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FAQ Response Introduction

According to PJM Manual 34: PJM Stakeholder Process, the purpose of the Enhanced Liaison Committee process is “to provide the PJM Board of Managers (Board) and PJM Members an orderly and facilitated process to directly discuss contentious issues that were not resolved or would be extremely difficult to resolve within the Stakeholder process.” For the issue of Capacity Performance, PJM and its stakeholders will utilize this Enhanced Liaison Process. At the start of the process, PJM staff introduced a Problem Statement and a PJM Staff Proposal for purpose of discussion and input.

On August 22, 2014 and September 11, 2014, PJM facilitated Question & Answer (Q&A) sessions to review the proposal. PJM continues to receive and process stakeholder questions and action items. The questions and action items are managed via a tracker and are updated bi-weekly, Tuesday and Friday, on the Enhanced Liaison Committee - Capacity Performance page. The Capacity Performance Action Items and Frequently Asked Questions (“Capacity Performance AI and FAQ”) tracking document contains the complete list of questions and action items submitted to PJM by stakeholders.

This Capacity Performance FAQ Response document complements PJM’s draft proposal and problem statement; seeking to promote a continued understanding of the proposal and encourage on-going discussions with stakeholders and staff. Focused on addressing stakeholder-submitted questions, this document also highlights key areas for further input during the enhanced liaison process. It is important to recognize that information provided in this document, as well as in the Capacity Performance AI and FAQ tracking document, is being provided by PJM to facilitate the on-going discussion and development of the Capacity Performance proposal, and such information could change as the discussion progresses.

Capacity Products

Capacity Performance is an enhancement to the requirements placed on a significant portion of the annual resources procured via PJM’s Reliability Pricing Model (RPM). The enhancement seeks to value a higher level of both availability and operational flexibility on qualified resources. The proposal develops a more robust definition of capacity resources that are relied upon to meet peak demand. In its proposal, PJM, through its role as the regional grid operator, is more precisely articulating the resource characteristics that are of the most value when meeting demand under peak conditions.

In the winter of 2014, up to 22 percent of capacity committed to PJM through RPM for the 2013/2014 Delivery Year was unavailable due to cold weather-related problems. PJM’s analysis shows that if the PJM Region experiences a comparable rate of generator outages and gas/electric coordination issues in the 2015/16 Delivery Year, coupled with extremely cold temperatures and expected coal retirements, it would likely prevent PJM from meeting its peak load requirements.

Through this enhanced definition, PJM proposes to increase the certainty of resource availability by sending the appropriate market signal to the most reliable category of capacity resources. What’s more, this new product can
incent investment in existing resources that could become more reliable through this enhanced definition. On an operational basis, the Capacity Performance standard enables: fuel security through a dependable fuel source; enhanced operational performance during peak periods; high availability of generation resources; and, flexible resource operational parameters.

Section II of the PJM Staff Proposal outlines the modifications to its market structure that PJM is proposing to add with this enhanced capacity category – Capacity Performance. The section defines the characteristics for generation resources, energy storage resources, qualifying transmission upgrades, demand resources and energy efficiency resources to meet product eligibility. This section also reinforces the existing definition of the annual capacity product to ensure that the reliability of the grid will be maintained through the current industry fuel transition and beyond.

**What types of resources can qualify as a Capacity Performance product under PJM’s proposal?**

So long as the resource owner certifies that the outlined eligibility requirements will be met, generation resources, energy storage resources, energy efficiency resources, and demand resources can qualify to offer as a Capacity Performance resource.

**What are the eligibility requirements for a generation resource to qualify to offer as a Capacity Performance resource?**

Generation capacity resources must be capable of running during any 16 hour period of each Operating Day, for three consecutive days throughout the Delivery Year; including holidays and weekends. This, however, is the eligibility requirement to offer. Once committed as a Capacity Performance resource, the actual need to run would depend on conditions such as the weather, load levels, and the capacity margins available.

This eligibility requirement is an operational performance standard, and is open to all applicable generation resources. However, resources that do not meet their performance obligations in operation, consistent with their RPM commitments, will be subject to the performance penalty outlined in Section VII.

