UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Public Citizen, Inc. v. Midcontinent Independent System Operator, Inc.	Docket Nos. EL15-70-000
The People of the State of Illinois, by Illinois Att'y General Lisa Madigan v. Midcontinent Independent System Operator, Inc.	EL15-71-000
Southwestern Electric Cooperative, Inc. v. Midcontinent Independent System Operator, Inc., Dynegy, Inc., and Sellers of Capacity into Zone 4 of the 2015-2016 MISO Planning Resource Auction	EL15-72-000
Illinois Industrial Energy Consumers v. Midcontinent Independent System Operator, Inc.	EL15-82-000

COMMENTS OF THE ELECTRIC POWER SUPPLY ASSOCIATION IN RESPONSE TO NOTICE OF TECHNICAL CONFERENCE

Pursuant to the Federal Energy Regulatory Commission ("FERC" or "Commission") Notice of Technical Conference[1] regarding the issues raised in several proceedings against the Midcontinent Independent System Operator, Inc. ("MISO"), the Electric Power Supply Association ("EPSA")[2] submits the following comments and attached Affidavit[3] to provide

[1] Notice of Technical Conference, *In re: Midcontinent Independent System Operator*, Docket Nos. EL15-70-000 et al., EL15-82-000 (Issued October 1, 2015).

[2] EPSA is the national trade association representing leading competitive power suppliers, including generators and marketers. Competitive suppliers, which collectively account for 40 percent of the installed generating capacity in the United States, provide reliable and competitively priced electricity from environmentally responsible facilities serving power markets. The comments contained in this filing represent the position of EPSA as an organization, but not necessarily the views of any particular member with respect to any issue.

[3] The affidavit provided in conjunction with our comments focuses on the key concept that market design fundamentals must be examined to correctly develop, and modify, assumptions underlying the calculations for reference levels, capacity import and export limits, and going-forward costs in any capacity market model. These calculations cannot be viewed as a source of market reform or improvements upon the current market

additional feedback regarding the issues discussed by FERC staff and participants at the Commission's October 20, 2015 Technical Conference ("Technical Conference"). EPSA appreciates the significant effort of Commission staff to swiftly arrange and efficiently moderate a robust discussion among a diverse range of panelists who represented a broad spectrum of MISO stakeholder interests. EPSA also thanks the Commission staff for providing an opportunity for EPSA's representative, Dr. Roy Shanker, to participate in the first session of the technical conference, and includes with these comments a complementing affidavit providing further analysis regarding certain key issues raised at the technical conference. In these comments, EPSA seeks to provide additional information and recommendations per direction provided by the Commission staff in the technical conference notice, which sought to obtain further information concerning the complaints referenced in the above-captioned proceedings. In support of this additional information and arguments, EPSA offers an affidavit prepared by Dr. Shanker, who is an expert in RTO markets generally and a particular expert in capacity market design. Dr. Shanker has been involved in the evolution of capacity markets in all the Eastern Region RTOs: ISO-NE, PJM, and NYISO. His affidavit is attached hereto as Appendix A and the Attachment RJS-1 provides his comprehensive credentials of work before state Commissions and the FERC.

EPSA believes that the critical takeaway from the FERC staff technical conference is that the Commission must confirm the objective function of the MISO capacity market through action on the pending Request for Rehearing of the Capacity Suppliers Group. The

design in a vacuum – these issues must be examined in conjunction with market design principles. As discussed in detail in the attached affidavit, this is an established principle that the Commission has affirmed for capacity markets in other ISOs/RTOs such as ISO-NE and PJM.

necessary corollary of *first* clarifying and reforming the MISO capacity market design is that the Commission should not require or recommend narrow ad-hoc changes to the MISO Tariff provisions regarding the ISO's resource adequacy construct in the absence of, or in isolation from, improvements to the broader market design.

EPSA also believes that the technical conference discussion demonstrated that the ad-hoc changes proposed in the above-captioned Complaints do not point to any realistic solutions – especially in the short-term or prior to the next PRA – that will effectively and holistically address capacity market design, price formation, timing, and resource adequacy concerns which lie at the heart of improving the MISO capacity construct. Likewise, nothing in these discussions indicated that consolidation of Zone 4 and Zone 5 would benefit consumers or MISO's reliability objectives. In fact, it is clear from the relevant discussion that, transmission constraints and political realities aside, the benefits of zonal consolidation are not forthcoming when the two zones in question have fundamentally different market designs (Zone 4 and Zone 5). Rather, the panel discussion demonstrated that combining these zones would result in the flight of capital from the restructured, retail choice markets to the vertically integrated markets, further hampering economic investment drivers and resource adequacy where it is critically needed.

EPSA further believes that in light of recent MISO action to initiate a specific resource adequacy stakeholder process to examine generator compensation issues in Zone 4 and other restructured retail markets, it may be premature for the Commission to order specific changes unless there is little visible progress in the MISO's broad reform process. MISO has released a statement announcing its intent to explore price formation and commitment

timeline reforms for the annual Planning Reserve Auctions ("PRAs"),[4] and has correctly identified market design flaws as the source of long-term resource adequacy problems that uniquely perpetuate in its restructured, retail markets. EPSA supports a meaningful stakeholder process that will help MISO effectuate market design changes to enhance competitive market outcomes in the restructured regions of MISO.

EPSA therefore requests that the Commission dismiss the Complaints and allow the stakeholder process time to develop a holistic solution to the MISO resource adequacy issues. Should those efforts prove unlikely to yield the needed reform, then the Commission should direct the rapid examination and development by MISO of the necessary market design changes needed to create appropriate long-term price signals for generators in Zone 4 and surrounding MISO regions. To allow for the consideration of the MISO Resource Adequacy Construct on a holistic basis, the Commission should expeditiously grant the rehearing request EPSA and other parties filed in Docket No. ER11-4081.[5]

Additionally, EPSA reiterates its views already expressed in the above-captioned proceedings that the Commission should dismiss the MISO Complaints, and adds that the technical conference discussion clearly shows that the Complainants' requests will not complement, enhance or help structure the necessary capacity market design reforms. EPSA notes that there has been no demonstration at the technical conference or in the Complaints which would support gross changes to the MISO Open Access Transmission, Energy and Operating Reserves Market Tariff ("MISO Tariff") provisions or the mitigation

[4] This and other capitalized terms not otherwise defined herein have the meaning given in MISO's Open Access Transmission, Energy and Operating Reserve Markets Tariff ("MISO Tariff").

[5] Request for Rehearing of the Capacity Suppliers Group, ER11-4081-000 (filed July 11, 2012).

paradigm that has been in effect for the recent capacity auctions.[6] Without making specific findings in response to the pending Complaints[7] that allege auction outcomes or certain Tariff provisions are unjust and unreasonable, there is no well-founded rationale upon which the Commission should order that the MISO Tariff's specific calculations toward the Reference Level be modified, or that Zone 4 boundaries be changed.[8] In the same vein, EPSA urges that, should the Commission consider any proposals that would seek ad-hoc modifications of the MISO Tariff pursuant to requests made outside the MISO resource adequacy process or outside the resource adequacy rehearing request in ER11-4081, the Commission must also consider whether those proposals would render just and reasonable results for the rest

[6] *See* Protest of the Electric Power Supply Association, Docket No. ER15-82-000 (filed July 20, 2015) (discussing that filings made before the Commission pursuant to Section 206 of the Federal Power Act seeking revisions to rates, terms and conditions pursuant to a public utility tariff must make an adequate evidentiary showing that the provisions contested in the filing are unjust and unreasonable, or identify otherwise actions or inactions that have occurred under those contested provisions that currently violate the applicable statutory standards or regulatory requirements); *Protest of the Electric Power Supply Association*, Docket Nos. EL15-70-000 et al., Midcontinent Independent System Operator (Filed July 2, 2015)(stating that "[a]s FPA Section 206(b) makes clear, Complainants bear 'the burden of proof to show that any rate, charge, classification, rule, regulation, practice, or contract is unjust, unreasonable, unduly discriminatory, or preferential . . . .' Consistent with this statutory requirement, the Commission has summarily denied complaints that 'consist largely of unsubstantiated allegations.'")(citing 16 U.S.C. § 824e(b) (2012) *and Michigan Elec. Transmission Co., LLC*, 116 FERC ¶ 61,164 at P 12 (2006) for the principle that a complainant bears the burden under Section 206 of the FPA to show that the existing [rate] is unjust and unreasonable). *Cf. ISO New England Inc.*, 151 FERC ¶ 61,226, at P 22 (2015) ("*ISO-NE III*") (stating that the Commission was "not persuaded by [protestors'] allegations that market manipulation affected [the auction results], as the record is devoid of any evidence to that effect.").

[7] *See* Illinois Industry Energy Consumers v. MISO, Docket No. ER15-82-000; Public Citizen, Inc. v. MISO, People of the State of Illinois, by Illinois Att'y Gen. Lisa Madigan v. MISO, Southwestern Electric Coop., Inc. v. MISO, Dynegy, Inc., and Sellers of Capacity into Zone 4 of the 2015-2016 MISO PRA, Docket Nos. EL15-70-000; EL15-71-000; EL15-72-000 (Consolidation Pending) (2015). [Collectively, "MISO Complaints"].

[8] *See* Protest of the Electric Power Supply Association in response to MISO Complaints, Docket Nos. EL15-70-000 et al., *Midcontinent Independent System Operator* (filed July 2, 2015), at pp. 2- 3 (arguing that the Complainants in the proceeding have provided no evidence that the 2015-2016 Planning Reserve Auction was not conducted in accordance with the MISO Tariff rules approved by the Commission, instead relying on comparisons with clearing prices in other zones and in past PRAs, which prove only that flaws in MISO's resource adequacy construct have, as expected, caused PRA clearing prices to be highly volatile and that clearing prices in zones dominated by vertically-integrated utilities do not accurately reflect the true costs of capacity.).

of the market, especially given that the overall current resource adequacy design is fundamentally flawed.

As the Complainants in the above-captioned proceedings bear the burden of demonstrating that provisions governing the auction (compliance with which resulted in the auction clearing prices) are unjust and unreasonable, the Commission's analysis of the conference and post-conference comments must necessarily begin from a frame of reference which also acknowledges that in Zone 4 specifically, the market produced a competitive price in compliance with appropriate provisions and mitigation pursuant to MISO Tariff rules approved by the Commission.[9]

EPSA has elaborated in two recent Commission filings and in its joint request for rehearing with the Capacity Suppliers' group that core areas of market design require FERC's attention, including buyer-side mitigation rules and a minimum offer price rule ("MOPR"), a sloped demand curve, and a forward commitment period of at least three years prior to the auction/planning year rather than the current two months.[10] Noting the Commission's interest in this comment period in ascertaining *additional* information, EPSA will not reiterate the details of its prior comments and hereby incorporates by reference its comments in the prior

[9] *See* Protest of the Electric Power Supply Association, Illinois Industrial Energy Consumers v. Midcontinent Independent System Operation, Docket No. EL15-82-000 (filed July 20, 2015).

[10] *Id.* at pp. 4 – 5 ("EPSA remains concerned that since the Commission's original 2012 order was issued approving the MISO Construct which established the PRAs,[10] pending before the Commission in an extensive proceeding (dating back to 2011) are requests for several needed reforms to the Construct, which have not yet been addressed.[10] As EPSA and many others have cautioned repeatedly in this proceeding and generically, continued reliance on a vertical demand curve creates volatility resulting in steep price differences given small changes in supply and/or demand, as has occurred most recently in Zone 4.[10] Other market reforms proposed in that proceeding are also ripe for Commission action, including: implementing buyer-side mitigation rules such as a minimum offer price rule ("MOPR"), a mandatory capacity market,[10] eliminating the flawed "opt-out" provision (the Fixed Resource Adequacy Plan or "FRAP") in the MISO Tariff,[10] effectuating a much longer forward period (at least three years) than the current two-month forward period, and addressing the potential for price separation given market design in MISO auctions run for both restructured and vertically-integrated states.").

proceedings. Below, EPSA's comments highlight issues arising from the technical conference, and developments in the MISO region since the technical conference, as further support for the notion that addressing fundamental market design flaws is a first priority for effective, meaningful reforms that can enhance resource adequacy and reliability in MISO. While the Commission should defer to the MISO stakeholder process in the first instance to develop solutions to these market design flaws, it should grant the pending Capacity Suppliers' Group rehearing on the MISO Resource Adequacy Construct to the extent that stakeholder process is not fruitful or advancing in a reasonable, timely manner.

