

**BEFORE THE UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY**

<b>National Emission Standards for</b>	)	
<b>Hazardous Air Pollutants From Coal and</b>	)	
<b>Oil-Fired Electric Utility Steam</b>	)	<b>EPA-HQ-OAR-2009-0234</b>
<b>Generating Units and Standards of</b>	)	
<b>Performance for Fossil-Fuel-Fired</b>	)	<b>EPA-HQ-OAR-2011-0044</b>
<b>Electric Utility, Industrial-Commercial-</b>	)	
<b>Institutional, and Small Industrial-</b>	)	<b>FRL-9286-1</b>
<b>Commercial-Institutional Steam</b>	)	
<b>Generating Units</b>	)	

**COMMENTS OF PJM INTERCONNECTION, L.L.C.**

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Dated: August 4, 2011

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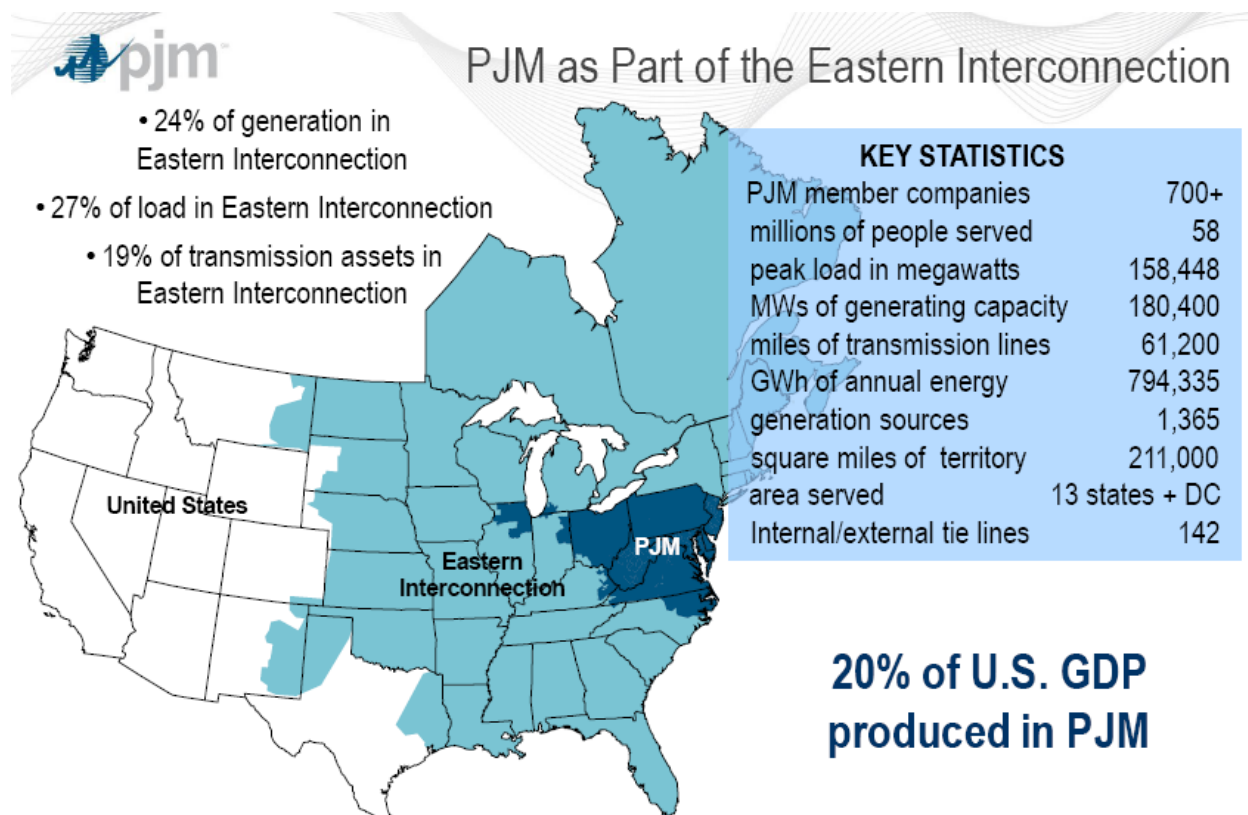
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**COMMENTS OF PJM INTERCONNECTION, L.L.C.**

PJM Interconnection, L.L.C. (“PJM”) files these Comments in response to the EPA’s Notice of Proposed Rulemaking of the United States Environmental Protection Agency (“EPA”) in the above referenced proceeding. PJM is the Federal Energy Regulatory Commission (“FERC”) approved Regional Transmission Organization (“RTO”) serving all or parts of the 13 states of Illinois, Indiana, Michigan, Kentucky, Tennessee, Ohio, West Virginia, North Carolina, Virginia, Maryland, Delaware, Pennsylvania and New Jersey plus the District of Columbia. PJM operates the largest competitive wholesale market in the nation and is responsible for both the planning and reliable operation of the bulk power electric grid serving over 58 million people in its region. PJM manages over 180,000 MW of generation which collectively serves a peak demand of over 158,000 MW. The PJM region, depicted below, encompasses 24% of all of the generation in the Eastern Interconnection, 27% of the load and 19% of the total transmission assets in the Eastern Interconnection. Approximately 20% of the U.S. Gross Domestic Product is produced in the region served by PJM.



## **EXECUTIVE SUMMARY OF COMMENTS**

PJM submits these comments with respect to the compliance timeframe contained in Section V.M of the Proposed Rule.<sup>1</sup> PJM appreciates the Proposed Rule's recognizing the need to maintain system reliability and the agency's pledge in the Proposed Rule to work with RTOs and others to ensure that its Final Rule does not adversely impact system reliability.<sup>2</sup> However, PJM is concerned that, with respect to those generating units which PJM identifies as Reliability Critical Units, the current compliance timeframe could severely impact reliability unless such units are provided a limited extension of time to comply. "Reliability Critical Units" are those generating units whose retirement/deactivation would result in violations of applicable reliability criteria unless appropriate transmission or resource reinforcements are forthcoming.

The Proposed Rule provides that existing generating units must come into compliance with the emission standards established under the Final Rule within 3 years from publication of the Final Rule in the Federal Register.<sup>3</sup> The Proposed Rule also allows extension of the compliance deadline by 1 year if an existing generating unit is going to install pollution controls to come into compliance with the standards. Finally, the Proposed Rule provides that if an existing generation unit retires rather than comes into compliance with the standards, and if replacement generation is being installed at the same location, such replacement generation can be considered in the same light as installing pollution controls and the same 1-year extension will apply (in other words, that retiring generator can remain in service for the additional 1 year without being held in non-compliance with the standards.)

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<sup>1</sup> U.S. Environmental Protection Agency National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial- Institutional, and Small Industrial- Commercial-Institutional Steam Generating Units, 79 Fed. Reg. 24976 (proposed May 3, 2011) (to be codified at 40 C.F.R. Pts. 60 & 63) ("Proposed Rule").

<sup>2</sup> 79 Fed. Reg. 25054.

<sup>3</sup> For purposes of these comments, we are assuming that date will be January 1, 2015. There is a discrepancy between the Proposed Rule and Section 112 of the Clean Air Act ("CAA") with respect to the point from which the compliance timeframe runs. That is, Section 112 of the CAA provides that compliance shall occur no later than 3 years from the effective date of the standard; whereas the Proposed Rule states that the compliance date is 3 years after publication in the Federal Register. PJM assumes that the compliance clock runs from the effective date of the Final Rule.

PJM's proposal is to allow the 1-year extension, and potentially a further extension beyond 1 year if necessary for reliability,<sup>4</sup> under the following circumstances:

- (1) An asset owner provides notice to PJM and the EPA no later than the earlier of 12 months after the effective date of the Final Rule, or by January 1, 2013 that it intends to retire;
- (2) PJM determines, through its public planning process, that the unit is a Reliability Critical Unit; and
- (3) Transmission reinforcements or alternative resources in the form of replacement generation (not necessarily at the same site), dispatchable demand response or energy efficiency targeted to the affected locations are being installed to ensure continued compliance with applicable reliability criteria.

To support this limited extension, PJM shows in these Comments that the analysis of reliability impacts contained in the Proposed Rule, although helpful, does not take into account the full spectrum of reliability issues, including local reliability impacts, associated with plant retirement decisions made by asset owners in response to the Proposed Rule. Local reliability impacts, as described more fully herein, are those reliability impacts that occur in an area that typically does not have enough generation to serve its load and must import much of its electricity via transmission lines. Although PJM has not identified at this time near-term resource adequacy issues associated with this particular Proposed Rule, PJM is concerned about the local reliability impacts that may arise from any single or set of unit retirements. By limiting its reliability analysis to resource adequacy and a representation of transmission limited to transfers between regions, the Proposed Rule understates the impact of the Proposed Rule on system reliability.

Moreover, PJM details in its Comments concerns with certain of the Proposed Rule's findings and its analysis of the timing and feasibility of local transmission reinforcements, replacement generation or Demand Response/Energy Efficiency resources substituting for retiring generation. PJM details in these Comments the challenges it has experienced in securing adequate and timely transmission reinforcements to meet announced retirements.

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<sup>4</sup> Should such an extension be needed, the asset owner, relying on findings of PJM concerning reliability impacts and the need for alternative resources and/or transmission reinforcements, would work with EPA to identify a specific date when alternative resources and/or transmission reinforcements would be in place to address the pre-identified reliability need resulting from the retirement. Necessary reinforcements would be identified and reviewed in the RTO's FERC-approved public and transparent stakeholder process. The details of when the Reliability Critical Unit would be permitted to run and for what length of time should, by necessity, be addressed on a unit-specific case-by-case basis. PJM is seeking the recognition and establishment of such a process in the Final Rule, with its actual implementation details addressed on a case-by-case basis.

PJM believes its proposal, summarized above and detailed in Section VI of these Comments, offers a tangible solution that will accommodate Congress' mutual goals of ensuring a clean environment and continuing reliability of the bulk power grid.<sup>5</sup> A process such as the one proposed by PJM should be embedded in the Final Rule to provide a clearly defined means to address potential reliability challenges that may arise from implementation of the Proposed Rule. PJM's proposed process, which it urges to be incorporated in the Final Rule as a reliability safeguard, is based on PJM's experience in dealing with plant retirements in its footprint and the feasibility of timely installing adequate alternatives to maintain system reliability. In a broader sense, PJM's experiences cited below are based on its many years of planning for, and directing the operation of, the bulk power grid in the region it serves.