One method of meeting the Capacity Performance eligibility requirements is to have on-site fuel or dual fuel back-up capability. Gas-fired units may also meet the requirement by securing transportation arrangements that ensure delivery which can be met through a variety of options. PJM is not mandating any particular method of ensuring performance, but rather is providing transportation as an example. Regarding the specific duration of those arrangements, it is up to each resource owner to manage fuel supply decisions relative to performance penalty risk considerations. Market participants will confirm their satisfaction of this requirement via an officer certification acknowledging that the minimum eligibility requirements will be met, with the ability for PJM to audit as necessary. If PJM believes the officer certification was misrepresented at the time it was submitted, the market participant may be in violation of, and could be subject to penalties under, PJM and FERC rules.

**How do the market rules recognize the interaction between the Capacity Performance resources and the Base Capacity resources for the same generation resource?**
Each resource, provided it is capable of meeting the Capacity Performance eligibility requirements, is capable of qualifying different portions of its capacity value as either a Capacity Performance resource or a Base Capacity resource. This enables the Market Seller to bid different volumes and prices into different resource types that would clear for separable segments of its capability.

PJM’s proposal does not include a price floor on the Capacity Performance resource. If the Capacity Performance constraint is not binding it is possible the categories of capacity could clear at the same price similar to the way Annual and Extended Summer Demand Resource products have cleared at the same price in the past.

Regarding the penalty structure for a generation resource committed under both categories of capacity, the Hourly Energy Penalty would be based on the MW shortfall of each category. The total unit shortfall would be allocated to each capacity category pro rata based on MW cleared as each category. If, for instance, a 100 MW unit clears as 60 MW Capacity Performance and 40 MW as Base Capacity, a 10 MW shortfall would be treated as 6 MW-shortfall in Capacity Performance and 4 MW-shortfall in Base Capacity.

**What are the RPM must offer requirements around the Capacity Performance category for generators?**

At this point the PJM proposal does not include a must offer requirement for Capacity Performance. PJM proposes that the existing must offer requirement for Base Capacity will remain. In other words, a resource that cleared as Capacity Performance in a prior RPM Auction would still have a capacity must offer obligation, but it would not be required to offer again as a Capacity Performance resource. However, resources would be able to make coupled offers as Base Capacity and Capacity Performance.

**How are hydro resources handled under the Capacity Performance proposal?**

Pumped storage resources are dispatchable and controllable. Provided they meet the Capacity Performance eligibility requirements, Market Sellers can offer all or a portion of their capacity from pumped storage resources as a Capacity Performance resource. Run-of-river hydro would appear to PJM to be primarily a Base Capacity resource, but owners of run-of-river hydro plants may offer such resources as Capacity Performance if they believe and can represent that they meet the eligibility requirements.

**How do environmentally limited resources meet the Capacity Performance criteria?**

To qualify as a Capacity Performance resource, environmentally limited resources must be able to perform at the equivalent of at least 10 percent capacity factor over the entire Delivery Year. This capacity factor was chosen to reflect the limited hours Cold and Hot Weather alerts are called per annum; a number which has never exceeded 876 hours. While certain units are restricted in their annual hours of run time, they may otherwise be capable of achieving the Capacity Performance eligibility requirements.
What are the eligibility requirements for a demand resource to qualify as Capacity Performance?

Annual demand resources eligible to achieve load reductions to their reduction Installed Capacity (ICAP) value for at least 16 hours per day for three consecutive days when called upon by PJM. The resource must be available to be called on all hours of the Delivery Year.

What are the eligibility requirements for an energy efficiency resource to qualify as Capacity Performance?

Energy efficiency resources, qualified under PJM Manual-18, and the PJM Open Access Transmission Tariff (Tariff), are eligible to qualify as Capacity Performance, provided such reductions are sustained year-round.

Annual energy efficiency with demand reduction in non-summer periods equal to or exceeding summer demand reduction can be offered as either Base Capacity or Capacity Performance. Note, however, in case the final nominated energy efficiency value is short of the commitment the penalty for energy efficiency cleared as Capacity Performance may be higher than for energy efficiency cleared as Base Capacity.