A. The Commission Should Support MISO's Resource Adequacy Reform Efforts, Dismiss the MISO Complaints, and Confirm that the Objective Function of the MISO Capacity Market is to Assure that Capacity Suppliers Are Incented to Retain Existing Economic Units and Make New Investments Sufficient to Maintain Reliability.

Since the date of the technical conference, MISO has released a Statement of Issues draft[11] which submits that the ISO's current market construct works for Load Serving Entities in the regulated states, but does not provide long-term price signals required to retain existing generation and incentivize investments and new entry toward ensuring region-wide reliability in MISO's restructured, competitive retail markets. While MISO has not yet provided a specific timeline at this point, over which it would create a specific proposal for a workable forward resource adequacy planning process for its restructured competitive markets (including Zone 4, Southern Illinois), MISO does indicate its intent to invite comments from stakeholders as a first step in the process of reassessing resource adequacy processes and

[11] MISO Staff Release, Draft, October 2015, Publicly Available on MISO website at: https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/SAWG/2015/20151029/20151029%20SAWG%20Item%2007%20Draft%20Issues%20Statement_RA%20in%20Restructured%20Markets.pdf.

procedures. The following is a summary of the specific resource adequacy design concerns raised in MISO's draft Statement. EPSA believes these statements are an accurate, robust representation of some of the priority issues that have been raised in prior discussions in the above-captioned proceedings, and in the Capacity Suppliers' Request for Rehearing pending in Docket No. ER11-4081, and that these issues are appropriately prioritized in MISO's stated work plan:

- *MISO's resource adequacy construct may not provide a price signal sufficiently in advance that will result in efficient investment in needed new resources or to sustain investment in existing resources, and to signal when less-efficient resources should retire. Suppliers in restructured competitive markets (primarily generators) rely upon these prices to sustain operation and to make investment decisions that support resource adequacy to ensure reliability.*

- *Historically, the MISO region has maintained capacity levels in excess of the required Planning Reserve Margin, which are due in part to a lower Planning Reserve Margin (a benefit of belonging to a large Regional Transmission Organization) and largely flat load growth since the 2008 economic recession. However, the electric industry is experiencing dynamic shifts. Changes include the retirement of base-load resources in the face of environmental regulatory requirements, the introduction of variable resources such as wind and solar, energy efficiency, and historically low natural gas prices. In this environment, a market that solely delivers price signals reflecting short term excess as is the case today may become insufficient to produce a timely signal for investment in new resources when needed for the long term.*

  The price signal sent by the current Planning Reserve Auction (PRA) may suffer from both the potential for substantial year-to-year volatility and the inability to efficiently recognize the marginal reliability value of incremental capacity resources. As a result, the price signal produced may not suffice in the future as efficient or reliable enough to serve as an investment signal in a fully competitive retail market such as Illinois. Better price signal for supporting restructured competitive retail markets could include a capacity price that: 1) efficiently recognizes the marginal reliability value of incremental capacity relative to the regional and zonal planning requirement and 2) has modest year-to-year volatility driven mostly by the normally small changes in supply availability and demand growth year to year.

- *More efficient resource procurement price signal mechanism should account for the competitive alternatives that may be offered by new entrants in restructured competitive markets. Since the price signals sent by the current PRA are established only 2 months in advance of the compliance period, new entry alternatives may seldom be a part of the price formation in the auction. As a result, few if any supply offers may represent the cost of new resources even if new resources might be less expensive and/or needed to meet reliability within as little time as 14 months in the future*[12]

MISO is not the only regional entity that has recognized and made an open commitment to addressing its market design problems and recognizing that the resource adequacy construct as a whole is impacting reliability. The Illinois Commerce Commission has announced that on November 19, 2015, it will hold a winter preparedness and resource adequacy meeting to explore specifically the unique challenges and threats to reliability within Zone 4, Southern Illinois (discussed therein as "Resource Adequacy in the Ameren Illinois footprint").[13] In that announcement, Commissioner Maye-Edwards stated: "MISO's goal to ensure enough capacity is available to meet the needs of all consumers in the MISO footprint during peak times at just and reasonable rates is critical. With *diminishing excess supply* and the *narrow timing* of the MISO Planning Resource Auction, I believe this is the right time to explore this issue in greater detail" (emphasis added).[14] One of the key questions the Illinois Commission plans to address at this meeting is what improvements or changes MISO should be making to the RAC, and what primary concerns stakeholders have

[12] Issues Statement (Draft), Resource Adequacy in Restructured Competitive Retail Markets, MISO Staff (October 2015), available at: https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/SAWG/2015/20151029/20151029%20SAWG%20Item%2007%20Draft%20Issues%20Statement_RA%20in%20Restructured%20Markets.pdf.

[13] Thursday, November 19, the Illinois Commerce Commission will host a Planning for the Future Policy Session to explore the issues surrounding 2015-2016 Winter Preparedness and Resource Adequacy

[14] *Id.*

regarding long-term Resource Adequacy in the Ameren Illinois footprint. It is clear that these discussions will likely lead to a similar conclusion as has been made by MISO – that the RAC requires significant design reforms to support a competitive, robust, and transparent forward-looking capacity market that will incent new entry and retain existing economic generation for the benefit of MISO's consumers and reliability preparedness.

In light of these ongoing efforts within the Illinois region that highlight critical reliability issues stemming from market design flaws in Zone 4, EPSA emphasizes that it would be premature for the Commission to take action that modifies the MISO mitigation paradigm through isolated changes to the MISO reference level or capacity import/export calculations. Such changes would also interfere with the MISO's stakeholder process efforts to develop meaningful, prospective changes to support reliability in its restructured markets while also creating additional uncertainty prior to the next capacity auction.

EPSA reiterates that modifications to the mitigation framework and rules governing the 2015-2016 PRA must be carefully developed outside the isolated context of the pending Complaints. The Complainants do *not* condition their allegations and requests on the essential predicate that any long-term changes that will have a significant impact on all MISO stakeholders' economic interests must occur in conjunction with broader changes to market design. Without those broader changes, the enhanced market transparency, reduced price volatility, and increased investments needed to support long term reliability for the benefit of MISO's electricity consumers, will not materialize. The technical conference discussions demonstrate further that the mere fact of refining the edges of the capacity construct in MISO will not solve the deeply embedded market design issues, and a rushed effort to accommodate the Complainants' narrowly constructed requests will only undermine market

confidence in the finality of the auction results and dampen the MISO resource adequacy market's ability to convey necessary price signals to retain economic resources and incent new entry.

EPSA therefore notes that the most constructive role for the Commission in the short term would be to assist and support the MISO stakeholder process by dismissing the Complaints. To the extent the stakeholder process proves to be ineffective, then the Commission should grant rehearing in the Resource Adequacy Proceeding and order the implementation of key improvements to MISO's resources adequacy construct: implementing buyer-side mitigation rules such as a minimum offer price rule ("MOPR"), eliminating the flawed "opt-out" provision (the Fixed Resource Adequacy Plan or "FRAP") in the MISO Tariff, effectuating a longer forward period than the current structure of a two-month commitment period prior to the Planning Year, and addressing the potential for price separation given that the MISO auction market design is run for both restructured and vertically-integrated states.[15]

EPSA also notes that this recommendation is supported by on-the-record discussions at the Commission's recent technical conference, where participants made comments indicating that market design fundamentals need to be addressed by FERC, potentially through directives to MISO. For example, FERC Staff inquired at the technical conference whether the capacity market design has created the right incentives for investment in MISO. The MISO Independent Market Monitor Dr. David Patton responded that there continues to

[15] These issues are comprehensively discussed in prior EPSA filings, both in EPSA Protests in response to the MISO Complaints, and in the Joint Motion of the EPSA and Capacity Suppliers Group's pending request for rehearing in Docket No. ER11-4081-001.

be uncertainty within MISO as to whether or not the true objective of the ISO's capacity market, in combination with the energy and ancillary services markets, is to facilitate efficient investment and retirement decisions. He remarked that the Commission has yet to state as it has for the other Eastern RTOs, that the market should be designed to facilitate these long-term investment drivers.[16] Patton further noted that in MISO there is a shrinking supply of megawatts because of retirements prompted by environmental regulations, and that the wholesale market in MISO cannot satisfy the resulting shortfalls because of constraints like the vertical demand curve which inherently skews the representation of demand and the appropriate valuation for capacity. Patton also suggested that even if the Commission did not mandate a sloped demand curve as it did in New England, the Commission should articulate design objectives to help form better investment signals in the wholesale markets, in his view.

In the same discussion, MISO's Jeff Bladen added that MISO continues to be committed to working with its stakeholders and with the states to ensure that the market design objectives, even without specific Commission action, are intended to get "both the reliability outcome and the efficient investment that is needed for the region based on particulars of the states' regulatory construct" (sic). Bladen further referenced the upcoming Illinois Commerce Commission proceeding, described in comments above, but also stated in agreement with Patton, that "it is a difficult question to answer and ultimately FERC has to judge, 'is that the right design objective?'"

[16] Technical Conference on MISO Planning Resource Action - October 20, 2015, Official Transcript, Ace-Federal Reporters, at pp. 61 lines 10-25, pp. 62, lines 1-11; pp. 64 lines 16-18, 14-17, 24-25, pp. 65 at lines 1-4 (October 20, 2015), available via www.acefederal.com. [Hereinafter "Official Transcript" or "Transcript"].

EPSA agrees that the Commission must solve the "missing money" problem[17] by articulating or confirming that the objective design function of the MISO market is to assure the retention of existing economic units and attracting new entry sufficient to maintain reliability. To this end, EPSA requests that the Commission offer direction to frame and structure MISO's efforts[18] to balance its long-term regional concerns with the appropriate market design changes, and dismiss the pending Complaints that would seek premature, narrow and unnecessary Tariff adjustments prior to such design changes.

B. The Commission Should Support Efforts by MISO to Reform Market Design Fundamentals and Use its Authority to Order MISO to Initiate Specific Design Changes if Stakeholder Efforts Do Not Progress Efficiently and Timely.

The MISO technical conference discussions aptly demonstrated that the current rules underpinning the MISO Construct do not align with the fundamental objectives of a capacity market design, and that the Commission must take action to encourage necessary market design changes that will support a well-functioning capacity marketplace in MISO's restructured regions. EPSA is encouraged that MISO announced in its draft Issues Statement ("Statement") that it intends to explore ways in which to address price formation and timing issues that are problematic for incenting resource adequacy in its restructured markets. Given this development, EPSA recommends that the Commission allow MISO and its stakeholders time to develop a solution and, if that process fails to progress in an efficient

[17] *See* Affidavit of Roy D. Shanker, *infra.* at Appendix A, at P 6.

[18] For example, as Dr. Patton noted at the technical conference, a FERC mandate similar to the 2014 order requiring a sloped demand curve in ISO-NE would be an appropriate way to help frame and structure the MISO stakeholder process that follows from the Issues Statement, to implement the fundamentals of capacity market design that the Commission has articulated repeatedly in orders regarding the PJM, ISO-NE and New York capacity markets.

and timely manner, to use its authority to direct implementation of specific design principles that are necessary for well-functioning, robust capacity markets.

