of the zone, and (3) the subject PJM units are CC units while the reference unit is a CT unit. Consequently a cost of equity of 13.8% is unreasonably low.

E. Recommended Cost of Capital Elements.

Based on the foregoing the overall Cost of Capital should be set at 10.80%, based upon a 50-50 capital structure, an 8.50% cost of debt, and a 16.50% cost of equity. An overall 8.0% Cost of Capital is below a just and reasonable level. The resultant VRR Curve is thus unjust, unreasonable, and unduly discriminatory in violation of sections 205 and 206 of the Federal Power Act ("FPA"), 16 U.S.C. §§ 824d(a)-(b), 824e(a). And, as shown in detail above, the Order's determination is not supported by substantial evidence in violation of FPA section 313(b), *id.* at § 825l(b), and section 10(e)(2)(E) of the Administrative Procedure Act ("APA"), 5 U.S.C. § 706(2)(E), and is arbitrary and capricious in violation of the APA, *id.* at § 706(2)(A).

IV. THE COST OF LABOR IS TOO LOW.

As part of the Triennial Review process PJM commissioned cost of labor data and analysis from the Sargent & Lundy consultancy to provide values for the CT CONE used to set the VRR Curves. Sargent & Lundy preformed comprehensive "bottoms up" estimates of the construction costs associated with CT and CC reference units. These estimates were

incorporated into the Brattle calculation of the gross CONE for each of these units.

As part of the stakeholder process for the Triennial Review, the Market Monitor proposed an alternate gross CONE calculation for the reference CT in CONE Area 1. This included several adjustments to the Sargent & Lundy estimates. PJM ultimately adopted the Sargent & Lundy estimates but adjusted them to reduce the estimated labor costs based on the Market Monitor presentations.

P3 supported the cost of labor elements developed by Sargent & Lundy. As demonstrated in the affidavit of Mr. Robert H. Uniszkiewicz[34] ("Affidavit 3"), accompanying the P3 Comments, the substitute labor cost values ultimately proposed by PJM were flawed because they do not reflect the actual experience of companies engaged in construction of generating units within the PJM footprint and, in particular, within CONE Area 1. PJM: (1) understated effective hourly wage rates, (2) understated the base number of hours required to construct the reference CT unit, and (3) understated reasonably expected productivity levels.

Notwithstanding these P3 objections, the Order accepted the Market Monitor substitutes for the Sargent & Lundy values. P3 respectfully requests rehearing because the three labor cost values are inadequately unsupported and are understated.

A. Effective Hourly Wage Rates Are Understated.

Regarding effective hourly wage rates, the P3 Comments stated that PJM understated these rates because PJM appeared to assume that work would be performed under a 40 hour work week. The P3 Comments supported a 50 hour work week as typical for this type of project because the inclusion of overtime is needed to attract high quality workers. P3 estimated that

[34] Mr. Uniszkiewicz is an engineer employed by PSEG Services Corporation with extensive experience in preparing estimates and monitoring the construction of power plants.

PJM's labor wage values were understated by 8% to 10% for CONE Area 1.

PJM's Answer provided an Answering Affidavit from Dr. Paul M. Sotkiewicz stating that he had considered overtime hours because he based his analysis on data from the Census of Employment and Wages ("CEW") published by the Bureau of Labor Statistics ("BLS") for "Utility Construction Wages" as designated under the North American Industrial Classification ("NAIC") which would include all remuneration, including overtime payments, for this work.

Based on this explanation P3 provided Reply Comments with a Responsive Affidavit of Mr. Uniszkiewicz showing that the data relied on by PJM would still understate overall wage rates. Mr. Uniszkiewicz explained (P 4):

> Based upon the additional explanation supplied in his Answering Affidavit, the apparent flaw in his analysis seems to relate to the aggregated data he is using. The NAIC grouping upon which he is relying is not limited to just power plant construction projects or even to the construction of projects within the electric power industry. The NAIC definition of a "Utility" is as follows: "The Utilities sector comprises establishments engaged in the provision of the following utility services: electric power, natural gas, steam supply, water supply, and sewage removal." This aggregated data can be expected to understate the wage rates for power plant construction workers because it apparently includes data about construction projects undertaken by workers with permanent full time employment arrangements with utility companies. Wages for these types of workers will typically be lower than wages paid to craft workers for power plant construction who move from job to job. Moreover, these workers will typically belong to different labor units than the craft workers for power plant construction and thus have different pay scales. In addition, permanent workers are less likely to work overtime on a continuous basis. Finally, the inclusion of data from industries other than the electric industry may also skew the results. Accordingly, I stand by my earlier conclusion that the wage rates are too low for CONE Area 1. Further, because the supporting BLS data for other areas would be aggregated as well, I would expect wages for power plant construction in those areas also to be understated in a similar fashion.