Methodology for Establishing Maximum Product Quantities

The PJM staff proposal identifies that capacity categories other than Capacity Performance have the potential for limited availability. To address this limitation, the proposal suggests that all capacity categories other than Capacity Performance should be subjected to a restriction on the maximum quantity of the category that can clear in the RPM auctions. To determine the maximum amount of each type that can be procured while being consistent with the reliability requirement, the PJM staff proposal outlines a proposed methodology.

Stakeholder input is sought on the Capacity Performance quantity that achieves a reliable level of service. In general terms, coal and nuclear units meet the reliable performance with reasonable maintenance investment to qualify as base load units. Many gas units in PJM currently have dual fuel capability. Those that do not will need to invest in upgrades or acquire appropriate gas contracts. In aggregate PJM believes the resource targets are reasonably attainable given sufficient lead time and with appropriate level of investment.

Can PJM provide a basis for the amount of Capacity Performance and Base Capacity resources?

Yes, the detailed methodology is being developed and the calculated limits will be provided.

What is the proposed methodology for establishing the maximum value of each category?

The criterion to determine the IRM is still 0.1 occurrences per year. This is based on all capacity being Capacity Performance. The 10 percent tolerance is used to determine the constraints on limited products that can be allowed in the market. This was first addressed in 2013 at the Capacity Senior Task Force when discussing changes made in modeling Limited DR and Extended Summer DR using caps instead of minimum resource requirements.

Since the development of the initial DR Reliability Targets in 2011, PJM has stated to stakeholders and to FERC that it would continue to examine the reliability impacts of these more limited products and that changes to the existing procedures may be necessary. The Capacity Performance Whitepaper, issued August 20, 2014, explains why PJM
believes that changes to the current DR Target calculation procedures are necessary. PJM proposes the Limited and Extended Summer products, and Base Capacity will be capped.

*In the past PJM has indicated that the 95 percent+ of LOLE risk occurs in the summer months. Has that assessment changed?*

PJM believes the winter 2014 events demonstrated an increase in generation forced outage rates related to winter conditions. This indicates that the generation performance assumption in the LOLE risk calculations does not appear to be valid. Therefore, PJM believes an incentive / penalty structure needs to be implemented to address the issue. PJM believes the non-summer risk also increases as summer only resources replace annual resources.

**Unforced Capacity (UCAP) Calculations and Installed Reserve Margin**

The ICAP of a generating unit is the output a unit can dependably achieve during summer conditions. Unforced Capacity (UCAP) is the average available capacity of the unit based on historic forced outages.

In Section IV, the PJM proposal addresses changes in the UCAP rating for both generation and demand resources, as well as implications on the IRM. Through the enhanced definition of capacity which PJM is proposing, the actual resource performance will more closely align with the assumptions of the IRM calculation. In other words, no change to the current IRM calculation would be required.

*Is PJM adjusting the Installed Reserve Margin (IRM), the Loss of Load Expectation (LOLE) or the methodology for calculating?*

Regarding the IRM, PJM does not believe increasing the level is viable or would achieve reliability targets in a reasonable manner and does not anticipate changing the methodology to calculate IRM at this time. Regarding the LOLE, PJM does not anticipate changing the methodology to calculate, however, the caps on non-Capacity Performance products will be determined based on impact on LOLE.

*Is it PJM’s intention to remove Outside Management Control (OMC) outages for EFORd calculations and apply this revised calculation methodology for EFORd to both Capacity Performance products and to Base Capacity products?*

For the calculation of EFORd, PJM proposes to use forced outages with no adjustment for any reason, including OMC. PJM proposes, however, an exemption to the penalty provisions for bulk power transmission system-related outages.

**Capacity Performance Availability and Flexibility Requirements**

A key objective of the Capacity Performance resource is to provide PJM markets and operations the high availability of resources and flexible resource operating parameters. In the Problem Statement, PJM staff identified the issues requiring resolution to ensure PJM capacity resources perform as required in order to efficiently maintain reliability
year round. The PJM Staff Proposal outlines proposed requirements of committed Capacity Performance resources in Section V.