EPSA believes this is an important next step that the Commission can take in the near future, without negatively impacting the market participants that participated in the most recent auction or compromising the stability and transparency of the upcoming auction for 2016-2017.

Importantly, EPSA reiterates that the Commission should not take any steps prior to the next PRA or otherwise that would interfere with MISO's intended wholesale examination of how to better design its market construct to ensure long term resource adequacy in restructured markets. EPSA emphasizes that the "quick fixes" posited by some participants at the technical conference – such as elimination of the PJM replacement market as the best measure of opportunity cost and thus serving as the initial reference level for mitigation – do not advance real solutions and would risk creating more uncertainty and volatility for all market participants in the upcoming capacity auction.

As MISO has identified and as EPSA and other panel participants reiterated at the technical conference, there is no silver bullet that will address long-term resource adequacy concerns prior to the next capacity auction unless market design reforms are undertaken to better align the MISO resource adequacy construct with fundamental capacity market design principles that have been articulated by the Commission for the other Eastern RTOs' competitive retail markets. EPSA maintains that ad-hoc implementation of mitigation paradigm alternatives cannot be justified unless and until the Commission were to reach a conclusion in the above-captioned proceedings that any of the elements contested therein with regard to the MISO Tariff and mitigation framework – in isolation of necessary market

design reforms – are unjust and unreasonable and could be modified to produce a just and reasonable outcome as to all market participants that participated in the most recent PRA and that would participate in the upcoming PRA.

C. MISO's Resource Adequacy Stakeholder Process and FERC Should Address Broader Capacity Market Design Issues Prior To, or in Conjunction With, Any Changes Considered for the Capacity Offer Mitigation Paradigm.

The technical conference discussion's critical takeaway with respect to the mitigation questions at issue is that opportunity cost is a principled, well-accepted basis for ascertaining MISO resources' marginal costs to participate in the capacity auction, and that resources should be compensated at the level of this opportunity cost in any circumstance where opportunity cost exceeds going-forward costs. The discussions initiated by Dr. Patton showed in particular that, given the robust presence of several opportunities to export capacity or contract outside of the MISO PRA, opportunity cost calculation by reference to the price signals in the PJM markets is the appropriate, transparent and verifiable basis upon which reference prices in MISO should be established to incent and retain resource participation in the MISO markets. MISO panelists and EPSA's representative Dr. Shanker also affirmed that mitigation design under the MISO Tariff is a function of broader market design realities; in particular, the exogenously developed opportunity cost that reflects PJM export opportunities somewhat relieves the artificial constraints on capacity valuation in MISO that results from its vertical demand curve. EPSA offers some additional insights below as to the importance of pursuing holistic design reform prior to, or in conjunction with, any future examination of the mitigation paradigm in effect pursuant to the current MISO Tariff.

(i) Opportunity Costs Should Remain a Centerpiece of the MISO Mitigation Paradigm as Reflected in the Current Default Reference Level Calculation As There is No Economically Rational Basis to Exclude Opportunity Cost.

EPSA appreciates that staff took the opportunity at the technical conference to explore the specific alternatives that have been proposed in the above-captioned proceedings with regard to the default reference level for MISO capacity offers and the appropriateness of opportunity cost as calculated currently by the MISO IMM pursuant to requirements in the MISO Tariff. EPSA concludes from the discussions and urges the Commission to likewise conclude that there is no economic basis for precluding opportunity cost as an element of potential marginal costs that MISO resources would see when making a rational economic decision to bid into the capacity auction. EPSA also notes that in the staff discussions, no panelists offered a viable alternative to the use of the PJM capacity market in general, and specifically the opportunity cost linked to the continuing ability to "cover" PJM capacity obligations via replacement transactions, to develop the MISO Tariff-mandated measure of opportunity cost.

With these points in mind, EPSA believes it is critical for FERC staff to distill the technical conference discussions regarding the feasibility of various alternatives into two clear categories – alternatives to mitigation that "could" be accomplished, versus those that "should" be carried out. In the former category of what "could" be accomplished, staff posed many questions regarding the MISO reference level, the notion of opportunity cost as a function of export capability to PJM on a replacement basis, and the question of zonal restructuring. It can be concluded beyond doubt that while most (if not all) of these alternatives "could" be accomplished, none "should" be undertaken in isolation of, or prior to, holistic market design reforms. EPSA offers several comments on this point below.

First, it is important to reiterate that all FERC-approved capacity markets use opportunity cost in some fashion to ascertain marginal costs as appropriate. Opportunity cost established on the basis of the marginal opportunity for export is the appropriate metric upon which MISO capacity resource offers should be compensated: as the value of foregone opportunities for exports outside MISO is incontrovertibly higher than going-forward costs for maintain capacity resources in MISO, a rational compensation mechanism designed to incent participation in the MISO auctions must continue to offer MISO resources the value of export opportunities foregone. Per requirements in the MISO Tariff, this value opportunity has been accurately reflected by the MISO IMM in a reference level price that tracks clearing prices in a legitimate, verifiable, and transparently priced adjacent capacity market and adheres to robust analytical and economic principles. As was discussed at length in the conference, while the current solution may fall short of an endogenously developed supply and demand curve that reflects all competitive economic opportunity costs within MISO, it is the *only* transparent and verifiable means with which to ascertain the true value of MISO capacity at the margin. Therefore, FERC should not take action with regard to the Resource Adequacy Construct that would ignore or artificially suppress opportunity costs on a market-wide basis.

Second, EPSA reiterates that an alternative framing of the reference level solely as the "going forward" costs only for specific facilities or groups of facilities would be an impractical and inaccurate representation of foregone opportunity costs. FERC should reject any proposals that would seek to replace a market-wide default price reference with facility-specific reference levels given that the reality of MISO capacity offers is that any given offer faces the same marginal opportunities as any other offer would to take advantage of another opportunity for bilateral contracting, exports to PJM, or exports to another region outside

MISO. The problems of facility-specific reference level development were very clearly elucidated in the discussion among FERC staff, Patton, Shanker, and Bladen in the first session.

For example, Bladen noted with regard to the notion of relying only going-forward unavoidable costs to develop categorical facility/unit-specific reference levels that, by design, this would reduce competition rather than enhance it and "would lead to the outcome where the only place to capture the true opportunity cost was through export, and because the true opportunity cost is in a neighboring system, anybody that wanted to capture that using the curve, I think, would require them to export."[19]

Patton further elaborated that an approach that requires cherry-picking individual resources' marginal costs to arrive at some "curve" reflective of an individual unit's foregone costs is precluded in any case by the existence of a vertical demand curve in MISO. Given the vertical curve, Patton noted that it would be nearly impossible to differentiate marginal cost among such units because the first unit, and the last unit, when faced with the choice of bidding into a neighboring competitive market "will pursue the opportunity to export the capacity for $165 as opposed to being willing to sell close to zero [in MISO]."[20]

Shanker rounded out this discussion with the critical observation that the fundamental purpose of employing an opportunity cost is to inform long-term price formation in the marketplace by correctly placing an economic value on the opportunities that MISO resources have at the margin to sell their capacity resources.[21] Specifically and importantly for MISO capacity, Shanker noted that one of the clear advantages of a reference price

[19] Transcript, at pp. 85-86.

[20] Transcript, at pp. 87 lines 21-25; pp. 88 lines 1-2.

[21] Transcript, at pp. 100 – 101.

reflecting opportunity costs based on PJM markets is that it compensates resources at some level above "zero" and gives shape to the supply curve "to make up for some of the deficiencies in the market" such as the lack of buyer-side mitigation and the volatility introduced from a vertical demand curve. He added that the current default reference price appropriately sends a transparent price signal that is accessible to all market participants and reflects market-wide opportunity in spite of the structural constraints within MISO, because it appropriately references a transparent market price in an adjacent, liquid and viable market where the Commission has itself already recognized an endogenously-developed opportunity cost as the right measure of default offer levels/costs.[22]

Third, EPSA agrees with Patton and Shanker's remarks that given the design flaws in MISO and the need for a reference level to actually reflect a marginal cost at some legitimate level, an alternative reference design based on using Net CONE ("Cost of New Entry") is patently unreasonable. Dr. Patton noted that this alternative is "probably not any more unreasonable" than using only going-forward costs to value opportunities at the margin, and added that the "problem is that you need the reference level or a theory [thereof] [which] dictates that reference level reflects people's marginal costs."[23] Shanker added that the market design in MISO would not permit the reasonable use of Net CONE, even though it is a valuable concept. He explained that it is valuable "when it is coupled with two other attributes" in the capacity market: "One is a downward sloping demand curve and two a feedback mechanism that tends to get the price to oscillate around that reference unit Net

[22] Transcript, at pp. 73.

[23] Transcript, at pp. 107, lines 10 – 13.

CONE. And MISO has neither of those. In the context of what's out there now, this kind of a reference level would be pretty useless."[24]

EPSA agrees with these various comments noted above by Bladen, Patton and Shanker, and reiterates that the current reference level based on the PJM replacement capacity market should be retained as the appropriate framework for valuing opportunity costs as per the MISO Tariff, because this methodology remains the most economically and analytically available and appropriate to provide market-wide price signals to MISO resources, and is properly based on a lost opportunity cost that is legitimate and verifiable through the PJM marketplace.

EPSA further agrees with Patton and Shanker's concurring remarks that the elimination of opportunity costs from the compensation framework for MISO capacity resource offers would effectively suspend economic realities that impact MISO generators' decisions in the present and in the future. EPSA also agrees with Patton's statement that eliminating a default reference level based on opportunity costs compromises the economic theory that the reference level concept is predicated on in the first instance.[25]

(ii) The Commission Should Not Recommend or Require the Combining of MISO Zone 4 with MISO Zone 5 as this Consolidation Would Result in Market Distortions for Independent Power Producers and Lead to Long-Term Investment Decline in MISO's Restructured Markets where More Reliability is Needed.

EPSA believes that both the MISO resource adequacy stakeholder process and the Commission's efforts to support this process must not result in restructured, market-based areas like Zone 4 being collapsed into broader, vertically integrated areas within MISO.

[24] Transcript, at pp. 108, lines 15 – 22.

[25] Transcript, at pp. 97 lines 19-21.

Doing so would be a false start for meaningful reforms supporting well-functioning, transparent and competitive capacity markets and would not result in benefits for MISO stakeholders, generators and consumers.

Combining Zone 4 with Zone 5 poses unique challenges and problems that would ultimately compromise long-term investments in existing and new resources necessary to support reliability in Illinois. As noted by panelist Tia Elliott from NRG at the technical conference, the two zones have very different market structures – Zone 4 is a retail choice state, whereas Zone 5 is a vertically integrated state in which the cost of new generation or investments in existing generation are borne by ratepayers through state-approved fixed rates that pass through such costs on a forward basis.[26] Elliott also stated that "[w]hat ultimately could happen [as a consequence of combining these two zones] is we could end up in a situation where there is a cross subsidization within one large zone if you combine two states that have difference frameworks."[27] EPSA agrees with this observation, and elaborates that as only Zone 4 is restructured on the retail side, there is no ability to designate, build and lock in a future revenue stream related to a given facility as there is for rate-based projects in Zone 5. Comingling Zone 4 and Zone 5 would therefore compromise price signals for Zone 4, such that price signals supporting investment in retaining and upgrading existing facilities *and* new build would migrate outside Zone 4. This outcome would in turn pose a serious long-term reliability threat to Illinois and contradict the Commission's policy requirements that capacity markets utilize zones that support the development of transparent locational price signals

[26] Transcript, at pp. 176 lines 18 – 25.

[27] Transcript, at pp. 177 lines 1 – 4.