PJM wishes to make clear at the outset, that it is **not** seeking an overall blanket extension of the implementation of the Final Rule itself. Rather, PJM's proposal is grounded in providing limited, targeted and temporary relief from the compliance deadline in those defined instances where PJM would issue unit-specific findings of adverse reliability impacts in response to timely notices of retirement. Under PJM's proposal, PJM can analyze and direct necessary transmission upgrades to address system or local reliability issues that cannot be remedied within the compliance timeframe discussion in Section V.M. of the Proposed Rule in order to maintain reliability. In those limited situations, the "reliability safeguard extension" operates as a compliance "safe harbor" for Reliability Critical Units planning to deactivate – *so long as such unit provides what amounts to at least 2 years' notice of retirement prior to the effective date of the rule* – and so long as an alternative resource is not available within the compliance period to address the reliability impact of the unit's retirement. The rule should equally apply to units seeking to retire which are Reliability Critical Units and units that are being retrofitted. In both cases, the compliance action (retrofit or retirement) will ensure the unit achieves the emission rate standards set forth in the Proposed Rule. Moreover, in both cases, capital investment is required (new transmission or replacement resources in the case of a retiring unit and a retrofit in the case of a unit continuing in service) to ensure emissions are reduced to ensure compliance with the rule and bulk power system reliability.

Moreover, the targeted remedy proposed by PJM herein will allow the Final Rule to take into account and accommodate Congress's related goal of ensuring bulk system reliability as envisioned in Section 215 of the Federal Power Act.<sup>6</sup> The two goals must work in conjunction with each other rather than at cross-purposes. PJM's proposal accommodates that goal.

## **I. PJM's RESPONSIBILITIES AS AN RTO**

FERC Order No. 2000 sets forth the specific characteristics and functional responsibilities of an RTO. These include:

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<sup>5</sup> Clean Air Act, 42 U.S.C. Sec. 7401, *et seq.*, (2010); Federal Power Act, 16 U.S.C. Sec. 824o (2010).

<sup>6</sup> 16. U.S.C. Section 824o.

- Short-term Reliability
- Operational Authority
- Planning and Expansion
- Congestion Management; and
- Interregional Coordination<sup>7</sup>

In order to be recognized as an RTO, FERC requires that the governance structure of the entity so requesting be entirely independent of asset owners and operators. Consistent with its RTO designation,<sup>8</sup> PJM's Board of Managers ("Board") is entirely independent of its market participants. As memorialized in PJM's governing documents such as the Operating Agreement, the Board's responsibility is to:

- Ensure reliable operation of the grid;
- Promote robust competitive wholesale markets; and
- Avoid undue influence by any market participant or group of market participants.<sup>9</sup>

#### **A. PJM's Limited Authority Over Generation**

Consistent with its duties as an RTO as spelled out in FERC Order No. 2000, PJM has registered with the North American Electric Reliability Corporation ("NERC") as, among other categories, the balancing authority and reliability coordinator for its 13-state footprint. In this role, PJM can direct actions to ensure that the generating units within its footprint are operated in a manner which meets approved reliability standards. However, it should be noted that the generators in PJM's footprint have largely been deregulated at the wholesale level as a result of FERC rulemakings and orders. Although PJM can direct certain actions be taken by generators to avert emergencies, it should be noted that PJM cannot direct the construction or operation of particular generating units nor require upgrades to those generation units. FERC has reaffirmed PJM's important but limited role by rejecting a PJM Open Access Transmission Tariff ("PJM Tariff" or "Tariff") proposal that would require a generator to continue operating by noting:

we are rejecting the specific language . . . that provides that PJM can "require" generators to continue to operate for an indeterminate period, because PJM has not adequately shown that it has the authority to require generators to operate beyond a reasonable notice period.<sup>10</sup>

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<sup>7</sup> *Regional Transmission Organizations*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089 (1999), *order on reh'g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000), *aff'd sub nom. Pub. Util. Dist. No. 1 of Snohomish County, Washington v. FERC*, 272 F.3d 607 (D.C. Cir. 2001) ("FERC Order No. 2000").

<sup>8</sup> PJM received RTO designation by FERC in 2001. See *PJM Interconnection, L.L.C., et al.*, 96 FERC ¶ 61,061 (2001).

<sup>9</sup> Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. at Section 7.

<sup>10</sup> *PJM Interconnection, L.L.C.*, 110 FERC ¶ 61,053 at P 137 (2005).



As a result, the PJM Tariff currently requires only 90 day's notice of a generating unit's plan to retire prior to that unit formally retiring.<sup>11</sup> Within 30 days of the receipt of a generator's notice of deactivation under the PJM Tariff, PJM must inform the generator whether deactivating the generating unit would adversely affect the reliability of the transmission system.<sup>12</sup> Regardless of whether deactivating the generating unit would adversely affect the reliability of the transmission system, the generator may deactivate its generating unit, subject to the notice requirements in the PJM Tariff.<sup>13</sup> The costs of transmission upgrades are not borne by the retiring unit but instead are allocated to loads within PJM. In short, there is no "exit fee" associated with units retiring from service within the PJM footprint, nor does PJM have the legal authority to simply block an intended retirement.

By the same token, at least 8 of the states, as well the District of Columbia, in PJM's footprint have restructured their regulation of generation at the retail level. In certain states restructuring laws have limited the state's ability to direct upgrades or retirements to particular units.

## **B. PJM Authority Over Transmission**

Because transmission remains a regulated asset, largely at the wholesale level, PJM has greater, albeit still limited, authority to order transmission upgrades. Specifically, transmission owners joining PJM are required to sign the Consolidated Transmission Owners Agreement. The Transmission Owners Agreement authorizes the PJM Board to direct transmission upgrades that the Board determines, consistent with the Operating Agreement, are needed to address either system wide or local reliability criteria violations. PJM exercises this authority through its open and transparent Regional Transmission Expansion Plan Process ("RTEPP").

## **II. ATTRIBUTES OF RELIABILITY**

### **A. Reliability Concepts and Local Reliability Defined**

Both NERC reliability standards, and the local reliability criteria, are intended to evaluate and ensure preservation of the electric reliability of the transmission system. As used by industry experts, the terms "electric reliability" or "reliability" refer to the delivery of electricity to customers in the amounts desired and within acceptable standards for frequency, duration and magnitude of outages and other adverse

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<sup>11</sup> PJM Tariff at Section 113.1. PJM is not unique among RTOs with respect to the notice requirement; with other RTOs' notice requirements generally ranging from 90-180 days.

<sup>12</sup> PJM Tariff at Section 113.2

<sup>13</sup> During that period, the generator can decide to remain in operation for the period that it takes to reinforce the system for the reliability impacts and either be paid under a Reliability Must Run agreement (designed to cover a unit's costs) or file with FERC for cost based rates; but the generator is not required to do so

conditions or events.<sup>14</sup> According to NERC, the industry has often defined “reliability” with two concepts: system security and resource adequacy.<sup>15</sup>

## 1. Attributes of System Security

System security, as it relates to reliability, is defined as the ability of the electric system to withstand sudden disturbances such as electric short circuit or unanticipated loss of some system component such as a line, transformer, or generating unit. The notion of system security comprises two elements: 1) transmission security; and 2) maintenance of sufficient ancillary services. Transmission security ensures that all transmission assets (lines and transformers) do not exceed their designed maximum loadings and that designated voltage levels are maintained in actual operation or in the case of a contingency.

Generation contributes to system security through 1) changes in the amount of generation that is dispatched to produce energy in real-time to meet load while respecting the physical limitations of the transmission system, and through 2) the provision of ancillary services that support the transmission of capacity and energy from generation to load while maintaining reliable operation of the transmission system.<sup>16</sup> Ancillary services such as Voltage and Reactive Power Support are necessary to maintain transmission system voltages within acceptable ranges.<sup>17</sup> Ancillary services such as Reserves,<sup>18</sup> Regulation and Frequency Response<sup>19</sup> and Black Start Service<sup>20</sup>

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<sup>14</sup> “Reliability standard” is defined as “a requirement, approved by the Commission under this section, to provide for reliable operation of the bulk-power system. The term includes requirements for the operation of existing bulk-power system facilities, including cybersecurity protection, and the design of planned additions or modifications to such facilities to the extent necessary to provide for reliable operation of the bulk-power system, but the term does not include any requirement to enlarge such facilities or to construct new transmission capacity or generation capacity.” 16 U.S.C. Section 824o(a)(3).

<sup>15</sup> See NERC FAQs which can be found at the following URL link:

<http://www.nerc.com/page.php?cid=1%7C7%7C114> .

<sup>16</sup> See NERC Glossary of Terms, [http://www.nerc.com/files/Glossary\\_of\\_Terms\\_2011May24.pdf](http://www.nerc.com/files/Glossary_of_Terms_2011May24.pdf).

<sup>17</sup> Voltage and Reactive Power Support (“Voltage Support”) supports power flows across the high voltage transmission system that allows power to be generated at one location and delivered to loads at another location often far from the generation source. It is essential to maintain voltages at prescribed levels to facilitate delivery of energy often across long distances.

<sup>18</sup> Reserves represent capacity on generating units that is available within a prescribed time frame in the event of a system contingency such as the loss of a transmission facility or a generator. Reserves allow the system to continue operating and delivering energy to load without any shedding of load and while maintaining transmission security. Moreover, there are locational requirements for Reserves in PJM so that power may be delivered even if something occurs in system operations affecting generation supply or transmission availability.

<sup>19</sup> Regulation and Frequency Response (“Regulation”) ensures system frequency can be maintained at 60 Hertz (cycles per second) and balances out small changes in generation and demand that occur on a moment by moment basis. Failure to maintain the system frequency at 60 Hertz could lead to system instability, and deviations too far from the desired frequency can cause generating units to trip off-line and no longer be able to inject power into the grid leading to a potential system collapse. Regulation is primarily supplied by generating units that have the technological capability to respond to moment by moment changes in the supply and demand balance. Storage technologies such as batteries and flywheels, and demand resources are also eligible to provide Regulation in PJM, although these

also help with overall system security. Voltage Support and Black Start are location specific in nature, which leaves these services vulnerable when they are provided by a relatively small set of generators.

## **2. Attributes of Resource Adequacy**

Resource adequacy is the ability of the electric system to supply the aggregate energy requirements of electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of generation and transmission facilities. To achieve the goal of resource adequacy, PJM maintains an installed reserve margin in excess of the forecasted peak load that achieves a loss of load expectation of 1 day in 10 years. This loss of load expectation standard is consistent with that prescribed in the *ReliabilityFirst* Corporation (“RFC”) standard for planning resource adequacy.<sup>21</sup> RFC is the FERC-approved regional reliability entity under NERC that oversees reliability matters in the PJM region.