**What is the basis for requiring Capacity Performance resources to be able to run for 16 hours a day for three consecutive days?**

The basis for PJM’s proposal is the typical nature of peak load periods where weather conditions that drive those peak load events can persist for periods of several days.

**Will PJM’s on-site fuel requirements extend to start-up fuel?**

PJM’s fuel security requirements extend to start-up fuel. PJM proposes that units will be able to start at PJM’s direction based on the unit’s physical parameters or be subject to the penalty provisions. PJM notes that under its proposal, units may operate outside of their dispatch instructions from PJM in order ensure that they are able to meet PJM’s dispatch requirements but will not be eligible to be made whole for operation during such periods.

**How will Parameter Limited Schedules (PLS) be incorporated into this proposal?**

PJM proposes that units committed as Capacity Performance will be scheduled and dispatched in the energy market based on their physical parameters and not based on non-physical parameters, such as, fuel contract or availability; economic decisions to reduce staffing levels which impacts start times; etc. One of the proposed stipulations of being in the Capacity Performance category is that the resource must perform according to its physical operating parameters or forego any uplift payments for operating outside of those parameters when not dispatched by PJM, or face a capacity penalty for non-performance. PLS is one approach to reaching this end.

**In the PJM proposal the “Intraday Cycling Asset Class” (i.e., a CT) is the type of asset that has a start-up + Notification time less than or equal to 1 hour. Does PJM expect this asset class to be online irrespective of whether or if a gas nomination was placed?**

The current proposal is that unit scheduling is based on physical parameters not fuel acquisition issues. Therefore PJM proposes that the “intraday cycling asset class” would be expected to be online irrespective of whether a gas nomination was placed. PJM clarifies that the actual dispatch parameters would be established on more specific unit classes; the three more general classes were described in the proposal for the purposes of establishing the eligibility requirements for offering as Capacity Performance.

**The paper notes that many “restrictions on offers” will be eliminated. Please clarify what offers are being referenced here?**

If a resource clears as Capacity Performance it must bid parameters based on the physical capabilities of the unit only. It cannot extend its notification or start up time so that it looks less attractive to be scheduled. It can’t manipulate its min/max or min run time due to contractual issues that are unrelated to the physical capability of the unit itself.
How will PJM address the need for adequate intraday and interday resource flexibility if resource owners elect almost entirely “base” qualification standards during Base Residual Auction (BRA) bidding?

The intent of the Capacity Performance proposal is to provide the ability for resources to offer into the Capacity auctions at levels that will provide the necessary incentives to enhance their units’ capabilities to perform according to the established requirements.

With regard to the requirement that Capacity Performance resources be staffed, is PJM planning to provide more detail on that? For example, is remote start not allowed?

Remote start-up is allowed under the proposal; however, staffing cannot be a consideration for start-up or notification times that exceed the physical capabilities of a unit.

For Base Load Asset class, there is a 6,000 run hour per year criteria. Is the 6,000 hours what it has potential to run at, or what it actually did run at?

The Base Load Asset class run time criteria is what the unit actually ran, not a hypothetical.

The Base Load Asset Class qualification requirements limit inclusion to resources with more than 6,000 run hours per year. This would exclude plants with long lead times that are available and flexible, but are not dispatched simply due to economics. Is it PJM’s intention to exclude these assets from qualification as Capacity Performance products?

PJM is seeking feedback from stakeholders on a definition that identifies, and adequately compensates, flexible resources. The Capacity Performance standard is a level of expectation for the resource to be available when called upon irrespective of previous dispatch history.

Changes to Base Capacity Requirement

In Section VI, the PJM Staff Proposal identifies modifications to the current capacity market rules to ensure that resources meet Base Capacity requirements. In this section, modifications are identified to ensure that annual capacity resources provide flexible operating characteristics. Additionally, this section also identifies modifications to the eligibility requirements of storage resources.