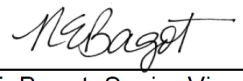
EPSA also urges the Commission to carefully review any proposals submitted by MISO through its resource adequacy process that would recommend changes to zonal boundaries between or among zones that have fundamentally different market structures. The Commission should ensure that MISO's proposals regarding zonal boundary reforms are based on a workable and realistic goal of alleviating transmission limitations or otherwise improving deliverability across current seams and interties that are experiencing constraints – not to dilute price signals or mask larger problems embedded in market design fundamentals. Additionally, such reform proposals should openly analyze any potential consequences that may negatively impact reliability and or the ability of competitive generators to better ensure reliability. As MISO has identified in its recent draft Issues Statement, there is a delicate balance already at play in the restructured states that permits a level of economic participation by MISO generation resources *even though* there is no mechanism to ensure an adequate long-term market price to retain that participation going forward or incent new investments in the region. Conversely, the incentives to sell capacity *outside* MISO in a more transparent capacity market such as PJM are very strong, and could be further strengthened by ill-conceived or hasty changes to the MISO capacity construct.

Fundamentally, the Commission's declarative confirmation of the design objectives of MISO's capacity market construct is an important predicate to consideration of any zonal boundary changes across MISO. To the extent that the objective of the MISO marketplace is to incent better price formation and transparency in the restructured markets and attract new entry, boundary changes in isolation of broader market design reforms will not assist the ISO in meeting this objective. Given that the MISO resource adequacy reform process is now underway to address restructured markets such as Zone 4, the Commission should

support the stakeholder process and ensure that market design issues which enhance reliability are the focus of these reforms.

I. CONCLUSION

WHEREFORE, EPSA submits that specific issues discussed at the FERC technical conference cannot and should not be examined in isolation of necessary reforms to the broader market design in MISO. Commission action on these few issues which would narrowly reform limited MISO Tariff provisions based on the assertions made in the pending MISO Complaints would impede a genuine effort by the Commission, MISO and its stakeholders to develop meaningful reforms necessary to develop the long-term price signals and resource adequacy planning that is needed to enhance and support MISO's competitive retail markets. EPSA therefore requests that the Commission dismiss the Complaints and allow the stakeholder process time to develop a holistic solution to the MISO resource adequacy issues. Should those efforts prove unlikely to yield results in a timely manner, then the Commission should direct the rapid examination and development by MISO of the necessary market design changes which result in appropriate long-term price signals for generators in Zone 4 and surrounding MISO regions.



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Dated November 4, 2015.

CERTIFICATE OF SERVICE

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

Dated at Washington, D.C. this 4th day of November, 2015.

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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Public Citizen, Inc. v. Midcontinent Independent System Operator, Inc.	Docket Nos. EL15-70-000
The People of the State of Illinois, by Illinois Att'y General Lisa Madigan, v. Midcontinent Independent System Operator, Inc.	EL15-71-000
Southwestern Electric Cooperative, Inc. v. Midcontinent Independent System Operator, Inc., Dynegy, Inc., and Sellers of Capacity into Zone 4 of the 2015-2016 MISO Planning Resource Auction	EL15-72-000
Illinois Industrial Energy Consumers v. Midcontinent Independent System Operator, Inc.	EL15-82-000

APPENDIX A

Affidavit of

Roy J. Shanker Ph.D.

1. My name is Roy J. Shanker. My address is P. O. Box 1480, Pebble Beach, California, 93953. I have been retained by the Electric Power Supply Association (EPSA) to supplement comments I made at the Federal Energy Regulatory Commission's ("FERC" or "Commission") October 20, 2015 Technical Conference in the above-captioned dockets.

I. Qualifications and Experience

2. My resume, attached as Exhibit RJS-1, summarizes my experience in numerous regulatory proceedings before the Commission and state commissions. As detailed therein,

I have 40 years of experience covering a broad range of issues in the electric utility industry, and have worked as an independent consultant for the past 34 years. Relevant to the present matter is my experience with the design and development of capacity markets in all of the eastern RTOs, in several cases since the inception of the markets. I began participating in this process in approximately 1995 as PJM and NYISO commenced market design activities related to their becoming independent system operators and subsequently regional transmission organizations ("ISO/RTO"). Specifically for MISO I presented an affidavit to the Commission in Docket No. ER11-4081-000, on behalf of the "Capacity Suppliers" addressing the proposed construct of a MISO capacity market that resulted in the current construct that is in place. I also have testified numerous times on capacity market designs and have been an invited speaker before the Commission on this topic.

3. In the above-captioned dockets I participated as a speaker for EPSA in the Commission's Technical Session on October 20. Specifically I was a speaker on Session One, Panel Two: Alternatives to the Current Mitigation Procedures and Reference Level Calculation.

4. I have a bachelor's degree from Swarthmore College and both master's and doctorate degrees from Carnegie-Mellon University.

II. DISCUSSION

5. In the following I partition my comments into two main areas. First, some general considerations regarding the overall structure of capacity markets that should serve as a context for any actions the Commission may consider in these proceedings; and second, responses to the specific questions that the Commission Staff directed to the panel I participated on. In keeping with the scope of the Commission staff's request for additional information in relation to the technical conference discussion, my comments are abbreviated, building off of previous testimony I have presented to the Commission, and related Commission orders. I believe this is a consistent level of detail for summaries related to the Technical Conference. Should I be asked to comment further in these dockets, I will expand on these and related discussions.

A. Objective Function of the Capacity Market

6. At the highest level, the Commission needs to confirm the objective function of the MISO capacity market. It has been fundamental in PJM, ISO-NE and NYISO that the intent of the market design was to use market type mechanisms to assure that capacity suppliers received sufficient revenues to retain economic existing units and attract new entry sufficient to maintain reliability. It has been repeatedly recognized that energy markets alone do not provide sufficient net revenues to accomplish this objective due to mandated reliability standards that assure excess generation supplies, in all but the most extreme conditions, and also within markets where energy offers and resulting prices, are capped. The resolution of the "missing money" problem has been to design capacity markets that can supplement energy margins and accomplish this objective. It is hard to imagine a viable capacity market design, particularly paired with the existence of competitive retail access, which does not share and offer the ability to achieve this objective.

7. In a previous affidavit to the Commission,[28] I offered comments regarding the MISO design and PRA process. I was critical of a number of features that MISO proposed. But never in the entirety of Docket No. ER11-4081 was the view expressed by the Commission that the MISO design did not share this basic objective.

8. A corollary of this objective function, as discussed on numerous occasions before the Commission, is the expectation that on average, and over time, a capacity resource will have the opportunity to earn capacity revenues approximated by the net costs of new entry. So somewhere, embedded in the market design, there must be a logical structure that supports this expectation, and similarly the associated objective function. While I am not sure that the existing MISO design actually can achieve this goal, it is obvious that a key element in

[28] Affidavit and Exhibit of Roy Shanker on Behalf of Capacity Suppliers, *Midwest Independent Transmission System Operator, Inc*., Docket No .ER11-4081-000 (September 15, 2011), at 3 ("The normal core objectives of any capacity market construct are to support market-based entry, retain economic existing entry, and send appropriate, non-discriminatory locational price signals to both suppliers and load. If these were MISO's objectives (and MISO states that they were), then the proposal fails miserably. At almost every turn, the MISO proposal contains elements that undermine the ability of the proposed capacity construct to accomplish its core objectives. Its flaws will result in inefficient and incorrect capacity prices, thus sending the wrong signals about retaining economic existing capacity and attracting new entry."). [Shanker Affidavit, Capacity Suppliers 2011].

approximating any market-like result that approaches the necessary "missing money" is the use of opportunity costs as an initial reference price for offers. At minimum, this allows the MISO supply curve in a well-justified manner to "lean" on market based results in an adjacent region that explicitly is intended to achieve the desired objective.

B. Need for a Holistic View of Capacity Market Design

9. A second general principle that is important in the context of all of the mitigation related questions raised by the Commission during the Technical Conference is that it has to be recognized that a proper analysis of mitigation has to occur in the context of the entire market design taken as a whole. While there might be several design elements that can be considered independently, this would be the exception, not the rule. Mitigation is clearly an element that must be tied to the overall capacity market design. It has to complement the basic objective discussed above, and be consistent with offer obligations and other market design components.

10. Perhaps the best examples of this integrated type of adjustment are the recent Commission approved changes to the ISO-NE (pay for performance) and PJM (capacity performance) capacity market designs. A wide range of market elements were adjusted simultaneous, and hopefully on a complementary basis. The basic notions of performance and obligations for capacity resources were changed, as were performance related penalties. In the PJM market, this was also coupled with a recent adjustment to the Variable Resource Requirement Curve (downward sloping demand curve),[29] and in ISO-NE the recent addition of a downward sloping demand curve.[30] Importantly, a major element in each of these two recent design changes was the creation of a new definition for a default offer cap based on an endogenously-defined opportunity cost (the use of the product of the "balancing ratio times net cone" (B x Net Cone). This not only confirms the opportunity cost notion for mitigation pricing has been vetted by the Commission elsewhere (as well as the MISO Tariff), but shows the range of the associated details linked to the rest of the overall market design.

[29] Citation to be added: FERC Order re; variable resource requirement curve

[30] Citation: New England Order(s) re: Sloped Curve for FCAs [potential cite to zonal curves orders/dockets?\

11. I would strongly urge the Commission not to pursue a "cherry picking" type of approach in response to concerns raised regarding mitigation based on opportunity costs under the existing MISO capacity market design. Not only is this a theoretically correct approach that matches basic economics, but it also complements some of the limitations in the current MISO design. Similarly our collective experiences strongly suggest that "one off" adjustments are sure to have unintended consequences based on interactions with other market elements not being considered thus far either in the overall proceeding or within the scope of the Technical Conference discussions.

12. The recent MISO draft Issue Paper [31] emphasizes the importance of this recommendation to not pursue "one off" adjustments. As cited extensively in the accompanying EPSA Comments above,[32] the Issue Paper makes clear that: (i) MISO understands the integrated nature of capacity market design with multiple market elements; and (ii) MISO's intent is to address a collective set of adjustments for capacity markets working in a retail access environment. Together, this means that it is likely that a range of design elements will be considered and potentially changed. In turn, it may be that detailed elements of mitigation will also be adjusted.

C. Marginal Costs, Opportunity Costs, and Mitigation

13. At a very high level, the fundamental economic principle driving *rational* bidding behavior is considered to be the linkage of such behavior with some consistently ascertainable metric of avoided or marginal costs. Parties seek to gain additional revenue so long as it exceeds their marginal cost (inclusive of opportunity costs). This concept is also linked to default reference levels and mitigation. In seeking a general approach to mitigation (or identifying where mitigation is not needed), the basic building block is the determination of a competitive offer.[33]

[31] Issues Statement (Draft), Resource Adequacy in Restructured Competitive Retail Markets, MISO Staff (October 2015).

[32] Comments of the Electric Power Supply Association In Response to Notice of Technical Conference, Docket Nos. EL-15-70-000 et al. (filed Nov. 4, 2015).

