2014/2015 RPM Base Residual Auction Planning Period Parameters

Introduction

The RPM Base Residual Auction (BRA) for the 2014/2015 Delivery Year is scheduled to be conducted in May of 2011. This document describes the 2014/2015 BRA planning period parameters and also provides a comparison of the 2014/2015 BRA planning parameters to those used in the 2013/2014 BRA. The detailed planning parameters spreadsheet is posted on the PJM RPM website under 2014/2015 Delivery Year information.

Reserve Requirement Parameters

The Installed Reserve Margin (IRM) and Forecast Pool Requirement (FPR) represent the level of capacity reserves needed to satisfy the PJM reliability criterion of a Loss of Load Expectation (LOLE) not exceeding one occurrence in ten years. The IRM and FPR represent the same level of required reserves but are expressed in different terms of capacity value. The IRM expresses the required installed capacity reserve as a percent of the forecast peak load, whereas the FPR when multiplied by forecast peak load provides the total unforced capacity required. The FPR is equal to (1 + IRM) times (1-Pool-wide Average EFORd).

The reserve requirement parameters to be used in the 2014/2015 BRA are shown in Table 1. For comparison purposes, the values of these parameters used in the 2013/2014 BRA are also shown in Table 1.

Table 1 – Reserve Requirement Parameters for 2013/2014 and 2014/2015 BRAs

Reserve Requirement Parameters	2013/2014 BRA	2014/2015 BRA	Delta
Installed Reserve Margin (IRM)	15.30%	15.30%	0.00%
Pool Wide 5-Year Average EFORd	6.30%	6.25%	-0.05%
Forecast Pool Requirement (FPR)	1.0804	1.0809	0.0005

PJM RTO Region Reliability Requirement

In the RPM clearing process, the PJM RTO Reliability Requirement is used to establish the target reserve level to be procured in an RPM BRA. The PJM RTO Region Reliability Requirement, valued in terms of unforced capacity (UCAP), is the RTO Peak Load Forecast, multiplied by the FPR, less the sum of the Unforced Capacity Obligations of any Fixed Resource Requirement (FRR) Entities in the PJM Region.

The PJM RTO Region Reliability Requirement and the parameters used to derive the requirement for the 2014/2015 BRA are shown in Table 2. For comparison purposes, the values of these parameters used in the 2013/2014 BRA are also shown in Table 2. As

explained below, the 2014/2015 BRA values of Table 2 will be updated after the FRR election deadline of March 2, 2011 to reflect the unforced capacity obligation of load using the FRR alternative.

Table 2 – PJM RTO Reliability Requirement for 2013/2014 and 2014/2015 BRAs

PJM RTO Reliability Requirement Parameters	2013/2014 BRA	2014/2015 BRA	Delta
Preliminary Forecast Peak Load (MW)	160,685.0	164,757.6	4,072.6
Reliability Requirement (UCAP MW)	173,604.1	178,086.5	4,482.4
Preliminary FRR Obligation (UCAP MW)	23,563.2	23,750.4	187.2
PJM RTO Reliability Requirement (UCAP MW)	**150,040.9**	**154,336.1**	**4,295.2**

The preliminary forecast peak load for the PJM RTO for the 2014/2015 Delivery Year is 164,757.6 MW including a peak load contribution of 5,811.6 MW for the DEOK Zone. The DEOK zone was not included in the 2013/2014 BRA. The reliability requirement for 2014/2015 prior to adjustment for FRR obligation is the forecast peak load multiplied by the FPR or 178,086.5 MW. The FRR alternative provides an LSE with the option to submit a FRR Capacity Plan to meet a fixed capacity resource requirement and avoid direct participation in RPM; therefore, the unforced capacity obligation of FRR entities is not included in the PJM RTO Reliability Requirement used in RPM auctions. The PJM RTO Reliability Requirement for 2014/2015 is 154,336.1 MW under the assumption that the same load that elected the FRR Alternative prior to the BRA for the 2013/2014 Delivery Year does so again for the 2014/2015 Delivery Year. The PJM RTO Reliability requirement will be updated after the March 2, 2011 FRR election deadline if the actual amount of load electing the FRR Alternative for the 2014/2015 delivery year deadline differs from that electing the FRR Alternative for the 2013/2014 Delivery Year.

Locational Deliverability Areas

The process of determining the IRM needed to meet the PJM reliability criterion assumes that internal RTO transmission is adequate and that the aggregate of all capacity resources can be delivered to the aggregate of all RTO load without transmission constraints. However, the PJM planning process divides the RTO into different sub-regions called Locational Deliverability Areas (LDAs) to recognize the reality that transmission system limitations restrict the deliverability of capacity resources into these sub-regions. In RPM, a Reliability Requirement and a Variable Resource Requirement (VRR) Curve are established for each LDA that is modeled in the BRA.