For the Base Capacity product could the resource provide more energy in some hours and less energy in other hours to help PJM meet load-following needs without being penalized, particularly storage devices?

The resource must have the capability to provide the prescribed amount awarded as Base Capacity and follow PJM dispatch in operation.
Peak Period Performance Assurance - Capacity Performance Features

Another key objective of the Capacity Performance product is to create enhanced operational performance of resources during peak periods. In Section VII, the PJM Staff Proposal outlines the proposed penalty structure for the Capacity Performance and Base Capacity resource categories.

Where will the non-performance penalty money that PJM collects be allocated?

PJM proposes the Hourly Energy Penalty will be distributed to Load Serving Entities (LSEs) pro rata based on Locational Reliability Charges.

Can PJM explain which proposed penalties are new, which penalties are proposed to be retained and the timeframe they may go into effect?

Performance penalties for any qualified Capacity Performance resource only apply during called Hot and Cold Weather Alerts and/or Max Emergency Events. PJM proposes to maintain the current penalty structure for Annual DR offered as Base Capacity resource, Extended Summer DR and Limited DR.

For Base Capacity generation resources, PJM proposes to apply the hourly energy penalty for non-delivery, but limited to those periods when PJM has loaded Maximum Generation or any more severe emergency procedure in the summer; resulting in the elimination of the current Peak Hour Availability penalty and associated EFORp calculations. Of course, it is possible for PJM to not schedule a resource entirely, or back down the resource because of transmission constraints, in which case the unit would not be subject to performance penalties under this proposal.

PJM is also proposing to maintain the deficiency penalty for committed units unable to achieve commercial operation by their commitment start date. Should a resource not reach commercial operation in time, the higher of the deficiency or non-performance penalties would apply.

PJM further clarifies that the hourly energy penalty would not apply to intermittent resources (wind and solar) since their capacity value is determined based upon actual output historically achieved during peak periods. Such resources would be eligible to offer only as Base Capacity Resources.

PJM is working to document the details around its proposal for a transition mechanism for the delivery years for which Base Residual Auctions (BRAs) have already been executed.

What obligations will DR or environmentally limited units have should alert hours exceed 876 hours and they are not able to perform? Will they be subject to penalties?

All resources that are committed as Capacity Performance will be subject to penalties for all compliance hours even if compliance hours exceed 876. The 876 hour threshold is an eligibility requirement only; it is not a specification of maximum compliance hours.
Can resource owners offset non-performance across the portfolio?

PJM’s proposal is that trading of Capacity Resources should be allowed such that a short position that would otherwise result in a penalty may be cured via a purchase of an otherwise uncommitted resource. Once Capacity is purchased, it then resides within the purchaser’s portfolio, and therefore offsets are allowed within portfolios and across resource classes. In order to offset penalties that apply to committed resources, the output would need to be from resources that are uncommitted as any product in RPM.

The proposed penalty cap is 2.5 times the annual revenue from capacity. Is that the maximum amount of loss, or is the loss capped at 2.5 times less the 1.0 times of capacity revenue?

PJM proposes to cap the penalty at 2.5 times the annual revenue, such that the maximum net loss would be 1.5 times the annual capacity revenue.

Other than credit requirement changes that will allow PJM to begin billing penalty amounts during the delivery year shortly after non-performance penalties are incurred, what other credit requirements changes does PJM plan to implement to mitigate the default risk of its current or future members?

PJM believes the credit requirements outlined in the proposal accomplish risk mitigation because rather than billing penalties well after the conclusion of a Delivery Year, as is currently done given the timing of the completion of EFORp calculations, PJM would be able to begin billing penalty amounts during the Delivery Year, very shortly after non-performance actually occurred. Therefore, PJM would be able to withhold any remaining RPM revenues, and if necessary other revenues, to offset penalty charges as the Delivery Year progressed.

Product Offer Requirement

There are three main issues with respect to offers into RPM: 1) The ability to reflect all costs associated with improving availability and performance during peak periods; 2) The question of must-offer requirements for the Capacity Performance resource; and 3) The ability to reflect performance risk in capacity offers up to a threshold level so as to make symmetric the risk and reward for making investments to ensure performance while accounting for the fact that outages and non-performance may occur up to a certain level.