[33] See E.g. Docket No. AD14-14-000, Staff Analysis of Energy Offer Mitigation in RTO and ISO Markets October 2014 (stating that "[c]entral to well-functioning market power mitigation, as currently used by the RTOs and ISOs, is the measurement of marginal cost. The mitigation rules employed by the RTOs and ISOs are designed to ensure that resources are able to bid their marginal costs, but are not able to exercise market

14. As I have noted in the above section, the details of that "linkage" are connected to the details of the market design. But in no fashion is there any economic basis for precluding opportunity cost as an element of potential marginal costs. A rational offer reflecting trade-offs at the margin must consider opportunity costs. Further, on a non-discriminatory basis, all eligible units are similarly positioned and should see the same opportunity cost. All units are similarly situated at the margin, and this is part of the underlying logic that the Commission has continually relied on with respect to the use of a single clearing price in market design for both energy and capacity [34]

15. Indeed, the PJM and ISO-NE examples cited above use as default offer caps (i.e. offers presumed to be competitive without further evaluation) values that are explicitly intended to represent the opportunity costs seen by a potential capacity supplier. The Commission accepted this opportunity cost representation as the basis for default capacity offers (e.g. presumed competitive) in both markets.[35]

16. The obvious choice for the Tariff mandated use of opportunity cost is the PJM capacity market in general and specifically the opportunity cost linked to the continuing ability to "cover" PJM capacity obligations via replacement transactions supported by MISO capacity. Significant amounts of MISO capacity is already sold on a firm basis to PJM and linked via pseudo tie to the system. As noted by Dr. Patton during the Technical Session (cite to slides) there is also the ability to "move" additional capacity between MISO and PJM based on available firm transmission that supports only energy transactions. Further, and most importantly is the fact that at the margin, the PJM replacement market is the opportunity cost faced by MISO capacity when choosing to obligate themselves into the MISO market or remain available to pursue this marginal opportunity.

17. At a more detailed level in MISO in terms of the overall capacity market, my conclusion is the use of opportunity costs as an initial reference value is actually one of the stronger

power." Page 1. The Staff paper focuses on energy offers, but the principal of seeking competitive offers at marginal cost inclusive of opportunity cost is shared in both energy and capacity markets.

[34] This point was elucidated also at the FERC staff Technical Conference on October 20, 2015, by the MISO Independent Market Monitor, David Patton. *See* Official Transcript, at pp. 87 lines 21-25; pp. 88 lines 1-2; *see also*, Shanker Affidavit, Capacity Suppliers 2011, *supra.* note 28.

[3535] Reference citations previously noted for PJM and ISO NE FERC orders on capacity markets.

elements in the current flawed overall capacity market design. In the absence of a demand curve, it is important for price formation for there to be some "shape" to the supply curve should there be competitive opportunities for the sale of the supply (ideally there is information carried in both the supply and demand curves). Typically this can be accomplished by having a forward market where the supply curve can at least express the cost of new entry during scarcity, consistent with a time step that allows new capacity to be built. But MISO has neither a demand curve nor a true forward market, with the PRA coming only two months prior to the delivery year.

18. In the context of MISO's current market design with its vertical demand curve, one would expect a boom-bust cycle that values capacity at near zero during periods of surplus and whatever default cap is applied during shortage.[36] And for the most part that is what MISO recently experienced. But by allowing the legitimate representation of opportunity costs based on replacement value in PJM, the MISO design at least allows some "shape" to the supply curve based on the ability to "cover" via replacement supplies/sales in an adjacent market (and a market that presumably approximates over time the principle objective stated above). While still inferior to a structure that would also allow the expression of meaningful supply and demand curves, the mandated reference price that properly displays opportunity costs is better than artificially ignoring these opportunity costs. Yet, my observation during the Technical Conference was that all of the suggestions to seek unit specific type marginal costs are asking for the opportunity costs to be ignored. When presented with a variant of this logic regarding ignoring opportunity costs and only looking at unit specific marginal costs, Dr. Patton summarized my exact thoughts:

"Dr. Patton: The answer is no. Effectively what you are asking is to sort of suspend economic theory in determining the reference level and the reference level is predicated on economic theory."[37]

18. The Commission shouldn't be pushed into an incorrect solution to solve a problem that doesn't exist. Again, ad hoc "adjustments" of single design elements without

[36] Shanker Affidavit, Capacity Suppliers Group 2011, *supra* note 28, at 54.

[37] *See* Transcript, page 97 lines 18-21.

consideration of the overall consequences and consistency of the market design is simply an invitation for failure, and in this case seems motivated primarily by a desire to suppress reasonable market pricing results (see following section).

19. Another benefit of the use of the opportunity costs as a reference price is that it creates a much more level playing field for price negotiations in the bilateral market. Given the concentration of buyers as well as sellers, this is also an important mitigation consideration given the flaws in the MISO market design. (As noted in the EPSA comments, MISO seems to have recognized many of the design problems inherent in my comments, and is seeking to initiate a stakeholder process to review capacity market design in areas with competitive retail access.

D. Reasonableness of Zone 4 Prices

20. I believe that the MISO Independent Market Monitor, Dr. David Patton, has succinctly summarized the general criticisms regarding the notion that Zone 4 prices were somehow artificially high, when he commented at the Technical Conference that the real problem seemed to be that the rest of the market was priced far too low.[38] It is simply not sustainable to argue that prices that are approximately 1-2% of the estimated CONE value of $243 per MW/day are reasonable. Neither can it be reasonably expected that this level of compensation can retain existing supply and attract new supply in a competitive environment such as Zone 4 where there are no out-of-market payments to support supply. It is only the existence of vertical integration in the rest of MISO, and the associated embedded cost recovery for capital investments, that allows these absurdly low prices to persist. The notion that they are representative of what prices "should" be is very troubling.[39]

[38] Transcript Citation: Dr. Patton's remarks, Oct. 20, 2015.

[39] *See* Order on Resource Adequacy Proposal, *Midwest Independent Transmission System Operator, Inc.*, 139 FERC ¶ 61,199 (June 11, 2012), at P 66, P 187 (wherein the Commission noted that several parties argued that the price signals associated with a one year auction would not be sufficient for generation developers to engage in the planning, financing and construction of needed generation, thereby harming long-term reliability. However, the Commission determined that MISO's auction framework was reasonable and added that: "Under MISO's resource plan framework, most LSEs will continue to obtain most – if not all – of their supplies outside the auction. This framework has not resulted in a resource deficit nor has it reduced the availability of resources in the MISO region and therefore we have no basis for assuming that a longer auction term is needed to ensure resource sufficiency". The Commission also noted that: "Buyers within MISO are generally unlikely to benefit from exercising market power by subsidizing uneconomic entry and the resulting reduction in capacity prices in MISO's voluntary capacity market. That is because, as American Public Power

21. The scale of distortion from a comparison to PRA values in vertically integrated regions is displayed by the analyses submitted by Dynegy in Mr. Jones' affidavit where he concluded that the average embedded capacity recovery by these companies was $308 per MW day.[40] I have seen similar methodologies used by vertically integrated companies yielding similar results that have been presented to the Commission representing embedded capacity costs, *e.g.* $387 per MW day.[41]

E. Consistency of Opportunity Costs with Tariff Requirements

22. The observations above demonstrate the appropriateness of the use of opportunity costs in setting marginal costs, and as a reasonable reference level. But there is also a straightforward obligation to proceed as the MISO Independent Market Monitor did, directly from the Tariff in section 64.1.4 (e):

> **e.** Initial Reference Levels for Zonal Resource Credit Offers will be based on the estimated opportunity cost of exporting capacity to a neighboring region.
>
> "i. The IMM shall estimate the Reference Level for Planning Resources based upon best available Capacity pricing data from neighboring regions, available

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Association and the Organization of MISO States note, utilities own the vast majority of capacity within MISO. ***These utilities would not significantly benefit from lower prices in MISO's voluntary capacity market*** because the utilities do not need to procure a significant amount of capacity from MISO's capacity market. Inasmuch as we are eliminating the mandatory auction feature of the MISO proposal, as discussed above, the potential for utilities to benefit from lower prices in the auction is even less likely.") (emphasis added).

[40] Affidavit of Henry Jones, Answer of Dynegy Inc., Dynegy Marketing and Trade, LLC, and Illinois Power Marketing Company to Complaint, *Midcontinent Independent System Operator Inc., Dynegy, Inc., and Sellers of Capacity into Zone 4 of the 2015-2016 MISO Planning Resource Auction*, Docket Nos. EL-71-000; EL15-72-000 (consolidation pending) (filed July 2, 2015). Note: This methodology used by Mr. Hank Jones is similar to what I have seen proposed for embedded cost recovery by utilities seeking embedded cost payments related to capacity. *See also, infra.* note 39.

[41] *See, e.g.,* the November 1, 2010 filing letter at the Commission by AEP for recovery of capacity related payments under its FRR plan. AEP PJM FRR Capacity Compensation Calculation Filing, Docket No.ER11-2183-000 (filed Nov. 1, 2010)("On behalf of Columbus Southern Power Company ("CSP") and Ohio Power Company("OPCo") (collectively, the "AEP Ohio Companies"), American Electric Power Service Corporation ("AEP") herewith tenders for filing, pursuant to Sections 35.1 and 35.13 of the Commission's Regulations, 18 C.F.R. §§ 35.1 and .13 (2010), formula rate templates under which each of the AEP Ohio Companies will calculate their respective capacity costs ("Capacity Compensation Formulas") under Section D of the PJM Interconnection, L.L.C. ("PJM") Reliability Assurance Agreement ("RAA"). (page 1)…Rate Schedule No. 101, Page 1 of the OPCo Capacity Compensation Formula shows the hourly capacity charge, and Page 2 shows that the charge is derived by dividing the annual production fixed cost divided by OPCo's average 5-CP/365." (page 4) . Note that the resulting embedded cost based rates were $387.77897 (see populated Rate Schedule for 2009, at Attachment A, pp. 2.)

bilateral Capacity contract information and the results of voluntary capacity auctions.

ii. Thirty (30) days prior to the deadline for submitting offers into each RAR voluntary capacity auction, the IMM will publicly post the applicable Reference Level for Planning Resources. This shall include a complete enumeration of the information used and the derivation of the opportunity costs included in the Reference Level."

23. Dr. Patton has previously explained exactly how he proceeded to implement this provision, and the resultant estimate of opportunity costs based on the marginal ability to sell replacement capacity into the PJM markets. I am sure he will offer similar comments again. Importantly, he has stated that: (i) he believes that the opportunity cost serves as a valid reference level in mitigation; (ii) this is the same methodology used for several years to support the PRA, and (iii) he has solicited other information about potential opportunity costs from market participants, and no acceptable information has been offered. Further, this value is totally transparent to the entire marketplace, and offers a readily calculated standard for all market participants. So, not only is the opportunity cost conceptually valid, but the empirical implementation reflecting the marginal opportunity that continually exists to sell replacement capacity into PJM appears to be the best current data available, and its use is dictated by the Tariff. I therefore concur with Dr. Patton that given these observations, the opportunity cost of replacement transactions remains the appropriate (and also the only empirically practical) reference level.

F. Combining or Compressing Existing Capacity Zones

24. Part of the discussion at the Technical Conference raised the issue of combining two Local Resource Zones, e.g. MISO Zones 4 and 5. This is the equivalent to removing constraints requiring local clearing requirements (LCRs) for each zone, and pretending that such LCR's no longer are valid or can bind. This type of proposal, masking or ignoring constraints in order to suppress prices, has been raised numerous times in the past. As always, the obvious answer to such proposals should be "no". It is a wrong-headed strategy

that can only distort/suppress pricing, remove important pricing information from the market, and ignore important reliability requirements.

25. In responses that MISO recently provided to the Illinois Commission they explained that there was nothing atypical about the in zone local clearing requirement for Zone 4,[42] MISO determines internal needs in an LCR based on load and generation in the LCR and the ability to import into the LCR. In its specific response,[43] MISO stated:

> 4. Why must the zonal capacity requirement only be met by resources located within the zone? Is the electrical grid not also supported by resources in areas that neighbor Zone 4, such as Missouri, Iowa, and Indiana?
>
> *MISO Response*: There is not a requirement that all capacity for a zone must come from resources located within that zone. Resources located both inside and outside of Zone 4 were used to meet the total capacity requirements for the zone. Zone 4 was able to import 1,568 megawatts of lower cost capacity from other zones. The balance of the capacity for the zone needed to come from resources internal to Zone 4 (the Local Clearing Requirement). The Local Clearing Requirement is determined through an annual study that MISO conducts to establish regional and local reliability needs. The outcome of the study for the 2015-2016 planning year determined that Zone 4 needed at least 85% of its capacity from resources within the zone. The value is comparable to the average of all other zones (87%), and is lower than 6 others zones, which required local procurement of 87% or higher.