The mechanism by which PJM maintains resource adequacy is the Reliability Pricing Model (“RPM” or “RPM Capacity Market”). The objective of the RPM Capacity Market is to commit the least-cost set of capacity resources, including generation, Demand Response and Energy Efficiency resources, to maintain the target installed reserve margin. The RPM Capacity Market also accounts for the deliverability of resources over the transmission system through the modeling of potentially binding major transmission constraints so that if more capacity is needed in a constrained region, it can be committed.

The RPM Capacity Market procures and commits the majority of capacity resources in an auction (known as the Base Residual Auction – “BRA”) three years in advance of the year in which those resources must be available (known as a “Delivery Year”). Further, three additional auctions (known as “Incremental Auctions”) are conducted leading up to the Delivery Year, through which additional capacity can be committed if necessary to satisfy load growth exceeding the initial forecast. Buyers and Sellers are also permitted to change their capacity market positions during the Incremental Auctions.

The RPM Capacity Market clearing prices reflect both the capital cost to develop and maintain capacity resources and the physical limitations of the transmission system, including the ability to reliably deliver power to all areas of PJM. If the capital costs of capacity resources decrease, the price of capacity will also likely decrease, all else equal. It is possible for the cost to decrease to a point where the RPM Capacity Market

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resources account for only a tiny fraction of these ‘regulating’ resources. PJM operates a market for Regulation on an hourly basis in order to maintain sufficient resources to provide this service.

<sup>20</sup> Black Start Service refers to generation that can provide power to start other generation on the system to aid in system restoration. Black Start Service is location specific to meet the requirements to provide start-up power to generation at specific locations to aid in system restoration.

<sup>21</sup> RFC Standard BAL 502 RFC 02: Planning Resource Adequacy Analysis, Assessment and Documentation.

would commit capacity resources in excess of the installed reserve margin target if cost-effective to do so. Conversely, if the capital costs of capacity resources increase, as would be the case for resources requiring environmental retrofits under the instant Proposed Rule, the price of capacity likely will increase, all else equal, and fewer capacity resources will be committed; possibly at a level below the installed reserve margin. Finally, if it is necessary to commit resources in an area with major transmission constraints, prices in the constrained area will be higher than in other areas that are unconstrained.

### **3. Local Reliability**

The two concepts of system security and resource adequacy also apply in locally constrained areas or so-called “load pockets.” Load pockets are created when a major electric load center (*i.e.*, an area where there is a highly concentrated use of electricity such as the major urban centers along the east coast) has too little local generation relative to its load (likely due to difficulties of siting and building new generation in such areas) and must import much of its electricity via transmission lines.

Serving load pockets presents special reliability challenges related to system security. PJM as the transmission operator has to take steps to re-dispatch generation to avoid lines becoming overloaded in real-time operation. If generation resources that could otherwise be re-dispatched to maintain transmission security retires, in the longer term solutions such as transmission reinforcements will be necessary to prevent such overloads that can represent violations of FERC-approved reliability criteria. Importantly, these reliability challenges are not limited to the load pocket; they can adversely affect the areas surrounding the transmission facilities needed to carry that generation to the load pockets.

The presence of transmission constraints leading in to an area identified as a load pocket necessitates maintaining location-specific resources such as local generation to serve load in the load pocket under a variety of conditions. As mentioned above, certain ancillary services are location-specific by their nature and must function in close electrical proximity to where they are needed. As detailed below, it is these locational issues that need to be accounted for in EPA’s Final Rule along with resource adequacy.

#### **B. Ensuring Transmission Security: The Role of the Transmission Planning Process.**

From a transmission planning perspective, transmission security ensures that during future forecasted peak system conditions, all identified violations of transmission reliability planning criteria are solved, including those related to thermal loadings, voltage levels and stability. In real-time operations, transmission security ensures that all transmission assets (lines and transformers) do not exceed their designed maximum loadings and that designated voltage levels in actual operation. Transmission security requirements also ensure that the bulk power system is resilient enough to withstand

contingencies such as the loss of a line, tower or transformer while continuing to deliver energy and capacity from generation to load without interruption. In such situations, transmission security is maintained by operating transmission facilities with sufficient margin to take into account such contingencies. Failure to maintain adequate transmission security could result in the system operator invoking emergency operation procedures up to and including the shedding of load in a local area in order to prevent a cascading outage.

From a planning perspective, transmission security is maintained by proposing and directing the building of new transmission facilities, or transmission enhancements, to ensure energy is deliverable to load under forecasted peak conditions without violating reliability criteria, including that which governs acceptable thermal and voltage limits.<sup>22</sup> These peak conditions account for forecast changes in load levels and/or decreases in available generation in a constrained area that may be the cause of the need for a new transmission facility. Through its public planning process, PJM documents all conditions for which the system does not meet applicable reliability standards and identifies the system transmission reinforcements required to bring the system into compliance. The RTEPP also includes development of estimated costs and lead-times to implement upgrades needed to resolve identified reliability criteria violations. PJM experience in the RTEPP has shown that the inclusion or, more importantly for purposes of these Comments, exclusion of significant generation resources, particularly those in electrical proximity to constrained transmission facilities, can have a marked impact on the occurrence and timing of projected violations of NERC Reliability Standards. In short, the retirement of generation can, depending on the local circumstances, compel the need for significant transmission reinforcements.

### **III. THE EFFECTS OF RETIRING GENERATION ON LOCAL RELIABILITY**

Changes in generation – and generating unit retirements in particular (referred to as retirements or deactivations interchangeably in these Comments)– alter power flow on transmission lines, transformers and circuit breakers; impact transmission system bus voltages potentially leaving fewer, or locally no generating resources to maintain transmission security. Additionally, generation deactivations or retirements leave potentially fewer resources to provide Ancillary Services such as Reserve, Regulation, and Black Start capability described above.

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<sup>22</sup> PJM's RTEPP validates compliance with NERC standards for Category A (TPL-001), Category B (TPL-002) and Category C (TPL-003) events for each year over a 15-year planning horizon. Specifically, NERC Reliability Standards require that a transmission system be stable and within applicable equipment thermal ratings and system voltage limits, as specified by PJM Operations. See PJM Manual M-3, accessible from PJM's website via the following URL link: <http://www.pjm.com/~media/documents/manuals/m03.ashx>

### **A. Transmission Security Issues That May Result From Generation Retirement And Potential Solutions**

The retirement of a generating unit may create transmission security problems in a local area absent any replacement resource in that location. Local transmission security issues may arise when a retiring generating unit causes changes in power flows during system peak load conditions that cause thermal and voltage limit violations.

Once PJM receives a deactivation request from a generator, PJM studies regional power flows based on forecast system conditions, including the system impacts caused by generator deactivation. Studies test the transmission system against mandatory NERC and RFC reliability standards, looking 15 years into the future to identify transmission overloads, voltage limitations and other reliability standards violations. PJM is required to develop and implement a solution for each identified violation which could otherwise lead to overloads, equipment failure, and in the most extreme circumstances a black-out.

In considering solutions for reliability violations, demand reduction initiatives such as Demand Response and Energy Efficiency are helpful tools, but unless the Demand Response and Energy Efficiency is committed in the RPM Capacity Market three years in advance, the Demand Response and Energy Efficiency is largely voluntary and, as a result, cannot guarantee the mitigation of the relevant reliability risks.<sup>23</sup> Demand Response located within the load pocket which make a financial commitment to PJM's capacity market through the RPM auctions can and does help ensure the need for adequate overall reserves in a given sub-region of PJM. However, even if Demand Response is being encouraged and new generation is being explored, construction of new or upgraded transmission lines is often essential to prevent imminent reliability problems from occurring while those alternatives are pursued and to account for the potential that those alternatives may not materialize in sufficient quantity to eliminate the reliability problem. As noted previously, PJM does not have the authority under any of its FERC-approved tariff documents to compel the construction of generation or procurement of Demand Response or Energy Efficiency. The availability of these resources remain the province of market forces.

At the most fundamental level, the need for solutions to reliability violations triggered by generation retirements stems from imbalances between the local generation resources and transmission capability to deliver energy and capacity from such resources. There may be multiple potential solutions to the reliability violations ranging from replacement generation, Demand Response or Energy Efficiency resources to transmission reinforcements. But given PJM's lack of authority to compel replacement generation or alternative resources such as Demand Response and Energy Efficiency resources, as explained above, transmission reinforcements -- developed to alleviate potential violations of voltage and thermal limits -- are the primary

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<sup>23</sup> PJM explains herein the requirements of its capacity procurement as it affects both retiring generation and demand response/energy efficiency resources.

direct solution available to PJM to address local reliability problems caused by generation retirements.

### **B. Challenges of Generator Deactivation on the Provision of Critical Ancillary Services**

As previously mentioned, generation is often relied upon to provide critical Ancillary Services, such as Voltage Support and Black Start Service to ensure system security. When such a unit retires, there can be a negative impact on system security. Addressing these impacts can be difficult, given the location-specific nature of the services such units provide, as described herein.

"Voltage" is a measurement of the potential for an electric field to cause an electric current in a conductor; it is essentially analogous to pressure in a fluid. Voltage can be described as a "carrier" of electric energy. Voltage stability is important for a number of reasons. For instance, on the transmission system itself, transmission voltages must be maintained within specific tolerances to ensure that voltage-sensitive equipment operates properly. Most often, Voltage Support is provided by location-specific generation and thus can be impacted due to retirements, particularly of those older plants in urban areas where it is difficult to site and install new generation.

Black Start service, whether provided directly by small diesel or natural gas combustion turbines, or indirectly by larger units through "automatic load rejection,"<sup>24</sup> is also a service that is location specific. Transmission owners require Black Start Service at specific locations with the purpose of providing start-up power to generating units specified as part of the transmission owner's restoration plan should there be a blackout on that part of the power system. In the event a generator that provides Black Start Service is retiring, PJM must issue a request for proposal process to secure replacement Black Start capability. Replacing Black Start capability can take in the range of 6-36 months, depending on whether an existing unit will agree to replace the service or if new generation needs to be constructed.

### **C. Drivers for Generator Deactivation and Implications for Resource Adequacy**

In a wholesale electricity market such as in PJM, generating units will only retire when generation asset owners believe the costs of continuing to operate, including the costs of environmental retrofits and desired returns on capital, exceeds the expected revenues from PJM's markets. To the extent the installation of environmental retrofits is costly and the generator does not expect to receive sufficient revenue from the markets, resources adequacy will not be impaired if there are sufficient capacity resources to meet the installed reserve margin targets.

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<sup>24</sup> "Automatic load rejection allows a generating unit to separate from the grid in the case of a major disturbance and operate in isolation until it can be reconnected to the grid to supply start-up power to other resources.