In Section VIII of the proposal, proposed changes to offer requirements were outlined to address the issues above.

If a unit has all the characteristics of a Capacity Performance unit, is it required to offer into that category, or can it offer into the safer Base Capacity category?

PJM does not propose to implement a must offer requirement for Capacity Performance resources at this time.

Has PJM considered a formula based risk adder?

Yes. On page 31 of the PJM Capacity Performance Proposal, August 20, 2014, PJM proposes its risk premium adder formula. Regarding risk premiums for Base Capacity resources, PJM would propose that Base Capacity resources
also be allowed to include a risk premium. This would be based on the potential penalty that would apply only during hours when Max Emergency Generation was loaded during the summer period.

**Cost Allocation**

In the current market construct, capacity costs are allocated to Load Serving Entities (LSEs) as Locational Reliability Charges. The LSE Locational Reliability Charge is calculated as the LSE Daily Unforced Capacity Obligation times the Final Zonal Capacity Price. In the PJM Staff Proposal, it was identified that the proposed changes to create a Capacity Performance resource are primarily to assure better availability of capacity in winter. However, the proposal further identifies that the concept of a “critical period” penalty should assure better availability of capacity in summer also. Therefore, the PJM Staff Proposal presents two alternative methodologies for cost allocation for the stakeholders to consider.

*Please provide additional information regarding Fixed Resource Requirement (FRR) entities?*

Similar to the current Limited and Sub-Annual Resource Constraints, the Max Product Caps would apply to FRR load as a percent of FRR peak load. FRR entities would be required to identify in their FRR Capacity Plans which resources are being committed as Capacity Performance and Base Capacity. PJM initially proposes to apply the same penalties to FRR resources as would be applied to RPM resources based on their identification as these Capacity types. PJM seeks feedback as to other penalty mechanisms that might be applied to FRR resources that would be comparable to RPM resources.

**Previously Proposed RPM Changes**

In March 2014, PJM had proposed several other changes to the RPM processes, in particular related to the RPM Incremental Auctions. PJM believes that enhancing the definition of the PJM capacity product as detailed in PJM Staff Proposal will achieve the objectives of some of those previously proposed changes. PJM further believes that the remainder of those changes should be postponed until the instant proposal is implemented to evaluate its effects.

No stakeholder questions on this section were submitted to date.

**Transition Auction Mechanism for Delivery Years 2015/16, 2016/17, 2017/18**

Based on PJM's proposal, in order to meet anticipated peak load requirement challenges, the Capacity Performance resource would be transitioned into RPM beginning with the 2015/16 Delivery Year; continuing in transition during Delivery Years 2016/17 and 2017/18. The 2018/19 BRA – the primary auction that procures the bulk amount of capacity for a given Delivery Year – would be the first BRA to include the Capacity Performance resource. The 2018/19 BRA is held in May 2015.
**Will all cleared and uncleared resources be eligible to participate in the transition mechanism and how would compensation be reflected?**

All cleared and uncleared resources will be eligible to participate in the transition mechanism. Compensation for capacity performance is the auction clearing price times the quantity cleared. In the current proposal PJM does not anticipate an additional payment beyond the Capacity Performance clearing price. Previously uncleared resources will submit offers into the transition auction which presumably will include all costs of providing capacity consistent with performance definitions. For resources that do not offer into the transition auction, PJM does not propose to change previous auction commitments.

**What happens if, during the transition, the special auction does not procure the required amount of Capacity Performance MW?**

The Variable Resource Requirement (VRR) curve would set the clearing price and quantity. The maximum percentage of each product required for each transition auction will be provided by PJM once the final proposal is released. It is believed some phase-in mechanism will be required.

**How will the transition mechanism work for resources that have already cleared in the BRA?**

PJM has proposed a transition auction mechanism, specifics will be available as part of PJM’s final proposal. PJM invites comments on the design of the transition auction mechanism.