26. If the potential exists for an LCR to bind in terms of having sufficient local generation and/or having/exceeding capacity limited imports (CIL), the zonal definitions and associated CIL and LCR should be maintained. If the constraints bind, they bind, and convey necessary price and reliability information. However, if there are sufficient local resources and transfer capability such that these constraints do not bind, than a uniform price would result, exactly the same as if the zones were combined. In other words, you keep the constraints always, whether they bind or not. There is no downside to maintaining the current zones (or smaller

[42] April 24, 2015 Letter from Kari Bennett (MISO Counsel) to Cara Hendrickson, State of Illinois Office of Attorney General.

[43] *See* Letter Dated April 24, 2015, Results of MISO's Third Annual Planning Resource Auction, available online via the MISO website at: http://www.rtoinsider.com/wp-content/uploads/MISO-response-to-IL-OAG-4-24-15.pdf.

if justified) as the related constraint only impact price formation when it has to, otherwise pricing is the same as if the constraint didn't exist.

G. Empirical Results Validate Criticism and Demonstrate Long-Term Migration of Suppliers Out of the Market.

27. There are several obvious empirical results that the Commission needs to consider in combination when reviewing the reference price issue if the MISO overall and Zone 4 capacity market design remains the same. First, as widely predicted, the combination of short lead-time and no demand curve will continue to result in highly volatile prices. Second, new merchant supply simply will not locate in MISO unless it somehow receives out of market payments or subsidies, and this will likely will continue to put pressure on reserves in MISO, likely forcing out of market actions for new supply and/or transmission. The realized prices, even from the most recent auction are well below any estimates of new entry cost requirements in MISO[44] Third, despite what has been criticized as "high" pricing for Zone 4, the only locality with retail access, supply internal to MISO appears to be continuing to vote with its feet by selling into PJM. For the most recent auction (2018-19) capacity exports from MISO to PJM rose to 3522 MW UCAP (approximately 3700 ICAP) and offers, which had to demonstrate deliverability arrangements and willingness to enter into long-term commitments to PJM were at 3962 MW UCAP (approximately 4200 MW ICAP).[45]

H. Panel Questions

28. For session 1 panel 2, the Commission Staff asked the following questions. Where not addressed above, I have provided short answers.

(i) How should opportunity cost underlying reference levels consider physical or economic limitations of capacity sales?

[44] The CONE estimate for Zone 4MISO was $247 per MW day. Testimony provided in this docket suggests that net CONE values are for Zone 4 of approximately $184 per MW day. (See Answer of Dynegy Inc. to Complaints, *Midcontinent Independent System Operator, Inc.*, Docket Nos. EL15-70-000 et al. (filed July 6, 2015) at Exhibit B, page 28, Affidavit of Susan Pope.)

[45] *See* 2018/2019 RPM Base Residual Auction Results, PJM Report, available via PJM website, at p. 9: http://www.pjm.com/~/media/markets-ops/rpm/rpm-auction-info/2018-2019-base-residual-auction-report.ashx

The definition of opportunity costs has to incorporate physical limitations, as that establishes the feasible set of "opportunities". However, if feasible in any amount, the economic characteristics become the basis for defining the opportunity cost. As stated above, and repeatedly mentioned at the Technical Session, given an available option to sell and related opportunity cost, this sets the marginal opportunity cost for all supply. In this case the appropriate reference is the opportunity to make replacement capacity sales into PJM. This reflects the best feasible opportunity identified by any party, inclusive of the Independent Market Monitor. As noted by the IMM, he has sought credible alternatives (presumably indicative of *higher* opportunity costs) for several years and has not been able to identify any.

(ii) Should individual reference levels be developed for market participants that are pivotal suppliers in the capacity market? If so, how should they be determined?

No. The definition of a reference price remains the same regardless of whether any individual unit or supplier is pivotal. The objective of a reference level is to define what offer is "competitive", which makes the notion of being pivotal moot. Competitive is competitive. This is inclusive of the notion of opportunity costs as an initial reference level for all suppliers. The only time that an available opportunity cost would not be appropriate is when the opportunity cost is less than the unit specific marginal cost. To the extent that a unit can demonstrate going forward costs in excess of the initial reference level, provision is made for a unit specific reference level, but again that is part of defining what is competitive for that unit, and does not depend on whether the unit is pivotal or not.

iii) What are alternatives to PJM replacement capacity sales for determining the opportunity costs used to establish mitigation reference levels?

In compliance with 64.1.4 (e) the Market Monitor should be looking at capacity pricing data from neighboring regions, available bilateral capacity contract information and the results of voluntary capacity auctions. From his comments, it appears that the Market Monitor has and continues to review this information in seeking the highest value opportunity costs. The technical session deliberations did not lead to an alternative conclusion or new findings in this regard: the set of basic options remains as identified in the tariff, the best opportunity as demonstrated by the PJM market, transparent bilateral transactions and appropriately defined and conducted auctions.

What should be emphasized is that defaulting to unit specific marginal costs that are below a rational available opportunity cost is incorrect. Much of the discussion at the technical conference seemed to focus on the potential to justify unit specific going forward costs regardless of opportunity costs. This is conceptually wrong, as was strongly emphasized by the Independent Market Monitor, and can only be justified by ignoring fundamentals of the basic economics.[46]

29. This concludes my affidavit.

STATEMENT OF CERTIFICATION

Pursuant to 28 U.S.C. § 1746; Pub. L. 94-550 § 1(a), and 18 C.F.R. § 385.2005(b)(3), I certify under penalty of perjury that the foregoing is true and correct.

Executed on the 4th of November, 2015.

Roy D. Shanker, Ph.D.

P. O. Box 1480, Pebble Beach, California, 93953

[46] Patton Citation from Transcript – re: economic principles would be effectively wiped out re: reference level if one were to do this (as quoted in EPSA comments as well).

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Public Citizen, Inc. v. Midcontinent Independent System Operator, Inc.	Docket Nos. EL15-70-000
The People of the State of Illinois, by Illinois Att'y General Lisa Madigan, Midcontinent Independent System Operator, Inc.	EL15-71-000
Southwestern Electric Cooperative, Inc. v. Midcontinent Independent System Operator, Inc., Dynegy, Inc., and Sellers of Capacity into Zone 4 of the 2015-2016 MISO Planning Resource Auction	EL15-72-000
Illinois Industrial Energy Consumers v. Midcontinent Independent System Operator, Inc.	EL15-82-000
Midcontinent Independent System Operator, Inc.	

APPENDIX A

AFFIDAVIT OF ROY J. SHANKER PH.D

Attachment RSJ – 1

Qualifications of Roy J. Shanker

Attachment RJS – 1

DR. ROY J. SHANKER

QUALIFICATIONS AND EXPERIENCE

EDUCATION:

Swarthmore College, Swarthmore, PA

A.B., Physics, 1970

Carnegie-Mellon University, Pittsburgh, PA

Graduate School of Industrial Administration

MSIA Industrial Administration, 1972

Ph.D., Industrial Administration, 1975

Doctoral research in the development of new non-parametric multivariate techniques for data analysis, with applications in business, marketing and finance.

EXPERIENCE:

1981 - Present

Independent Consultant

P.O. Box 1480

Pebble Beach, CA 93953

Providing management and economic consulting services in

natural resource-related industries, primarily electric

and natural gas utilities.

1979-81 Hagler, Bailly & Company

2301 M Street, N.W.

Washington, D.C.

Principal and a founding partner of the firm; director of electric utility practice area. The firm conducted economic, financial, and technical management consulting analyses in the natural resource area.

1976-79 Resource Planning Associates, Inc.

1901 L Street, N.W.

Washington, D.C.

Principal of the firm; management consultant on resource problems, director of the Washington, D.C. utility practice. Direct supervisor of approximately 20 people.

1973-76 Institute for Defense Analysis

Professional Staff

400 Army-Navy Drive

Arlington, VA

Member of 25 person doctoral level research staff

conducting economic and operations research analyses of military and resource problems.

RELEVANT EXPERIENCE:

2015

234-On behalf of the Electric Power Supply Associaton. Federal Energy Regulatory Commission Dockets EL15-70, 71, 72, 82. Discussant in technical session addressing the establishment of opportunity costs as the basis for capacity reference pricing in the MISO Planning Resource Auctions.

233-On behalf of Dominion Virginia Power. Federal Energy Regulatory Commission Docket ER15-1966. Affidavit regarding changing economic incentives for suppliers associated with the modification of PJM's calculation of Lost Opportunity Costs.

232-On behalf of "Indicated Suppliers" Federal Energy Regulatory Commission Docket No. EL15-64-000. Testimony addressing the appropriateness of proposed changes to the NYISO buyer side mitigation exemptions.

231-On behalf of Hydro Quebec, Energy Services U.S. Federal Energy Regulatory Commission Docket No. ER15-623. Affidavit addressing the consistent treatment of energy imports under PJM's Capacity Performance proposal.

230-Before the Supreme Court of the United States, No. 14-995, On Petition for a Writ of Certiorari to the United States Court of Appeals for the Third Circuit. Brief of electrical engineers, scientists and economists as amici curiae in support of petitioners. Metropolitan Edison et. al. versus Pennsylvania Public Utility Commission et. al.
http://www.americanbar.org/content/dam/aba/publications/supreme_court_preview/briefs_2015_2016/14-840_Borlick_et_al.pdf

2014

229-On behalf of Benton County Wind Farm. United States District Court Southern District of Indiana, Indianapolis Division, Civil Action No. 1:13-cv-1984-SEB-TAB. Expert Reports addressing custom and practice in electric power purchase agreements.

228-On behalf of FirstEnergy Services. FERC Docket EL14-55. Affidavit related to the appropriate characterization of Demand Response in Capacity Markets reflecting performance as the reduction of retail energy consumption.

227)-Federal Energy Regulatory Commission. Docket RM10-17. On my own behalf, a statement regarding the ability of the PJM capacity and energy markets to clear in the transition from any determination that demand response would be excluded jurisdictionally from wholesale markets. This could in turn result in a more appropriate representation of retail demand response.

226) Illinois Commerce Commission. Matter: No. 13-0657. On behalf of Commonwealth Edison Company. Testimony regarding the operation of the PJM regional transmission expansion planning process in general and particularly with regards to the preservation of long-term transmission rights (Stage 1A Auction Revenue Rights), and the consequences that occur when such mandated rights are infeasible.

225-Federal Energy Regulatory Commission. Docket ER14-1579. On behalf of H-P Energy. Affidavit explaining importance of property rights and associated contracts within the PJM transmission planning process, particularly as they pertain to Upgrade Construction Service Agreements.

2013

224-Federal Energy Regulatory Commission. Docket No. ER14-456. On behalf of NextEra Energy to analyze a proposed modification to the PJM Tariff allowing for “easily resolved constraints” to be address by transmission upgrades without any analyses of benefits.

223-Federal Energy Regulatory Commission. Docket No. ER14-504. Affidavit on behalf of PJM Power Producers addressing the interaction between the PJM adequacy planning processes and the formulation of saturation constraints on Limited and Extended Summer Demand Response products.

222-Federal Energy Regulatory Commission. Docket AD13-7. Invited speaker on the Commission’s technical session regarding capacity markets in RTO’s. Comments addressed basic principles of market design, market features, and consequences of market failures and deviations from design principles.

221-Federal Energy Regulatory Commission. Docket No. EL13-62 on behalf of TC Ravenswood LLC. Two affidavits addressing the treatment of reliability support services agreements and associated capacity in the NYISO capacity market design.