In the alternative, if insufficient resources are available at a lower cost, and the generating unit with high retrofits costs clears in the RPM Capacity Market, PJM will commit that unit's capacity, albeit at a higher price of capacity, such that the cost of maintaining resource adequacy will rise in the face of the impending environmental rules.

Finally, if the costs of environmental retrofits are sufficiently high for a large number of generating units, and there are not sufficient lower cost resources available to replace this capacity, capacity prices will rise to such a point that it will be considered cost-effective in the RPM Capacity Market to commit capacity at levels below the installed reserve margin thereby reducing resource adequacy reliability below the target 1-day-in-10-year threshold. This condition cannot be sustained indefinitely. The PJM Reliability Backstop mechanisms intended to guarantee that sufficient generation, transmission and Demand Response solutions will be available to preserve system reliability, is triggered by reliability criteria violations caused by: (a) lack of sufficient capacity committed through the RPM Capacity Market; or (b) near-term transmission deliverability violations identified after the Base Residual Auction is conducted.<sup>25</sup>

Transmission upgrades – new transformers, circuit breaker replacements, and line re-conductoring, for example – often can be put in place to address local reliability criteria violations, given sufficient procurement and construction lead time. In still other deactivation cases, new transmission facilities or upgrades to existing facilities can be installed to address thermal problems; and, reactive devices such as capacitors or static VAR compensators can be installed to address voltage problems on the system. However, these types of upgrades may require more than 90 days, the shortest advance notice PJM could receive for a retirement. Sufficient lead time is required to engineer the appropriate solution, procure equipment and complete all necessary construction. The time required to implement a transmission solution can vary considerably based on the size and complexity of the upgrade. Incremental upgrades to existing facilities can often be timely completed, particularly if no additional siting certifications are required. Upgrades such as new transmission lines that may require siting approval almost certainly take longer – often considerably longer.<sup>26</sup>

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<sup>25</sup> The Reliability Backstop may be found in Section 16 of Attachment DD of the PJM Tariff.

<sup>26</sup> For example, the construction of the Susquehanna-Roseland line is currently being delayed due to by federal agency environmental impact review. The need for this backbone transmission line was first identified by PJM and approved by the Board as part of 2007 RTEPP. At that time, the line was anticipated to be in service for 6/1/2012 to avoid identified reliability criteria violations. However, delays due to National Park Service review have delayed the in-service date of this line to 2015 at the earliest. See <http://pjm.com/planning/rtep-upgrades-status/backbone-status/susquehanna-roseland.aspx> Similarly, the retirement by Exelon Generation of the Cromby Unit 2 and Eddystone Unit 2 requires 18 separate transmission system enhancements to address the identified thermal, voltage and short circuit violations. Thus, even though Cromby and Eddystone provided notice of deactivation in December, 2009, due to the need for such transmission enhancements the units are not actually going to shut down until May, 2012. In the interim, their operation is environmentally limited. See <http://www.pjm.com/planning/generation-retirements/~media/planning/gen-retire/pending-deactivation-requests.ashx>



#### IV. SPECIFIC COMMENTS ON EPA'S RELIABILITY ANALYSIS

In conjunction with the issuance of the Proposed Rule, the EPA also issued a ten- page resource adequacy and reliability analysis that indicates there are no resource adequacy or reliability problems with the implementation of the Proposed Rule. While PJM appreciates the EPA's recognition that resource adequacy and reliability are potentially a concern under this Proposed Rule, the analysis falls short in providing the detailed and rigorous examination of reliability as PJM has described in the previous sections, especially as applied to local reliability issues.<sup>27</sup>

The insufficiency of the EPA resource adequacy and reliability analysis stems from three major assumptions that do not match the realities faced by RTOs like PJM and its wholesale market participants. Specifically, the EPA analysis erroneously assumes: 1) wholesale power markets mirror least-cost planning models; 2) reliability is related to only movements of power between large geographic areas; and 3) there are no transmission or deliverability constraints within those areas.

The reliance on such assumptions, while making a nationwide analysis of broad resource adequacy and reliability trends, tractable from a computational and data input perspective, lead to conclusions regarding resource adequacy and operating reliability that do not match up with the experience of RTOs and generation asset owners. Specifically EPA's conclusions do not necessarily match with the potential level of retirements that the PJM region may see as evidenced by approximately 7,350 MW of coal-fired generation installed capacity, that have failed to clear the three year forward RPM Capacity Market auction for the 2014/2015 Delivery Year. PJM has released analyses of its most recent three year auction results which indicates that the failure of many of these coal units to clear on a three year forward basis appears to be largely attributable to their estimation of the costs of retrofitting these older units.<sup>28</sup>

PJM does not claim, at this early stage when the final EPA rules are still unknown, to know the exact amount of generation, let alone the location of generation, that will retire. Indeed, this uncertainty (and the lead time associated with planning,

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<sup>27</sup> The Proposed Rule does recognize that the analysis was undertaken on a macro-level and does not address these local reliability issues. However, as PJM details herein, these local reliability issues and, in particular, the ability to provide ancillary services such as Black Start and Voltage Support, can be exacerbated if there are significant generation retirements. Additionally, ICF International recently released a paper entitled *Retiring Coal Plants While Protecting System Reliability*, wherein ICF International reported the results of its analyses of the Proposed Rule's impact on transmission security stating, "The results of ICF International's analyses suggest that the location of the power plants being taken offline can significantly impact system reliability . . . ." <http://www.icfi.com/insights/white-papers/2011/retiring-coal-plants-while-protecting-system-reliability>

<sup>28</sup> See 2014-2015 Reliability Pricing Model Base Residual Auction Report Addendum, [http://www.pjm.com/markets-and-operations/rpm/~media/markets-ops/rpm/rpm-auction-info/2014-2015-rpm-bra-results-report-addendum.ashx](http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/2014-2015-rpm-bra-results-report-addendum.ashx). There was 6,895 MW of Unforced Capacity that did not clear the auction. This figure accounts for the forced outage rate of the units in question. As an estimate of installed capacity, divided that figure by one minus the forced outage rate to get 7350 MW.

siting and constructing replacement transmission) is precisely why PJM seeks the two year advanced notice of retirement set forth in Section VI of these Comments. As noted herein, although PJM believes the EPA analysis contains some erroneous assumptions that lead to an understatement of the level of retirements, PJM does not, based on its preliminary analysis, forecast a *capacity* shortfall in the region at this time. However, PJM does anticipate that local reliability problems could well arise as a result of these retirements which would require upgrades, some of which may not be in place by the time for compliance with the Final Rule.

PJM addresses each of the aforementioned issues in turn below beginning with wholesale market assumptions, moving to reliability assumptions, and finally concluding with experience, analysis, and empirical results to date regarding coal generation retirements and the need for transmission upgrades due to generation retirements.

### **A. Wholesale Market Assumptions**

As explained above, in a wholesale electricity market context such as in PJM, existing generating units, regardless of technology and fuel type, will factor into their decision to retire or deactivate whether expected revenues from PJM markets exceed costs of continuing operation, including the costs of environmental retrofits. Conversely, new entry of generation resources, Demand Response or Energy Efficiency is expected to occur in wholesale markets when the expected return on that investment exceeds the desired return on capital. The key, underlying feature of wholesale markets for energy and capacity is that these ***retirement and new entry decisions are made in a decentralized manner based on price signals that are provided by these markets*** that signal the financial profitability of existing and new entry resources. Moreover, these decisions are based on individual generation asset owner's expectations of the future which may differ significantly from one owner to the next, and from one unit to the next.

In contrast, the Integrated Planning Model ("IPM") employed by the EPA in its resource adequacy and reliability analysis does not reflect the manner in which decisions are made in the wholesale market. The objective of the IPM is to minimize the system-wide, region-wide, or nation-wide cost of achieving resource adequacy and maintaining its representation of transmission reliability subject to the environmental constraints imposed on generating units by the Proposed Rule. In sharp contrast to market dynamics, in the IPM modeling framework employed by EPA, the retirement and new entry decisions are centralized; the decisions, are not based on market price signals and do not depend upon unit profitability or returns on investment. Rather, the decisions are based on cost and perfect foresight of future market conditions. As a consequence, the IPM model may reflect retirement and new entry decisions that differ significantly from the actual market-based retirement and new entry decisions.

Wholesale energy and capacity markets in PJM also allow for the participation of Demand Response and Energy Efficiency, and are of particular relevance in the RPM Capacity Market. In many cases these resources are lower cost capacity alternatives

than traditional generation resources and can have an effect on market prices and ultimately on the retirement and new entry decisions of generation resources when considered in conjunction with the costs imposed by the Proposed Rule.

The IPM framework does not account for Demand Response and Energy Efficiency resources as new capacity entry, nor does it account for the effect these resources may have on market prices that drive retirement and new entry decisions. And, consequently, even under the centralized decision making of cost minimization, the IPM framework is likely missing possible generation retirements that may be driven by the interaction of the Proposed Rule with these potentially lower cost capacity resources. This is not to say that Demand Response and Energy Efficiency do not provide significant benefits and could, in the right circumstances, reduce overall compliance costs and fully substitute for that retired generation as capacity resources. However, on a location-specific basis, Demand Response and Energy Efficiency may not be a complete substitute for certain of the ancillary services outlined above. As a result, an effective compliance strategy requires the examination and integration of all of these resources and adequate time to ensure their effective implementation.

In short, the IPM framework for examining the effects of the Proposed Rule on generation retirements (particularly coal) does not match up with the manner in which decisions are made nor does it recognize the full range of the possible resources available in the market. Therefore, the IPM framework is likely to understate the magnitude of coal generation retirements. This in turn may understate the volume of system security and local reliability issues faced by RTOs and other transmission operators.

#### **B. Reliability is More Than Moving Power between Large Geographic Regions**

As PJM has stated above, an analysis of system security requires a more granular review of the ability to ensure transmission security in load pockets. It is not sufficient to assume that because the region as a whole has sufficient resources, that local reliability is automatically maintained, as is the assumption made in the IPM framework. With respect to transmission alone, the IPM framework omits key features of the bulk power transmission system that lie within the IPM-defined regions. First, the IPM modeling of regions misses large 500 kilovolt (“kV”) reactive transfer interfaces that reside within some of the regions.<sup>29</sup> Second, some of the regions span across multiple RTOs which would neglect to account for the fact that each RTO region undertakes its own security constrained generation dispatch.<sup>30</sup> Third, the manner in which power is moved from one region to another in IPM does not account for parallel path or loop flows that occur across multiple regions and the international border between the US

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<sup>29</sup> For example, in the MAACW region, there are three 500 kV reactive transfer interfaces, Western Interface, Central interface, and the 5004-5005 interface.