The Order at P 108 notes PJM's reliance on the CEW/NAIC data but does not address Mr. Uniszkiewicz's explanation of why that reliance was misplaced. Consequently, the Order

did not give adequate consideration to evidence presented by P3, which violated due process and substantial evidence requirements under *Tenneco Gas v. FERC*, 969 F.2d 1187, 1214 (D.C. Cir. 1992), and *Office of Consumers' Counsel v. FERC*, 783 F.2d 206, 227 (D.C. Cir. 1986).

B. Base Case Required Labor Hours Are Understated.

The Market Monitor's labor cost relied on a base case "required labor hours" of 360,000 hours for construction of the CT reference unit which was taken from a report stated to have been prepared by Stantec Consulting Services, Inc. ("Stantec"). The Stantec report, however, was not part of the record in this case and does not appear to have ever been made available to stakeholders. Thus, it cannot be considered available or transparent and should not be the basis for decision in this proceeding.[35]

Dr. Sotkiewicz's affidavit purported to demonstrate, based on his own analysis, that the Market Monitor values are "quite close" to values he determined independently.[36] Yet, while Dr. Sotkiewicz did include some support for the other two components of the calculation he used to verify Market Monitor values – the wage rates and the productivity factor – he did not include any record support for the third element of that calculation – the "required labor hours" taken from the Stantec report. Dr. Sotkiewicz did not profess to have independent knowledge of the accuracy of the 360,000 labor hour value nor did any other witness supporting the PJM filing.

Thus, the 360,000 labor hours value had the status of something the Commission was asked to accept based on a consultant's report that was not part of the stakeholder process or the

[35] *Cf.* Order at PP 105 and 106 stressing importance of publicly-available and transparent data.

[36] The affidavit supplied by Mr. Uniszkiewicz actually showed that the values calculated by Dr. Sotkiewicz vary in the range of about 1% lower to about 45% lower than the Stantec values depending on the CONE Area and whether the upper or lower bounds of the range in labor wages is used.

record in this proceeding. The only other "support" supplied by Dr. Sotkiewicz in his Answering Affidavit was the number of construction hours estimated by another consultancy, CH2M Hill, in the 2011 CONE proceeding, which the Commission set for hearing on various issues, including the cost of labor which was also disputed in that case.[37]

In his Affidavit 3 submitted with the P3 Comments, Mr. Uniszkiewicz showed that Dr. Sotkiewicz's unsupported adoption of the 360,000 value for base labor hours for construction of the CT reference unit was inconsistent with Mr. Uniszkiewicz's experience on other combustion turbine projects in New Jersey and Connecticut. According to Mr. Uniszkiewicz's calculation, based on actual projects completed in 2012, the Stantec number was understated by about 135% for CONE Area 1. Mr. Uniszkiewicz also performed a calculation using the values for labor wages and productivity from Dr. Sotkiewicz's affidavit (which Dr. Sotkiewicz indicated were vetted with Sargent & Lundy) to reconstruct from the Sargent & Lundy labor cost estimates the base case for required labor hours to construct the CT reference unit. Mr. Uniszkiewicz showed in this analysis that the implied Sargent & Lundy estimates of unadjusted labor hours required for construction of the reference unit CT appear to be about 76% higher (or 635,000 hours) than the Stantec value of 360,000 hours for CONE Area 1. Mr. Uniszkiewicz also performed this same analysis for the other CONE Areas and calculated that the implied Sargent & Lundy values for required construction hours were between 58% and 119% higher than the 360,000 hour value attributed to Stantec.

[37] *PJM Interconnection, L.L.C*, 138 FERC, ¶ 61,062, P 41 (2012) ("Here, we find that intervenors have raised a number of material issues of disputed fact as to the proper calculation of the Gross CONE values, as summarized above. Intervenors argue, for example, that PJM has failed to include accurate electrical and gas interconnection costs, property tax estimates, location-specific adjustments, and costs for material, labor and equipment.") .

In his Answering Affidavit, Dr. Sotkiewicz referred to other PJM witnesses employed by Brattle who indicated that the base case value used by Sargent & Lundy for the Eastern MAAC area was 368,000 hours -- which is close to the Stantec value. The Brattle witnesses indicated that Sargent & Lundy used a 1.19 productivity factor for the EMACC area which would result in 437,500 estimated labor hours for a project in that area.

In the Responsive Affidavit (P 6) submitted with the P3 Reply Comments, Mr. Uniszkiewicz showed that accepting these claimed Sargent & Lundy values for labor hours (368,000 base hours and a 1.19 productivity factor yielding 437,500 hours in Eastern MAAC) resulted in inconsistences between the wage rates calculated by Dr. Sotkiewicz in his Initial Affidavit and the implied wage rates derived from the Sargent & Lundy study. In the table reprinted below, Mr. Uniszkiewicz showed a comparison of the implied wage rates derived from the Sargent & Lundy construction labor cost estimates in the study prepared for the Brattle Group and submitted by PJM as part of its September 25, 2014 filing and the wage rates calculated by Dr. Sotkiewicz in his Initial Affidavit. Mr. Uniszkiewicz calculated the implied wage rates for Sargent & Lundy by dividing the 437,500 estimated labor hours for the CT project claimed by Brattle into the "Construction Cost" values set forth in Sargent & Lundy study.