2012

220-Federal Energy Regulatory Commission. Docket No. ER12-715-003. On behalf of First Energy Services Company. An affidavit and testimony addressing the appropriateness of the application of a proposed new MISO tariff provision after the fact to a withdrawing MISO member.

219-Federal Energy Regulatory Commission. Docket ER13-335. On behalf of Hydro Quebec U.S. Affidavit addressing appropriate application of ISO-NE Market Rule 1/ Tariff with respect to the qualification of new external capacity to participate in the Forward Capacity Market.

218-Federal Energy Regulatory Commission. Docket IN12-4. On behalf of 220-Deutsche Bank Energy Trading. Affidavit regarding a review of specific transactions, related congestion revenue rights, and deficiencies in CAISO tariff implementation during periods when market software produces multiple feasible pricing solutions.

217-Federal Energy Regulatory Commission. Docket No. ER12-715-003. On behalf of FirstEnergy Services Company. Affidavit regarding implementation of the MISO Tariff with respect to the determination of appropriate exit fees and charges related to certain transmission facilities.

216-Federal Energy Regulatory Commission. Docket No. IN12-11. On behalf of Rumford Paper Company. Affidavit regarding free riding behavior in the design of demand response programs, and its relationship to accusations of market manipulation.

215-Federal Energy Regulatory Commission. Docket No. IN12-10. On behalf of Lincoln Paper and Tissue LLC. Affidavit regarding relationship of demand response behavior and value established in Order 745 to claimed market impacts associated with accusations of market manipulation.

214-Federal Energy Regulatory Commission. Docket No. AD12-16-000. On behalf of PJM Power Providers, testimony regarding deliverability of capacity between the MISO and PJM RTO's and associated basic adequacy planning concepts.

213-United States Court Of Appeals, District of Columbia Circuit. Electric Power Supply Asociation, et al (Petitioners) v. Federal Energy Regulatory Commission et al (Respondents) Nos. 11-1486. Amici Curiae brief regarding the appropriate pricing of demand reduction services in wholesale markets vis a vis the FERC determinations in Order 745.

212-United States Supreme Court. Metropolitan Edison Company and Pennsyvalnia (sic) electric Company (Petitioners), Pennsylvania Public Utility Commission (Respondent) (No. 12-4) Amici Curiae brief regarding the nature of physical losses in electric transmission and relationship to proper marginal cost pricing of electric power and the marginal cost of transmission service.

2011

211-Federal Energy Regulatory Commission Docket No. ER12-513-000. On behalf of PJM Power Providers, testimony regarding the establishment of system wide values for the net cost of new entry related to modifications of the Reliability Planning Model.

210-Federal Energy Regulatory Commission Docket No. EL11-56-000, on behalf of First Energy Services. Affidavit regarding the appropriateness of proposed transmission cost allocation of Multi-Value Projects to an exiting member of the Midwest Independent System Operator.

209-Federal Energy Regulatory Commission Docket No. ER11-4081-000, on behalf of "Capacity Suppliers". Affidavit addressing correct market design elements for Midwest Independent System Operator proposed resource adequacy market.

208-Public Utility Commission of Ohio, Case Nos. 11-346-EL-SSO,11-348-EL-SSO,Nos. 11-349-EL-AAM, 11-350-EL-AAM, on behalf of First Energy Services. Testimony regarding the interaction between the capacity default rates for retail access under the PJM Fixed Resource Requirement and the PJM Reliability Planning Model valuations.

207-Federal Energy Regulatory Commission Dockets No. ER11-2875, EL11-20, Staff Technical Conference on behalf of PJM Power Providers, addressing self supply and the Fixed Resource Requirement elements of PJM's capacity market design.

206-New Jersey Board of Public Utilities, Docket Number EO11050309 on behalf of PSEG Companies. Affidavit addressing the implications of markets and market design elements, and regulatory actions on the relative risk and trade-offs between capital versus energy intensive generation investments.

205-Federal Energy Regulatory Commission Docket No. ER11-2875. Affidavit and supplemental statement on behalf of PJM Power Providers addressing flaws in the PJM tariff's Minimum Offer Price Rule regarding new capacity entry and recommendations for tariff revisions.

204-Federal Energy Regulatory Commission Docket No. EL11-20. Affidavit on behalf of PJM Power Providers addressing flaws in the PJM tariff's Minimum Offer Price Rule regarding new capacity entry.

203-Federal Energy Regulatory Commission Docket Nos. ER04-449. Affidavit and supplemental statement on behalf of New York Suppliers addressing the appropriate criteria for the establishment of a new capacity zone in the NYISO markets.

2010

202-New Jersey State Assembly and Senate. Statements on behalf of the Competitive Supplier Coalition addressing market power and reliability impacts of proposed legislation, Assembly Bill 3442 and Senate Bill 2381.

201-Federal Energy Reglatory Commission. Docket ER11-2183. Affidavit on behalf of First Energy Services Company addressing default capacity charges for Fixed Resource Requirement participants in the PJM Reliability Pricing Model capacity market design.

200-Federal Energy Regulatory Commission. Docket ER11-2059Affidavit on behalf of First Energy Services Company addressing deficiencies and computational problems in the proposed "exit charges" for transmission owners leaving the MISO RTO related to long term transmission rights.

199-Federal Energy Regulatory Commission Docket RM10-17. Invited panelist addressing metrics for cost effectiveness of demand response and associated cost allocations and implications for monopsony power.

198-Federal Energy Regualtory (sic) Commission Consolidated Dockets ER10-787-000, EL10-50-000, and EL10-57-000. Two affidavits on behalf of the New England Power Generators Association regarding ISO-NE modified proposals for alternative price rule mitigation and zonal definitions/functions of locational capacity markets.

197-Federal Energy Regulatory Commission Docket No. ER10-2220-000. Affidavit on behalf of the Independent Energy Producers of New York. Addressing rest of state mitigation thresholds and procedures for adjusting thresholds for frequently mitigated units and reliability must run units.

196-Federal Energy Regulatory Commission Docket PA10-1. Affidavit on behalf of Entergy Services related to development of security constrained unit commitment software and its performance.

195-Federal Energy Regulatory Commission Docket No. ER09-1063-004. Testimony on behalf of the PJM Power Providers Group (P3) regarding the proposed shortage pricing mechanism to be implemented in the PJM energy market. Reply comments related to a similar proposal by the independent market monitor.

194-PJM RTO. Statement regarding the impact of the exercise of buyer market power in the PJM RPM/Capacity market. Panel discussant on the issue at the associated Long Term Capacity Market Issues Sympossium. (sic)

193-Federal Energy Regulatory Commission Docket No. ER10-787-000. Affidavit on behalf of New England Power Generators Association addressing proper design of the alternative price rules (APR) for the ISO-NE Forward Capacity Auctions. Second affidavit offered in reply. Supplemental affidavit also submitted

192-Federal Energy Regulatory Commission Docket No. RM10-17-000. Affidavit on behalf of New England Power Generators Association addressing proper pricing for demand response compensation in organized wholesale regional transmissiom (sic) organizations.

191-Federal Energy Regulatory Commission Docket No. RM10-17-000, Affidavit on my on behalf regarding inconsistent representations made between filings in this docket and contemporaneous materials presented in the PJM stakeholder process.

2009

190-Federal Energy Regulatory Commission Docket No. ER09-1682. Two affidavits on behalf of an un-named party regarding confidential treatment of market data coupled with specific market participant bidding, and associated issues.

189-American Arbitration Assoication, Case No. 75-198-Y-00042-09 JMLE, on behalf of Rathdrum Power LLC. Report on the operation of specific pricing provision of a tolling power purchase agreement.

188-Federal Energy Regulatory Commission. Docket No. IN06-3-003. Analyses on behalf of Energy Transfer Partners L.P. regarding trading activity in physical and financial natural gas markets.

187-Federal Energy Regulatory Commission. Docket No. ER08-1281-000. Analyses on behalf of Fortis Energy Trading related to the impacts of loop flow on trading activities and pricing.

186-American Arbitration Association. Report on behalf of PEPCO Energy Services regarding several trading transactions related to the purchase and sale of Installed Capacity under the PJM Reliability Pricing Model.

185-Federal Energy Regulatory Commission Docket No. EL-0-47. Analyses on behalf of HQ Energy services (U.S.) regarding pricing and sale of energy associated with capacity imports into ISO-NE.

184-Federal Energy Regulatory Commission Docket No. ER04-449 019, Affidavit on behalf of HQ Energy Services (U.S.) regarding the implementation of the consensus deliverability plan for the NYISO, and associated reliability impacts of imports.

183-Federal Energy Regulatory Commission Docket ER09-412-000, ER05-1410-010, EL05-148-010. Affidavit and Reply Affidavit on behalf of PSEG Companies

addressing proposed changes to the PJM Reliability Pricing Model and rebuttal related to other parties' filings.

2008

182-Pennsylvania Public Service Commission. *En Banc* Public Hearing on "Current and Future Wholesale Electricity Markets", comments regarding the design of PJM wholesale market pricing and state restructuring.

181-Maine Public Utility Commission. Docket No. 2008-156. Testimony on behalf of a consortion of energy producers and suppliers addressing the potential withdrawal of Maine from ISO New England and associated market and supplier response.

180-Federal Energy Regulatory Commission. Docket No. EL08-67-000. Affidavit on behalf of Duke Energy Ohio and Reliant Energy regarding criticisms of the PJM reliability pricing model (RPM) transitional auctions.

179-Federal Energy Regulatory Commission. Docket AD08-4, on behalf of the PJM Power Providers. Statement and participation in technical session regarding the design and operation of capacity markets, the status of the PJM RPM market and comments regarding additional market design proposals.

178-Federal Energy Regulatory Commission. Docket ER06-456-006, Testimony on behalf of East Coast Power and Long Island Power Authority regarding appropriate cost allocation procedures for merchant transmission facilities within PJM.

2007

177-FERC Docket No. EL07-39-000. Testimony on behalf of Mirant Companies and Entergy Nuclear Power Marketing regarding the operation of the NYISO In-City Capacity market and the associated rules and proposed rule modifications.

176-FERC Dockets: RM07-19-000 and AD07-7-000, filing on behalf of the PJM Power Providers addressing conservation and scarcity pricing issues identified in the Commission's ANOPR on Competition.

175-FERC Docket No. EL07-67-000. Testimony and reply comments on behalf of Hydro Quebec U.S. regarding the operation of the NYISO TCC market and appropriate bidding and competitive practices in the TCC and Energy markets.

174-FERC Docket Nos. EL06-45-003. Testimony on behalf of El Paso Electric regarding the appropriate interpretation of a bilateral transmission and exchange agreement.

2006

173-United States Bankruptcy Court for the Southern District of New York. Case No. 01-16034 (AJG). Report on Behalf of EPMI regarding the properties and operation of a power purchase agreement.

172-FERC Docket No. EL05-148-000. Testimony regarding the proposed Reliability Pricing Model settlement submitted for the PJM RTO.

171-FERC Docket No. ER06-1474-000, FERC. Testimony on behalf othe PSEG Companies regarding the PJM proposed new policy for including “market efficiency” transmission upgrades in the regional transmission expansion plan.

170-FERC Docket No. EL05-148-000, FERC. Participation in Commission technical sessions regarding the PJM proposed Reliability Pricing Model.

169-FERC Docket No. EL05-148-000, FERC. Comments filed on behalf of six PJM market participants concerning the proposed rules for participation in the PJM Reliability Pricing Model Installed Capacity market, and related rules for opting out of the RPM market.

168-FERC Docket No. ER06-407-000. Testimony on behalf of GSG, regarding interconnection issues for new wind generation facilities within PJM.

2005

167-FERC Docket No. EL05-121-000, Testimony on behalf of several PJM Transmission Owners (Responsible Pricing Alliance) regarding alternative regional rate designs for transmission service and associated market design issues.