<sup>30</sup> The RFCO region defined in IPM includes both PJM and MISO transmission systems.

and Canada that take careful inter-regional coordination between multiple RTOs and transmission providers to solve.

As has been documented by the Independent Market Monitor (“IMM”) for PJM in its recent State of the Market Report, the amount of generation available to be re-dispatched to alleviate localized constraints to maintain transmission security in these areas is small, sometimes only one or two generating units have the ability to relieve such localized constraints.<sup>31</sup> As the work from the IMM clearly shows, the deactivation or retirement of some generation would take away potential re-dispatch solutions and therefore likely trigger the need for transmission upgrades to prevent transmission reliability criteria violations. The possibility of generation deactivations or retirements triggering transmission upgrades can be easily seen by examining the history of generator deactivations in PJM as well as pending deactivations. The lists of historic and pending deactivations are publicly available and show that of all the pending deactivations, more than half require transmission upgrades to allow the unit to retire without a violation of transmission reliability criteria.<sup>32</sup> In the case of the Benning Road and Buzzard Point units, which are in Washington, D.C. -- a locationally-constrained area -- the transmission reinforcements necessary to mitigate the reliability impacts of such retirement are scheduled to take more than 5 years to place in service.<sup>33</sup>

At this time, there are only 3,262 MW of all generation types with requests for deactivation pending. Most of these require the installation of some type of transmission upgrade to allow those units to retire without any transmission reliability criteria violations. If there are considerable coal generator deactivations as a result of the Proposed Rule, there is a high probability that many of these units can only be reliably retired once transmission upgrades are placed into service. Moreover, if the sheer volume of retirements is large, in contrast to the results reported by EPA in its analysis, there may be a deleterious effect on local transmission reliability resulting from the set of collective retirements; impacts that may not have been triggered with only a small set of unit retirements. As noted below, given the limited time period for notice of deactivation and the uncertainty concerning the contents and effective date of the Final Rule, generation owners have been reluctant to announce firm plant retirement decisions. This delay then further complicates decisions by PJM to plan and direct installation of the appropriate set of transmission upgrades.

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<sup>31</sup> See, e.g., Section 7 p.483 Table 7-5 Congestion summary (By facility type): Calendar year 2010. The 2010 State of the Market report prepared by the IMM in the PJM region, Monitoring Analytics, can be found at the following link:

[http://www.monitoringanalytics.com/reports/PJM\\_State\\_of\\_the\\_Market/2010/2010-som-pjm-volume2.pdf](http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2010/2010-som-pjm-volume2.pdf)

<sup>32</sup> See <http://pjm.com/planning/generation-retirements.aspx>. There are other deactivation requests that would have resulted in even more transmission reliability violations but for previously approved RTEPP upgrades that are scheduled to go into service by the time the units will deactivate.

<sup>33</sup> See the deactivation study related to the Benning Road and Buzzard Point units at the following URL: <http://pjm.com/planning/generation-retirements/~media/planning/gen-retire/20070531-buzzard-evaluation.ashx>

### **C. Concerns with EPA's Analysis of the Breadth of Generating Unit Retirements in PJM**

In its resource adequacy and reliability analysis, EPA has estimated that at most only 1,090 MW of coal capacity will retire by 2015 in the PJM region with the implementation of the Proposed Rule.<sup>34</sup> With such a low estimate of retiring coal capacity, the probability of local reliability issues – if the EPA had analyzed such issues – would also be potentially much smaller so that the assumption of deliverability of energy within any of the IPM-defined regions would not appear to be so critical.

The reality regarding the magnitude of coal capacity retirements, however, may well be quite different based on market indicators to date. One indication of the ability of any type of generating capacity to be financially viable moving forward is whether or not it has cleared (been committed) in PJM's RPM Capacity Market auctions. Environmentally-challenged capacity that does not consistently clear in the three-year ahead Base Residual Auction is not likely to continue in service since capacity market revenues are such an important source of revenues for these units as they determine whether or not to retrofit.<sup>35</sup> PJM already knows that as a result of the 2014/2015 RPM Base Residual Auction there was approximately 7,350 MW less coal-fired generation that cleared than in the previous 2013/2014 Base Residual Auction. In other words, there are strong indications, based on their economic position that approximately 7,350 MW of installed coal-fired capacity could retire if this trend continues. This is almost seven times that amount of capacity that EPA estimated would retire in response to the Proposed Rule.

In addition to coal-fired capacity that did not clear in the 2014/2015 BRA, there is also coal-fired capacity in PJM that serves as Capacity Resources designated through the Fixed Resource Requirement ("FRR") option that allows load serving entities to satisfy their capacity obligations outside of the RPM Capacity Market framework. This capacity is located in the areas served by American Electric Power and public power entities within the American Electric Power transmission zone. To date there have been public announcements of approximately 7,000 MW of installed coal-fired capacity that have been announced for retirement by FRR entities for the 2014/2015 delivery year in PJM due to the Proposed Rule.<sup>36</sup>

Between the reduction in cleared coal-fired capacity in the last Base Residual Auction and the public announcements by FRR entities, there is just over 14,000 MW of

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<sup>34</sup> In fact, this is likely an overestimate since there is overlap between PJM and MISO in one of the IPM defined regions.

<sup>35</sup> Under PJM's RPM rules, units are required to offer into the RPM auction with only very limited exceptions.

<sup>36</sup> AEP plans to retire approximately 6,000 MW of coal-fired generation: [AEP Press Release June 9, 2011](#), Duke Energy plans to retire approximately 1,000 MW of coal-fired generation: [Duke Energy Press Release July 15, 2011](#). Duke Energy Ohio and Duke Energy Kentucky are scheduled to integrate into PJM on January 1, 2012.. <http://www.aep.com/environmental/news/?id=1697>, <http://www.duke-energy.com/news/releases/2011071501.asp>

coal fired capacity at risk for retirement by 2015 due to the cumulative effect of various EPA proposed rulemakings including the subject Proposed Rule, as well as due to economics. What remains unknown is the extent to which, based on today's capacity prices, new, cleaner generation comes on line 2014/2015 RPM BRA delivery year and the extent that new DR and EE resources both develop and commit to serve as capacity resources in the RPM Capacity Markets.

PJM's preliminary analysis of potential coal-fired generator retirements identifies approximately 20,000 MW of coal-fired capacity less than 400 MW in the PJM region that is more than 40 years old and that will require some kind of environmental retrofit to continue forward.<sup>37</sup> Because such units are small and old, they are likely already not very efficient and do not operate as often as larger and more recent vintage coal units, so these smaller, older units are likely candidates for retirement.

This analysis further indicates that PJM's system includes at least 11,000 MW of coal-fired capacity where the estimated cost to install the necessary retrofits will exceed the present projection of building a new efficient unit (known as the Net Cost of New Entry or "Net CONE"). Net CONE is a value that reflects the nominal levelized cost to build a new natural gas fired combustion turbine. Because it would be less costly to build a new natural gas fired combustion turbine than retrofit these units, this capacity appears not competitive with new entry resources and thus may be at greatest risk for retirement.<sup>38</sup>

Additionally, PJM has identified another 14,000 MW of coal-fired capacity where the estimated costs of required retrofits fall between one-half the Net CONE and Net CONE. These units may be financially viable to continue forward with retrofits, but it is difficult to assess the risk of retirement from this group as such decisions will be influenced by other factors and information that is unique to each generation owner, and to which PJM does not have access.

The empirical evidence of apparent and likely retirements and PJM's own analysis points to a volume of potential retirements that could well be more than 10 times the amount of capacity that the EPA has estimated in response to the Proposed Rule. PJM is not saying that retirement of aging costly generation is on its face a negative---overall, it is not. However, given the magnitude and timing of this level of retiring generation, PJM estimates that a number of local reliability issues not identified in EPA's analysis will occur which will require transmission upgrades or other solutions. This magnitude and timing of potential retirements is unprecedented in the PJM region. The full effects will not be known until the full set of unit retirements is announced so that PJM can conduct the necessary studies to determine the extent of the local

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<sup>37</sup> PJM will be posting the results of its analysis, once available, on its website at [www.pjm.com](http://www.pjm.com).

<sup>38</sup> The economic analysis only examines generation in PJM prior to the ATSI and DEOK integrations as PJM does not have sufficient historic revenue information for these units to do an accurate assessment of their financial viability to continue forward with retrofits.

reliability problems and identify the potential transmission solutions. However, the prospect of a number of retiring units, the insufficient forward notice of retirement as explained in Section I.A. above, and the prospect of PJM not being able to ensure that the necessary transmission upgrades or replacement resources can all be placed into service within the timeframe of the Proposed Rule compels PJM to recommend its unit-specific reliability safeguard process outlined in Section VI below.

#### **D. Preliminary Observation: Resource Adequacy and System Security**

Even with as much as 11,000 to 14,000 MW of coal-fired capacity at risk for retirement, resource adequacy (*i.e.*, the overall level of capacity needed to serve the RTO's needs) does not seem to be immediately at risk. First, for the 2014/2015 delivery year with approximately 7,350 of coal-fired installed capacity not clearing, PJM projects a 19.6 percent installed reserve margin which is approximately 6,400 MW of installed capacity over and above the target installed reserve margin.<sup>39</sup> The primary reason for this is that the demand forecast has fallen and Demand Response resources have made up the difference. Even accounting for the retirement announcements of FRR entities and announced new generation plans, there do not presently appear to be significant issues in maintaining capacity levels at the installed reserve margin in the short term.<sup>40</sup> In the 2014/2015 Base Residual Auction there was an increase of 4,800 MW of Demand Response resources over the previous auction. If that trend continues and combined with the potential development of new generation as evidenced by PJM's generation interconnection queue, there appear to be adequate reserves assuming new generation can be attracted, sited, and built in a timely manner. However, as explained above, resource adequacy and operating reliability, *i.e.*, system security, are very different issues, and the sheer volume of retirements and associated local reliability problems are the main near-term issue as the compliance deadline of January 1, 2015 approaches.

#### **V. SPECIFIC COMMENTS ON THE PROPOSED RULE'S FINDINGS REGARDING ADDRESSING RELIABILITY IMPACTS**

In this section, PJM provides specific comments to certain of the EPA's factual findings in Section V.M. of the Notice that are cited in support of the overall finding that the Proposed Rule will not adversely impact reliability. PJM recognizes that the provisions of Clean Air Act section 112 limit EPA's ability to provide blanket extensions beyond the three year schedule (with an additional one year extension for the installation of controls) ("the 3+1 schedule"). In PJM's proposed remedy, contained in Section VI below, PJM sets forth its specific proposal, which is entirely consistent with Clean Air Act section 112. PJM's proposed remedy represents the best means to

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<sup>39</sup> 2014-2015 Reliability Pricing Model Base Residual Auction Results Report at 1, <http://www.pjm.com/markets-and-operations/rpm/~media/markets-ops/rpm/rpm-auction-info/20110513-2014-15-base-residual-auction-report.ashx>.