Table 1: Implied Sargent & Lundy Wage Rates Compared with "Upper Bound" of Sotkiewicz Estimated Wage Rates

CONE AREA	CONE Area 1	CONE Area 2	CONE Area 3	CONE Area 4	CONE Area 5
S&L Implied Wages	$163.89	$126.63	$126.40	$124.57	$110.17
Sotkiewicz "Upper Bound" Wages	$98.88	$62.43	$74.62	$84.58 $	$57.22

As can be seen in the chart, there are significant differences in the values when no such differences should exist. Given that Sargent & Lundy reportedly was consulted about all three values used to derive the construction cost calculation, *i.e.*, the wage rates,[38] the "base case" labor hours,[39] and the productivity factor,[40] these large discrepancies between the wage rates should not be present. As Mr. Uniszkiewicz observed, this undermines the values used by Dr. Sotkiewicz in his validation computations and makes acceptance of his validation inappropriate.

What this shows is that neither the unsubstantiated Stantec figure (360,000 hours) nor Dr. Sotkiewicz's validation (368,000 base hours attributed to Sargent & Lundy) withstands scrutiny. Rehearing should be granted to either accept Mr. Uniszkiewicz's estimate of base case labor hours as input to the overall labor cost, or alternatively, to use the Sargent & Lundy overall labor cost rather than the invalid Market Monitor cost.

C. The Productivity Values Are Understated.

In his affidavit accompanying the P3 Comments, Mr. Uniszkiewicz showed that Dr. Sotkiewicz's productivity values were understated because of his assumption of a 40 hour work week. When workers remain on the job beyond a 40 hour work week their productivity deteriorates. For CONE Area 1, Mr. Uniszkiewicz determined that Dr. Sotkiewicz's value of 1.16 was too low and that, given an assumed 50 hour work week, an appropriate value would be 1.21. Mr. Uniszkiewicz also observed that, while he did not opine on specific wage rates or

[38] *See* PJM September 25, 2014 filing, Attachment C, Sotkiewicz Affidavit, P 42 ("Discussions with Sargent & Lundy indicated a range of fringe from 0.92 times the wage rate to 1.04 times the wage rate.").

[39] *See* November 6, 2014 Filing, Attachment B, Affidavit of Johannes P. Pfeifenberger and Bin Zhou, p. 23.

[40] *See* PJM September 25, 2014 filing, Attachment C, Sotkiewicz Affidavit, P 43 ("Discussions with Sargent & Lundy indicate a range of productivity factors between 1.13 and 1.19.").

productivity values other than for CONE Area 1, Dr. Sotkiewicz apparently erred by assuming a 40 hour work week would apply to construction in CONE Areas 2 to 5 which would tend to understate the true labor costs in those areas as well.

In his Answering Affidavit for PJM (at P 10) Dr. Sotkiewicz responded to Mr. Uniszkiewicz, stating that "most importantly" the impact on the overall CONE estimate would be less than 0.5% which he characterized as "not material." In his Responsive Affidavit for P3 (at P 8) Mr. Uniszkiewicz observed that if understated wage rate and the understated "base case" labor hours were corrected the impact on CONE "would be considerably larger."

The Order (at P109) accepts the productivity values proposed by PJM. The Order notes that the productivity values are consistent with those used in Brattle's 2011 CONE study for three CONE areas and higher than those used for two others. The Order also appears to agree with PJM that the differences are not material enough to show that PJM's CONE estimate is outside a range of reasonableness.

P3 respectfully requests that the Commission grant rehearing. Although the difference in the proposed productivity values does not greatly change the overall CONE estimate, an estimate should be as accurate as possible based upon all the evidence in the record. PJM referred to a range of reasonableness but there is no range for the overall CONE estimate, which instead is made up of the individual cost components. Each should be as accurate as possible.

D. Recommended Cost of Labor Elements.

Based on the foregoing the overall cost of labor should be based on the Sargent & Lundy values rather than the Market Monitor values adopted in the Order which are below a just and reasonable level. A VRR Curve based on the Market Monitor values is unjust, unreasonable, and unduly discriminatory in violation of sections 205 and 206 of the Federal Power Act ("FPA"), 16

U.S.C. §§ 824d(a)-(b), 824e(a). And, as shown in detail above, the Order's determination is not supported by substantial evidence in violation of FPA section 313(b), *id.* at § 825l(b), and section 10(e)(2)(E) of the Administrative Procedure Act ("APA"), 5 U.S.C. § 706(2)(E), and is arbitrary and capricious in violation of the APA, *id.* at § 706(2)(A).

V. CONCLUSION

For the foregoing reasons, P3 respectfully requests that the Commission grant rehearing and set the overall Cost of Capital at 10.80% and the cost of labor at the Sargent & Lundy values.

Respectfully submitted,

On behalf of the PJM Power Providers Group

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December 29, 2014

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the Official Service List compiled by the Secretary in this proceeding.

Dated at Washington, D.C., this 29th day of December, 2014.

On behalf of the PJM Power Providers Group

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