166-FERC Technical Conference of June 16, 2005. (Docket Nos. PL05-7-000, EL03-236-000, ER04-539-000). Invited participant. Statement regarding the operation of the PJM Capacity market and the proposed new Reliability Pricing Model Market design.

165-American Arbitration Association Nos. 16-198-00206-03 16-198-002070.On behalf of PG&E Energy Trading. Analyses related to the operation and interpretation of power purchase and sale/tolling agreements and electrical interconnection requirements.

164-Arbitration on behalf of Black Hills Power, Inc. Expert testimony related to a power purchase and sale and energy exchange agreement, as well as FERC criteria related to the applicable code and standards of conduct.

2004

163-Federal Energy Regulatory Commission. Docket No. Docket No. EL03-236-003 Testimony on behalf of Mirant companies relating to PJM proposal for compensation of frequently mitigated generation facilities.

162-Federal Energy Regulatory Commission. Docket No. ER03-563-030. Testimony on behalf of Calpine Energy Services regarding the development of a locational Installed Capacity market and associated generator service obligations for ISO-NE. Supplemental testimony filed 2005.

161-Federal Energy Regulatory Commission. Docket No. EL04-135-000. Testimony on behalf on the Unified Plan Supporters regarding implications of using a flow based rate design to allocate embedded costs.

160-Federal Energy Regulatory Commission. Docket No. ER04-1229-000. Testimony on behalf of EME Companies regarding the allocation and recovery of administrative charges in the NYISO markets.

159-Federal Energy Regulatory Commission. Dockets No. EL01-19-000, No. EL01-19-001, No. EL02-16-000, EL02-16-000. Testimony on behalf of PSE&G Energy Resources and Trade regarding pricing in the New York Independent System Operator energy markets.

158-Federal Energy Regulatory Commission. Invited panelist regarding performance based regulation (PBR) and wholesale market design. Comments related to the potential role of PBR in transmission expansion, and its interaction with market mechanisms for new transmission.

157-Federal Energy Regulatory Commission. Docket No. ER04-539-000 Testimony on behalf of EME Companies regarding proposed market mitigation in the energy and capacity markets of the Northern Illinois Control Area.

156-Federal Energy Regulatory Commission. Standardization of Generator Interconnection Agreements and Procedures Docket No. RM02-1-001, Order 2003-A, Affidavit on Behalf of PSEG Companies regarding the modifications on rehearing to interconnection crediting procedures.

155-Federal Energy Regulatory Commission. Dockets ER03-236-000,ER04-364-000,ER04-367-000,ER04-375-000. Testimony on behalf of the EME Companies regarding proposed market mitigation measures in the Northern Illinois Control Area of PJM.

154-Federal Energy Regulatory Commission. Dockets PL04-2-000, EL03-236-000. Invited panelist, testimony related to local market power and the appropriate levels of compensation for reliability must run resources.

2003

153-American Arbitration Association. 16 Y 198 00204 03. Report on behalf of Trigen-Cineregy Solutions regarding an energy services agreement related to a cogeneration facility.

152-Federal Energy Regulatory Commission. Docket No. EL03-236-000. Testimony on behalf of EME Companies regarding the PJM proposed tariff changes addressing mitigation of local market power and the implementation of a related auction process.

151-Federal Energy Regulatory Commission. Docket No. PA03-12-000. Testimony on behalf of Pepco Holdings Incorporated regarding transmission congestion and related issues in market design in general, and specifically addressing congestion on the Delmarva Peninsula.

150-Federal Energy Regulatory Commission. Docket Nos. ER03-262-007, Affidavit on behalf of EME Companies regarding the cost benefit analysis of the operation of an expanded PJM including Commonwealth Edison.

149-Supreme Court of the State of New York, Index No. 601505/01. Report on behalf of Trigen-Syracuse Energy Corporation regarding energy trading and sales agreements and the operation of the New York Independent System Operator.

148-Federal Energy Regulatory Commission. Docket No. ER03-262-000. Affidavit on behalf of the EME Companies regarding the issues associated with the integration of the Commonwealth Edison Company into PJM.

147-Federal Energy Regulatory Commission. Docket No. ER03-690-000. Affidavit on behalf of Hydro Quebec US regarding New York ISO market rules at external generator proxy buses when such buses are deemed non-competitive.

146-Federal Energy Regulatory Commission. Docket RT01-2-006,007. Affidavit on behalf of the PSEG Companies regarding the PJM Regional Transmission Expansion Planning Protocol, and proper incentives and structure for merchant transmission expansion.

145-Federal Energy Regulatory Commission. Docket No. ER03-406-000. Affidavit on behalf of seven PJM Stakeholders addressing the appropriateness of the proposed new Auction Revenue Rights/Financial Transmission Rights process to be implemented by the PJM ISO.

144-Federal Energy Regulatory Commission. Docket No. ER01-2998-002. Testimony on behalf of Pacific Gas and Electric Company related to the cause and allocation of transmission congestion charges.

143-Federal Energy Regulatory Commission. Docket No. RM01-12-000. On behalf of six different companies including both independent generators, integrated utilities and distribution companies comments on the proposed resource adequacy requirements of the Standard Market Design.

142-United States Bankruptcy Court, Northern District of California, San Francisco Division, Case No. 01-30923 DM. On behalf of Pacific Gas and Electric Dr. Shanker

presented testimony addressing issues related to transmission congestion, and the proposed FERC SMD and California MD02 market design proposals.

2002

141-Arbitration. Testimony on behalf of AES Ironwood regarding the operation of a tolling agreement and its interaction with PJM market rules.

140-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Dr. Shanker was asked by the three Northeast ISO's to present a summary of his resource adequacy proposal developed in the Joint Capacity Adequacy Group. This was part of the Standard Market Design NOPR process.

139-Federal Energy Regulatory Commission. Docket No. ER02-456-000. Testimony on behalf of Electric Gen LLC addressing comparability of a contract among affiliates with respect to non-price terms and conditions.

138-Circuit Court for Baltimore City. Case 24-C-01-000234. Testimony on behalf of Baltimore Refuse Energy Systems Company regarding the appropriate implementation and pricing of a power purchase agreement and related Installed Capacity credits.

137-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Comments on the characteristics of capacity adequacy markets and alternative market design systems for implementing capacity adequacy markets.

2001

136-Federal Energy Regulatory Commission. Docket ER02-456-000. Testimony on behalf of Electric Gen LLC regarding the terms and conditions of a power sales agreement between PG&E and Electric Generating Company LLC.

135-Delaware Public Service Commission. Docket 01-194. On behalf of Conectiv et al. Testimony relating to the proper calculation of Locational Marginal Prices in the PJM market design, and the function of Fixed Transmission Rights.

134-Federal Energy Regulatory Commission. Docket No. IN01-7-000 On behalf of Exelon Corporation . Testimony relating to the function of Fixed Transmission Rights, and associated business strategies in the PJM market system.

133-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Comments on the basic elements of RTO market design and the required market elements.

132-Federal Energy Regulatory Commission. Docket No. RT01-99-000. On behalf of the One RTO Coalition. Affadavit on the computational feasibility of large scale regional transmission organizations and related issues in the PJM and NYISO market design.

131-Arbitration. On behalf of Hydro Quebec. Testimony related to the eligibility of power sales to qualify as Installed Capacity within the New York Independent system operator.

130-Virginia State Corporation Commission. Case No. PUE000584. On behalf of the Virginia Independent Power Producers. Testimony related to the proposed restructuring of Dominion Power and its impact on private power contracts.

129-United States District Court, Northern District of Ohio, Eastern Division, Case: 1:00CV1729. On behalf of Federal Energy Sales, Inc. Testimony related to damages in disputed electric energy trading transactions.

128-Federal Energy Regulatory Commission. Docket Number ER01-2076-000. Testimony on behalf of Aquila Energy Marketing Corp and Edison Mission Marketing and Trading, Inc. relating to the implementation of an Automated Mitigation Procedure by the New York ISO.

2000

127-New York Independent System Operator Board. Statement on behalf of Hydro Quebec, U.S. regarding the implications and impacts of the imposition of a price cap on an operating market system.

126-Federal Energy Regulatory Administration. Docket No. EL00-24-000. Testimony on behalf of Dayton Power and Light Company regarding the proper characterization and computation of regulation and imbalance charges.

125-American Arbitration Association File 71-198-00309-99. Report on behalf of Orange and Rockland Utilities, Inc. regarding the estimation of damages associated with the termination of a power marketing agreement.

124-Circuit Court, 15th Judicial Circuit, Palm Beach County, Florida. On behalf of Okeelanta and Osceola Power Limted Partnerships et. al. Analyses related to commercial operation provisions of a power purchase agreement.

1999

123-Federal Energy Regulatory Commission. Docket No. ER00-1-000. Testimony on behalf of TransEnergie U.S. related to market power associated with merchant transmission facilities. Also related analyses regarding market based tariff design for merchant transmission facilities.

122-Federal Energy Regulatory Commission. Docket RM99-2-000. Analyses on behalf of Edison Mission Energy relating to the Regional Transmission Organization Notice of Proposed Rulemaking.

121-Federal Energy Regulatory Commission. Docket No. ER99-3508-000. On behalf of PG&E Energy Trading, analyses associated with the proposed implementation and cutover plan for the New York Independent System Operator.

120-Federal Energy Regulatory Commission. Docket No. EL99-46-000. Comments on behalf of the Electric Power Supply Association relating to the Capacity Benefit Margin.

119-New York Public Service Commission, Case 97-F-1563. Testimony on behalf of Athens Generating Company describing the impacts on pricing and transmission of a new generation facility within the New York Power Pool under the new proposed ISO tariff.

118-JAMS Arbitration Case No. 1220019318 On behalf of Fellows Generation Company. Testimony related to the development of the independent power and qualifying facility industry and related industry practices with respect to transactions between cogeneration facilities and thermal hosts.

117-Court of Common Pleas, Philadelphia County, Pennsylvania. Analyses on behalf of Chase Manhattan Bank and Grays Ferry Cogeneration Partnership related to power purchase agreements and electric utility restructuring.

1998

116-Virginia State Corporation Commission. Case No. PUE 980463. Testimony on behalf of Appomattax Cogeneration related to the proper implementation of avoided cost methodology.

115-Virginia State Corporation Commission. Case No. PUE980462 Testimony on behalf of Virginia Independent Power Producers related to an applicaton for a certificate for new generation facilities.

114-Federal Energy Regulatory Commission. Analyses related to a number of dockets reflecting amendments to the PJM ISO tariff and Reliability Assurance Agreement.

113-U.S. District Court, Western Oklahoma. CIV96-1595-L. Testimony related to anti-competitive elements of utility rate design and promotional actions.

112-Federal Energy Regulatory Commission Dockets No. EL94-45-001 and QF88-84-006. Analyses related to historic measurement of spot prices for as available energy.

111-Circuit Court, Fourth Judicial Circuit, Duval County, Florida. Analyses related to the proper implementation of a a power purchase agreement and associated calculations of capacity payments. (Testimony 1999)

1997

110-United States District Court for the Eastern District of Virginia, CA No. 3:97CV 231. Analyses of the business and market behavior of Virginia Power with respect to the implementation of wholesale electric power purchase agreements.

109-United States District Court, Southern District of Florida, Case No. 96-594-CIV, Analyses related to anti-competitive practices by an electric utility and related contract matters regarding the appropriate calculation of energy payments.

108-Virginia State Corporation Commission. Case No. PUE960296. Testimony related to the restructuring proposal of Virginia Power and associated stranded cost issues.

107-Federal Energy Regulatory Commission. Dockets No. ER97-1523-000 and OA97-470-000, Analyses related to the restructuring of the New York Power Pool and the implementation of locational marginal cost pricing.

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