<sup>40</sup> The approximate cushion covers the announced retirements and Duke Energy Ohio and Kentucky, which will integrate into PJM in January 2012, has announced new build gas with their retirements

harmonize the Final Rule with Congress' directives to ensure the maintenance of reliability of the bulk power electric grid while achieving its Clean Air Act directives.

Each relevant EPA finding is reprinted with PJM's comment immediately below that reprint.

**EPA Finding Para. M, Federal Register p. 25054:**

*"CAA section 112 specifies the dates by which affected sources must comply with the emissions standards. Existing sources may be provided up to 3 years to comply with the final rule; if an existing source is unable to comply within 3 years, a permitting authority has the discretion to grant such a source up to a 1-year extension, on a case by case basis, if such additional time is necessary for the installation of controls. We believe that the requirements of the proposed rule can be met without adversely impacting electric reliability. Our analysis shows that the expected number of retirements is less than many have predicted and that these can be managed with existing tools and processes for ensuring continued grid reliability."*

**PJM Comment:**

PJM has pointed out above the limitations of the reliability modeling presented by EPA. PJM does not posit that, as a result of those limitations, the impacts set forth by EPA are *per se* incorrect---rather, given the fact that the full impact of the Proposed Rule and the resulting generator decisions on whether to comply or retire have not been made, it is simply premature to reach a definitive conclusion that, in all cases, "*the proposed rule can be met without adversely impacting electric reliability*<sup>41</sup>." As noted above, there are many aspects of reliability -- ranging from overall capacity adequacy in an entire region to local reliability impacts from plant retirements -- which require much more specific analysis than has been able to be performed to date. Moreover, although EPA's analysis addresses overall system adequacy, a second critical aspect of reliability, namely system security, has not been analyzed under the Proposed Rule.

PJM does not make this observation as a blanket criticism of EPA's analysis. Rather, PJM points out that the information needed to undertake this more granular analysis cannot be meaningfully performed until further information is known as to individual unit's retirement decisions.<sup>42</sup> As a result, PJM believes that the EPA's findings as quoted above are sweeping and summary in nature and thus EPA would have difficulty meeting the reasoned-decision making standard for judicial review.

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<sup>41</sup> Proposed Rule at 25054.

<sup>42</sup> In Section VI below, PJM proposes a remedy to this "chicken and egg" problem by seeking a requirement for early and timely notification to EPA and the RTO of individual unit's plans to comply or retire.



**EPA Finding Para. M, Federal Register p. 25054:**

*“There are already tools in place (such as integrated resource planning, and in some cases, advanced auctions for capacity) that ensure that companies adequately plan for, and markets are responsive to, future requirements such as the proposed rule.”*

**PJM Comment:**

As noted above, generation adequacy has largely been deregulated at the wholesale level. In many cases, as the Tariff provides, PJM receives only 90 days notice of retirements and FERC has affirmed that PJM has no ability to stop a unit from retiring.<sup>43</sup> Moreover, most of the states in the PJM footprint do not have authority to develop and, more importantly, order the results of state-developed integrated resource plans (“IRP”).<sup>44</sup> For instance, it is PJM’s understanding that IRP is not utilized across the entire PJM footprint in the manner EPA assumed in its analysis. Several states in PJM rely on competitive markets for utility procurement of generation supply to serve customers not served by competitive retail suppliers. As a result, EPA’s reliance on integrated resource planning as a *“tool in place that ensures that companies adequately plan for, and markets are responsive to, future retirements such as the proposed rule”* is inconsistent with the law and/or policies of a number of the state commissions within the PJM footprint and therefore cannot be relied upon as a justification for the 3+1 deadline.

The Notice also references *“advanced auctions for capacity”* as another means to *“ensure that companies adequately plan for, and markets are responsive to, future requirements such as the proposed rule”*. In the case of PJM, the EPA is correct in referencing the fact that PJM runs a three-year forward auction for capacity – RPM. RPM acquires resources for capacity three years into the future. While this auction addresses the resource adequacy aspect of reliability in PJM, it does not necessarily focus on the local transmission security within Locational Deliverability Areas (“LDAs”). The three year forward auction does force a unit to determine its compliance strategy in a timely maner as it is required to either bid in the unit (and thus legally be obligated to PJM to be able to be called on to supply energy three years forward) or not submit a bid based on its decision to retire the unit. A unit could enter into the RPM auction each year with the intent to retrofit but then end up not clearing and ultimately retiring once it weighs the cost of retrofits vs. the forward capacity price it would have received had it cleared in the PJM capacity market along with energy market revenues it might have earned. Additionally, a unit that clears the auction and later decides to retire can either pay a penalty or contract for replacement capacity, both options of which may be more economical than the cost to keep the unit running to meet its obligations. As such, PJM’s forward capacity market, although a helpful tool, cannot, in and of itself, ensure that the effects of the rule are fully dealt with in the marketplace with sufficient advanced notice to address the development of alternatives. Moreover, in some cases retrofits may need more than three years for completion. In short, the limited three year forward

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<sup>43</sup> *PJM Interconnection, L.L.C.*, 110 FERC ¶ 61,053 at P 137 (2005).

<sup>44</sup> *Nantahala Power & Light v. Thornburg*, 476 U.S. 953 (1986).

capacity market is a helpful but not dispositive tool to allow the market to respond to the impact of the Proposed Rule.

**EPA Finding Para. M, Federal Register p. 25054:**

*“EPA believes that the ability of permitting authorities to provide an additional 1 year beyond the 3-year compliance time-frame as specified in CAA section 112, along with other compliance tools, ensures that the emissions reductions and health benefits required by the CAA can be achieved while safeguarding completely against any risk of adverse impacts on electric system reliability.”*

**PJM Comment:**

PJM believes that there is no record basis for EPA’s sweeping conclusion that the 3+1 compliance period in the Proposed Rule “*safeguards completely*” against any adverse impacts on electric system reliability. As noted previously, the local reliability impacts of the Proposed Rule are unknown and the larger regional adequacy impacts can only be determined once the impact of the Final Rule has been analyzed and units have made their individual retrofit vs. retirement decisions. PJM’s preliminary analysis as described above indicates that the number and size of retirements in EPA’s analysis is significantly understated.

PJM appreciates the EPA’s recognition of the concern and has proposed a reliability safeguard as set forth in Section VI below. PJM believes that adoption of this safeguard proposal is necessary to meet the rule’s goal of “*safeguarding completely against any risk of adverse impacts on electric system reliability.*” Without such a backstop, PJM believes there is inadequate record support for the finding and more importantly, the potential that the Proposed Rule could damage rather than “*safeguard completely*” electric system reliability.

**EPA Finding Para. M, Federal Register p. 25054:**

*“Between proposal and final, EPA will work with DOE and FERC to identify any opportunities offered by the authorities and policy tools at the disposal of DOE and/or FERC that can be pursued to further ensure that the dual goals of substantially reducing the adverse public health impacts of power generation, as required by the CAA, while continuing to assure electric reliability is maintained. EPA also intends to continue to work with DOE, FERC, state PUCs, RTOs and power companies as this rule is implemented to identify and address any challenges to ensuring that both the requirements of the CAA and the need for a reliability electric system are met.”*

**PJM Comment:**

PJM appreciates EPA’s acknowledgment and invitation to work with the agency on ensuring that the Final Rule meets the dual goals of Clean Air Act compliance and ensuring electric system reliability. PJM does believe that certain policy initiatives can

be implemented amongst the agencies to help ensure compliance and reliability. These include the EPA incorporating into the Final Rule the Secretary of Energy's authority under section 202c and ensuring that his exercise of authority, after coordination with EPA, does not leave a complying entity subject to penalties from either state officials or citizen lawsuits under the Clean Air Act.

PJM further urges the EPA to work with RTOs *prior to* the Final Rule going into effect so that the proposals presented herein and similar ones can be addressed in a manner which ensures that the Final Rule does not impair reliability. PJM believes that it is critical that appropriate safeguards and backstops be included in the Proposed Rule rather than having the EPA wait to work with the RTOs on such measure only until after the rule's final issuance. For its part, PJM stands ready to work with EPA, FERC, the State air authorities and others to ensure that any Final Rule can be implemented in a manner that is cognizant of the critical need to ensure maintenance of bulk power reliability during this period.

PJM also urges the EPA to work with State air authorities as the environmental permitting entities, to implement compliance schedules for individual facilities where appropriate to maintain electric system reliability.

**EPA Finding Para. M, Federal Register p. 25055:**

*“(T)he additional 1-year extension would provide an additional two shoulder periods to schedule outages. It also provides additional opportunity to spread complex outages over multiple outage periods. EPA believes that while many units will be able to fully comply within 3 years, the 4<sup>th</sup> year that permitting authorities are allowed to grant for installation of controls is an important flexibility that will address situations where an extra year is necessary.”*

**PJM Comment:**

PJM has the authority to approve all unit scheduled outages to ensure that such outages do not adversely impact reliability, but cannot prevent generators from taking outages when they believe they need to tie in pollution control retrofits. PJM appreciates EPA's recognition of the need to spread complex outages over multiple outage periods. As the breadth of the outages and the availability of retrofit materials may impact the scheduling of outages, it is not clear that the proposed 3+1 timeline provides sufficient flexibility for PJM to manage all of these outages in a staggered manner.

For instance, once the need for transmission upgrades have been identified to permit the safe deactivation of a given generator, PJM's Tariff requires that Transmission Owners and Interconnection Customers coordinate all transmission system outages with PJM to permit those upgrades to be constructed, in accordance with the PJM System Operations outage planning procedures.

In short, outage windows to accommodate upgrade construction are limited to opportunities when prevailing system conditions permit so that operational reliability is not compromised.

Transmission Owners provide notice of planned outages to PJM in accordance with the requirements in the PJM Tariff and, if applicable, under the TOA. Required notice is defined as (1) notification of planned outage schedules six months in advance for transmission outages which are expected to exceed five days, and (2) notification of all transmission outages five working days or less by the first day of the month proceeding the month of the outage.

Under certain conditions such as extreme weather, peak load, heightened homeland security, *etc.*, PJM will evaluate the need to operate the grid in a more conservative manner. Actions that may be taken in these special circumstances include, but are not limited to, canceling or rescheduling outages and returning outaged equipment to service.

Moreover, Transmission Owners are to avoid scheduling any outage in excess of 5 days in duration with no or greater than 5 day restoration time that may result in increased risk to system reliability during peak summer and winter periods. These periods are defined as June 15 – August 31 and January 1 – February 28, respectively. These outages include those that may result in:

- Actual or post-contingency thermal or voltage issues with insufficient generation for control
- Constraints that are load sensitive with limited controlling actions
- Stability issues or bottled generation

Transmission Owners screen for such outages prior to submittal and look to reschedule during shoulder months. PJM also screens for such outages when performing outage analysis. Transmission Owners are encouraged to schedule non-impactful outages during peak seasons.

Thus, given the details around PJM's FERC-approved outage process, this is an issue which requires timely and early notice from unit owners and a willingness of EPA to potentially extend the compliance deadlines to accommodate challenges in scheduling outages while still maintaining system reliability. PJM's proposed remedy outlined in Section VI below is thus a vital component to ensuring that EPA's observations concerning the importance of staggering complex outages can actually be effectuated in a manner which ensures system reliability.

**EPA Finding Para. M, Federal Register p. 25055:**

*“EPA believes that it is reasonable to allow the (one year) extension to apply to the replacement (of existing units) because EPA believes that building of replacement power could be considered “installation of controls” at the facility.”*

**PJM Comment:**

PJM supports EPA's reading of the statute to allow the additional one year for compliance when there will be installation of replacement power – which is viewed as equivalent to installing pollution controls -- at the site of a where a generating unit is being retired. Such a reading works to effectuate the ability of owner's to install, within a four year period, cleaner replacement generation in lieu of being forced to retrofit units which are most likely near the end of their useful lives. Moreover, the availability of a new unit may prove far more reliable than attempting to retrofit units which already are at the end of their useful lives. This same rationale should apply to a situation where the additional one year (or longer) is needed to install replacement generation or DR and EE at another location; as well as when a transmission reinforcement is needed to mitigate the reliability impacts of a retiring generating unit.

**EPA Finding Para. M, Federal Register p. 25055:**

*“Reliability concerns caused by local transmission constraints can be addressed through a range of solutions...For instance, in the PJM Interconnection (an RTO) region, there are over 11,600 MW of capacity that have completed feasibility and impact studies that could be on-line by the third quarter of 2014.”*

**PJM Comment:**

As a basis for its finding, the Proposed Rule cites to a presentation made by PJM in January, 2011. While the relevant presentation did state amount of proposed generation in PJM's interconnection queue, this was in regards to addressing the resource adequacy aspect of reliability, and not necessarily the transmission security or local reliability aspect. So, while these resources provide the needed system capacity, it will not be known until local transmission constraints arise and are studied if these resources can address local issues.

**EPA Finding Para. M, Federal Register p. 25055:**

*“These type of resources (Demand Side response and energy efficiency) can be developed very quickly. In 2006, PJM Interconnection had less than 2,000 MWs of capacity in demand side resources. Within 4 years this capacity nearly quadrupled to almost 8,000 MW of capacity.”*

**PJM Comment:**

It is true that Demand Response and Energy Efficiency can provide significant benefits and can, in the right circumstances, reduce overall compliance costs, on a location-specific basis. However, Demand Response and Energy Efficiency may not be

a complete substitute for certain of the ancillary services outlined above, nor be in the right location to mitigate local reliability issues. Moreover, PJM cannot mandate the expansion of DR and EE as these are market driven decisions. As a result, an effective compliance strategy requires the examination and integration of all of these resources, to the extent they are market driven, and adequate time to ensure their effective implementation of transmission solutions to local reliability problems in the event that new entry resources do not solve local reliability problems.

**EPA Finding Para. M, Federal Register p. 25055:**

*“Recent experience also shows that transmission upgrades to address reliability issues from plant closures can occur in less than 3 years.”*

**PJM Comment:**

The EPA does not cite any support for this sweeping conclusion. Just because transmission upgrades “can” occur in less than 3 years, does not mean that they will occur on such timetable in all circumstances. For instance, certain local reliability upgrades such as those that entail upgrades to existing substations can certainly occur in an expeditious manner. However, the kind of transmission upgrades that could be triggered by the retirement of Reliability Critical Units in congested portions of PJM would necessarily involve far more complex projects with extended delays due to the siting process.

For example, the Susquehanna-Roseland line is currently being held up by federal agency review. The need for this backbone transmission line was first identified by PJM and approved by the Board as part of 2007 RTEPP. At that time, the line was anticipated to be in service for 6/1/2012 to avoid identified reliability criteria violations. However, delays due to National Park Service review have delayed the in-service date of this line to 2015 at the earliest.<sup>45</sup> Similarly, the retirement by Exelon Generation of the Cromby Unit 2 and Eddystone Unit 2 requires 18 separate transmission system enhancements are required to address the identified thermal, voltage and short circuit violations. Thus, even though Cromby and Eddystone provided notice of deactivation in December, 2009, due to the need for such transmission enhancements the units are not going to actually shut down until May, 2012. In the interim, their operation is environmentally limited.<sup>46</sup>

Finally, the Benning Road and Buzzard Point generating units totaling 790 MW – located in the Potomac Edison Power Company’s zone in Washington, D.C. – put it its deactivation request with PJM in February, 2007. Transmission reinforcements necessary to allow these generating units to retire, which include new circuits, upgrades

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<sup>45</sup> <http://pjm.com/planning/rtep-upgrades-status/backbone-status/susquehanna-roseland.aspx>

<sup>46</sup> <http://www.pjm.com/planning/generation-retirements/~media/planning/gen-retire/pending-deactivation-requests.ashx>

to existing circuits, new transformers, new capacitors and upgrades to existing terminal equipment, are not expected to be in service until more than five years after such notice in May, 2012.

**EPA Finding Para. M, Federal Register p. 25056:**

*“Furthermore, if companies within an RTO/ISO wish to retire a unit, they must first notify the RTO/ISO in advance so that any reliability concerns can be addressed. The RTOs/ISOs have well established procedures to address such requirements.”*

**PJM Comment:**

As indicated above, the notification procedures are simply not adequate to meet the magnitude of changes and potential retirements that could result from implementation of the Proposed Rule. Although PJM is planning a filing at FERC to address certain reforms in its planning process which would ensure planning for “at risk” generation, even if PJM were successful in having those reforms approved by FERC, it would still require that the Final Rule be flexible enough to complement rather than work against those FERC-approved changes. PJM’s proposed remedy outlined below will allow for this harmonization of the rule with changes in the planning process undertaken at PJM and the need to maintain system reliability during this important period.

**EPA Finding Para. M, Federal Register p. 25056:**

*“The RTOs/ISOs also have a very important role to play and it appears that a number of them are already engaged in preparing for these rules. For instance, PJM Interconnection considered the impact of these anticipated rules at its January 14, 2011, Regional Planning Process Task Force Meeting, and Midwest Independent Transmission System Operator, Inc. (MISO) has also begun a planning process to consider the impact of EPA rules.”*

*As discussed above, given the large reserve margins that exist, even after consideration of requirements of the proposed rule, EPA believes that any reliability issues are likely to be primarily local in nature and be due to the retirement of a unit in a load constrained area. As demonstrated by the work that PJM Interconnection and MISO are doing, RTOs/ISOs are required to do long range (at least 10 years) capacity planning that includes consideration of future requirements such as EPA regulations”.*

**PJM Comment:**

PJM appreciates the EPA’s recognition of the important role of RTOs but believes that EPA has underestimate the local impacts of generation retirement on system security. In fact, it is PJM’s important role concerning the reliability of the bulk power grid that necessitates PJM’s Comments and Proposal contained herein.

Through the Regional Planning Process Task Force (“RPPTF”), PJM is engaged with its stakeholders in examining macro system-wide backbone transmission adequacy needs to serve load absent “at-risk” generation and meet NERC Loss-of-load-expectation standards. RTO/ISO long-range capacity planning ensures these standards are met. Moreover, PJM capacity planning does not entail the ability to compel the construction of NEW generating resources to replace resources which deactivate, let alone where, by when and how much; that is the province of market forces. RPPTF discussions do not address the specific reliability impacts of specific deactivated generation; PJM studies of “at-risk” generation are broadly conceived so as to avoid pre-determining or influencing a specific asset owners business decisions; thus to imply that PJM knows 10-years out which specific generators are going to retire is speculative and would put PJM in the position of endangering the competitive position of a specific owner’s specific asset(s).

**EPA Finding Para. M, Federal Register p. 25056:**

*“The RTOs/ISOs should consider the full range of options to provide any necessary replacement power including the development of both supply and demand side resources.”*

**PJM Comment:**

Here again, EPA’s finding pre-supposes that the necessary transmission capability is in place to import this replacement power, which is in essence what the PJM’s assessment of a deactivation request encompasses. Furthermore, as noted previously, PJM cannot compel the addition of generation or use of DR or EE.

**EPA Finding Para. M, Federal Register p. 25055:**

*“EPA’s assessment looked at the reserve margins in each of 32 subregions in the continental U.S. It shows that with the addition of very little new capacity, average reserve margins are significantly higher than required (NERC assumes a default reserve margin of 15 percent while the average capacity margin seen after implementation of the policy is nearly 25 percent). Although such an analysis does not address the potential for more localized transmission constraints, the number of retirements projected suggests that the magnitude of any local retirements should be manageable with existing tools and processes.”*

**PJM Comment:**

PJM agrees, the analysis does not address the potential for more localized transmission constraints as PJM explained more fully above. The fact that potential retirements have been understated, combined with the fact PJM could have as little as 90 days notice of retirement under its current FERC-approved rules, renders EPA’s conclusion that adequate resources will exist incomplete and erroneous.



## **VI. PJM PROPOSED REMEDY TO SAFEGUARD RELIABILITY WHILE ENSURING TIMELY COMPLIANCE**

PJM proposes the following Reliability Safeguard addition to the Proposed Rule to address, in a targeted unit-specific manner, the potential that a particular retirement or upgrade or set of retirements and upgrades triggers reliability issues that cannot be adequately addressed within the Proposed Rule's compliance timeframes. PJM's proposal addresses both use of the fourth year for additional time for compliance in such instances *and* the establishment of a mechanism to allow for additional time, on a targeted unit-specific basis, if as a result of unit upgrades or retirement, local reliability issues are triggered that cannot be addressed even within the four year timeframe set forth in the Proposed Rule.

### **A. Reliability Safeguard Running to January 1, 2016**

PJM requests that EPA state either in the preamble to the Final Rule that the permitting authority should explicitly authorize or endorse the extensions to the three year compliance deadline for units which the RTO or relevant Reliability Coordinator<sup>47</sup> indicates are "Reliability Critical Units." Reliability Critical Units are those generating units, timely requesting deactivation (defined below) as a compliance response to the Proposed Rule, and subsequently identified by RTOs as units deemed critical to system reliability, including all of the ancillary services described herein. PJM believes Reliability Critical Units that have timely announced their deactivation should be eligible for a one year extension of the compliance obligation because deactivating a generating unit is simply another control option to comply with the Final Rule if the affected generating unit owner believes this is the least-cost compliance option, and is effectively no different from a generating unit choosing to install retrofits to meet the emissions rate standards that cannot get its retrofits in service by the January 1, 2015 compliance deadline. Units choosing deactivation as a compliance option would only be granted an exemption if under the RTO's independent analysis, they are deemed critical to system reliability and are required to stay in service for a defined period until transmission or replacement resource solutions could be placed into service.

### **B. Timely Notice of Retirement/Retrofit As a Condition Precedent to Availability of the Reliability Safeguard.**

PJM is keenly aware that a one year extension request, if granted, may create incentives for generation owners faced with compliance decisions to wait as long as possible to submit their deactivation requests to PJM in the hope they can get their units extended beyond the January 1, 2015 compliance deadline if their units are deemed by

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<sup>47</sup> See n. 49, *infra*.

PJM in its subsequent deactivation study to be Reliability Critical Units. Under the current PJM Tariff generators are only required to provide 90 days notice of their intent to retire which means that generating units intending to deactivate to comply with the standards established in the Final Rule, could provide notice as late as September 30, 2014. With only 90 days, it is simply not possible that the required transmission or generation solutions identified by the RTO can be put in service by January 1, 2015. Given that at that point, a Reliability Must Run Agreement is potentially the only option available to PJM, generator owners can effectively attempt to extend the life of their units for an additional year or more with no intention of installing retrofits by simply delaying their deactivation request so they can effectively side-step compliance with the Final Rule through a potential mis-use of the extension process contemplated herein. From PJM's perspective, such an outcome does not serve reliability as such units are likely quite old and have poor availability as evidenced by high forced outage rates. Consequently, PJM requests the EPA provide guidance in the Final Rule that such an extension for deactivating units *only* be granted if the unit owners provide the RTO, with a copy to the EPA with notice of deactivation by the earlier of 12 months from the effective date of the Final Rule, or January 1, 2013, a full two years in advance of the January 1, 2015 compliance deadline.<sup>48</sup>

By January 1, 2013 PJM will have conducted its 2015/2016 Base Residual Auction for Capacity Resources, and by that time generation owners will almost certainly have had to make their retrofit, repower, or retire decisions for compliance with the Final Rule based on whether or not the affected generating unit has cleared in the previous two auctions in which compliance costs could be reflected in their offers into the auction. For generating units that do not participate in RPM auctions and would otherwise be designated as capacity resources under the Fixed Resource Requirement this decision would have to be made at the same time as the 2015/2016 Base Residual Auction, and consequently those generation owners will have had to have made their compliance decision by January 1, 2013.

As a result, PJM believes that providing notice of deactivation at least 2 years prior to the compliance deadline combined with the proposed one year extension for Reliability Critical Units is prudent to allow for the development of transmission or generation solutions to identified local reliability problems on an individual generating unit basis.

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<sup>48</sup> Nothing in this proposal should be read as limiting the ability of units which are retrofitting but cannot complete such work by the compliance deadline from also being eligible for a compliance extension. The proposed "safety valve" is intended to provide a safe harbor for those retiring generators who meet the eligibility criteria – including providing the advanced notice of retirement – as outlined above. Nothing in this proposal eliminates a generating owner from petitioning the Secretary of Energy to excise its authority under Section 202(c) of the Federal Power Act and Section 301(b) of the Department of Energy Organization Act to order the unit remain operational. Nor would this preclude a generator from working with EPA to establish a compliance schedule.

**C. Availability of Additional Extensions Beyond the Four Year Period Upon Certification by the RTO of Reliability Problems Resulting from Unit Retirement or Delays in Completing Upgrades**

As explained above, the scale of potential generating unit deactivations as a result of the Final Rule may create a volume of transmission reinforcements that may force some needed transmission solutions beyond the four year window set forth in the Proposed Rule. PJM has already seen 7,350 MW of installed coal capacity not clear in the 2014/2015 Base Residual Auction, and an additional 7,000 MW of coal capacity retirements have been announced by FRR entities in PJM. Moreover, a recent PJM analysis of units at risk has independently identified approximately 11,000 MW of coal capacity that requires additional revenues to cover the cost of retrofits in excess of the Net Cost of New Entry for a natural gas combustion turbine.

Consequently, there may be instances in which solutions to reliability problems identified in a unit deactivation process could require extensions for more than one additional year and go beyond the initial four years. For Reliability Critical Units that have provided their RTO notice by the earlier of within 12 months of the date of the effective date of the Final Rule or January 1, 2013 that they intend to deactivate, but the unit owner does *not* intend to construct on-site replacement power, EPA should allow unit owners to avoid non-compliance penalties through a schedule of compliance for the period necessary for the RTO to ensure the availability of sufficient replacement resources or transmission solutions. The RTO would review these limited situations with its stakeholders through its public planning process and, through that public process, would be in a position to indicate to EPA the timeframe that is necessary to do so. PJM recognizes that ordinarily states issue Title V permits and that a schedule of compliance could be included there or, alternatively, in a consent decree. The situation would not be allowed to continue open-ended. Rather, the schedule of remedial measures proposed by the asset owner would include a mandatory shutdown on a date certain based on the public information available from the RTO. [40 C.F.R. § 70.5\(c\)\(8\)\(iii\)](#), *Sierra Club v. Johnson*, 541 F.3d 1257, 1260-61 (11th Cir 2008). PJM seeks acknowledgement and recognition by EPA that the RTO's indication that a unit, which has provided timely notice to the RTO, is a Reliability Critical Unit would be an appropriate exercise of EPA's discretion with respect to the timing of an existing generating unit's compliance with the Final Rule. PJM urges that the Final Rule allow for this contingency and establish a clear up-front process, such as described herein, so that all affected entities are: 1. aware of the importance of timely notice to the RTO and EPA and 2. are clear on how they may utilize this limited "safe harbor" option.

In a nutshell, timely notice of deactivation to the RTO and an identification that unit in question is a Reliability Critical Unit which cannot be replaced with alternative resources or transmission reinforcements in the four year time allotted would be allowed a limited "safe harbor" from penalties until the RTO indicates that adequate resources have been put in place to address the reliability concern. The RTO's findings would be developed in open stakeholder processes and made available for the EPA's (or state air permitting authority's) ultimate determination as to whether to grant such an

extension.<sup>49</sup> The specifics as to how often the unit can operate within this time period, at what levels and during what periods are best addressed on a unit-specific case by case basis. PJM pledges to work with EPA on such individual cases so that EPA has the benefit of PJM's independent reliability analysis and knowledge of grid operations.

## VII. CONCLUSION

PJM believes an upfront, well-defined process to handle these extensions beyond one year given the two year deactivation notice requirement should be extremely rare, and hopefully never used. However, acknowledging such a possibility exists, and putting a process in place in the Final Rule, is essential to provide certainty to the wholesale power market that reliability will always be maintained. Additionally, such a process enshrined in the Final Rule provides certainty to generators that may request deactivation that if they are asked to remain in service to maintain reliability, they will not face the possible liability of being deemed non-compliant with the Final Rule while providing critical reliability needs to the entire system. Such a process may entail the EPA authorizing or endorsing a schedule of compliance in the affected generating unit's Title V permit through the implementing State Authority, in coordination with the RTO; and/or a Consent Decree between EPA, the State Authority and the Generation Owner developed and signed prior to the end of the compliance period, or a formal extension through a streamlined process including EPA, and the implementing state authority working with the asset owner and the RTO to grant extensions beyond January 1, 2016.

As the preceding discussion demonstrates, the analysis supporting the Proposed Rule has underestimated the risks to reliability of electric supply in light of the hard deadlines imposed pursuant to Clean Air Act § 112. Moreover, as EPA indicated, unit owners must only give 90 day notice prior to shutdown in the PJM region, 76 FR 25056. The requirement to be in compliance three years following publication in the federal register, 40 CFR §63.9984, may result in the shutdown of certain units that are critical to the reliability of electric supply on a timeline that is faster than the time necessary to replace the power or upgrade transmission.

Thus, it is not so much the technology requirements imposed under the Proposed Rule, but rather the very tight timeframe imposed by § 112 of the CAA that is incorporated into the Proposed Rule. PJM recognizes that there are limitations on EPA's ability to depart from this timeline. This was much less of an issue when EPA proposed in the Clean Air Mercury Rule to control mercury emissions under § 111 of the Clean Air Act, because the approach was cap and trade compliance, which allowed

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<sup>49</sup> Such a process could be made available to Reliability Coordinators in non-RTO regions although in such regions the Reliability Coordinator and the unit owner could both be under a single corporate parent. As a result, more care would be needed to ensure adequate functional separation. Such issues do not arise in the RTO context since, as noted previously, the RTO is wholly independent of all market participants including unit owners.

cleaner units to offset higher emitting units.<sup>50</sup> Under the NESHAP proposal, in contrast, each existing unit must come into compliance, *i.e.* there is limited opportunity to combine units for compliance purposes or develop an overall compliance plan. As a result, PJM anticipates that there will be units where retrofitting is not cost-effective that will be shut down. Shutdown of reliability critical units before a replacement resource or a transmission solution can be accomplished could, in targeted situations, risk reliability of the delivery of electric power. These Reliability Critical Units would not have been shown in EPA's modeling because of the modeling methodology.

PJM reiterates that it is not itself requesting a blanket delay of the implementation of the Final Rule, nor is PJM requesting blanket extensions for all units requesting deactivation.<sup>51</sup> PJM is requesting EPA provide a clear process in its Final Rule is to allow for one year extensions for deactivating units if they provide a deactivation notice by the earlier of 12 months from the effective date of the Final Rule or January 1, 2013 and are deemed to be Critical Reliability Units. PJM is also requesting that this process account for the possibility that extension of more than one year beyond January 1, 2016 will be necessary for some units requesting deactivation to comply with the Final Rule due to the large potential volume of deactivation requests and the possible volume of solutions that must be put into service such they cannot all be completed by January 1, 2016.

PJM stands ready to work with EPA on this important issue and appreciates this opportunity to provide comment.

**/s/ Craig Glazer**

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<sup>50</sup> PJM recognizes that the Clean Air Mercury Rule was vacated by the U.S. Court of Appeals for the DC Circuit in *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008).

<sup>51</sup> PJM takes not position on any requests of others for a blanket extension of compliance with the Final Rule.