Prior to each BRA, the import capability requirement called Capacity Emergency Transfer Objective (CETO) and the import capability limit called Capacity Emergency Transfer Limit (CETL) are calculated for each potential LDA. An LDA with a CETL less

than 1.15 times its CETO is modeled as an LDA in the upcoming BRA. In addition, an LDA is modeled in the upcoming BRA if the LDA had a Locational Price Adder in any one or more of the three immediately preceding BRAs. The MAAC, EMAAC and SWMAAC LDAs are modeled in a BRA regardless of the outcome of the CETL/CETO test or prior BRA results. An LDA not otherwise qualifying under the above three tests may also be modeled if PJM finds that such is required to achieve an acceptable level of reliability consistent with the Reliability Principles and Standards.

Table 3 shows the CETO and CETL values of each LDA to be modeled in the 2014/2015 BRA. For comparison purposes, the CETO and CETL values used in the 2013/2014 BRA for these same LDAs are also shown in Table 3. In addition to the MAAC, EMAAC and SWMAAC LDAs, the PS, PSNORTH, DPLSOUTH and PEPCO LDAs will be modeled in the 2014/2015 BRA. The PSNORTH LDA will be modeled since its CETL to CETO ratio is less than 1.15 and it also experienced a Locational Price Adder as recently as the 2012/2013 BRA. Although their CETL to CETO ratio exceeds 1.15, the DPLSOUTH LDA will be modeled because it had a Locational Price Adder in the 2012/2013 BRA and the PEPCO LDA will be modeled because it had a Locational Price Adder in the 2013/2014 BRA. Although the CETL to CETO ratio of the PS LDA exceeds 1.15 and the LDA has not experienced a Locational Price Adder in any of the last three BRAs, the LDA will be modeled in the upcoming BRA because PJM believes it is prudent from a reliability perspective to do so because the CETL to CETO ratio of 1.17 for 2014/2015 is only slightly greater than the 1.15 threshold and even relatively small future changes in key parameters such as forecasted load, internal capacity level and availability of internal capacity could cause this ratio to drop to more historical levels (the CETL to CETO ratio for the PS LDA for the 2013/2014 and 2012/2013 Delivery Years was .99 and 1.01, respectively).

Table 3 – CETO and CETL Values for LDAs to be Modeled in the 2014/2015 BRA

	2013/2014 BRA			2014/2015 BRA			Delta	
LDA	CETO (UCAP MW)	CETL (UCAP MW)	CETL/CETO Ratio	CETO (UCAP MW)	CETL (UCAP MW)	CETL/CETO Ratio	CETO (UCAP MW)	CETL (UCAP MW)
MAAC	4,190	4,460	1.06	2,020	5,694	2.82	-2,170	1,234
EMAAC	7,050	7,095	1.01	5,790	8,189	1.41	-1,260	1,094
SWMAAC	5,740	6,725	1.17	5,420	7,719	1.42	-320	994
PS	5,950	5,868	0.99	4,880	5,721	1.17	-1,070	-147
PSNORTH	2,620	2,570	0.98	2,110	2,372	1.12	-510	-198
DPLSOUTH	1,350	2,123	1.57	1,410	1,925	1.37	60	-198
PEPCO	4,030	4,483	1.11	3,500	5,606	1.60	-530	1,123

The CETO value for each LDA is determined using a probabilistic model of the load and capacity located within the LDA. The model recognizes, among other factors, historical load variability, load forecast error, generating unit maintenance requirements and forced outage rates of generating units. The main factors driving changes in an LDA's CETO value are changes in the peak load of the LDA, changes in the level of capacity resources (including generation, demand response and energy efficiency) located within the LDA and changes in the availability factor of capacity resources located within the LDA. The CETO of an LDA will increase for increases in LDA peak load, decreases in the level of capacity resources located within the zone and decreases in the availability factor of capacity resources located within the LDA. Conversely, the CETO of an LDA will decrease for decreases in LDA peak load, increases in the level of capacity resources located within the LDA and increases in the availability factor of capacity resources located within the LDA.

As shown in Table 3, 2014/2015 CETO values are lower than 2013/2014 CETO values for all LDAs except for the DPLSOUTH LDA for which the CETO value stayed nearly flat. The decrease in LDA CETO values as compared to the 2013/2014 values is primarily due to a decrease in forecasted LDA peak loads and an increase in the level of DR and EE resources located in each of the LDAs. A decrease in average EFORd of internal generation capacity resources also contributed significantly to the decrease in CETO values for the SWMAAC and the PEPCO LDAs.

The CETL of an LDA is impacted by changes in transmission system topology including the addition or removal of transmission facilities and changes in the load distribution profile within a zone or region. The CETL of an LDA may also be impacted by the addition or retirement of generation facilities.

As shown in Table 3, 2014/2015 CETL values are significantly higher than 2013/2014 CETL values for the MAAC, SWMAAC and PEPCO LDAs. The increase in CETL for these LDAs is mainly attributable to the addition of the Brambleton 500 kV substation and Brambleton 500/230 kV transformer. The Brambleton 500/230 kV transformer is located in the Dominion zone between the Pleasant View and Loudoun 500 kV substations and is expected to be placed in service by 6/1/2014. The addition of this transformer significantly off-loads the Pleasant View 500/230 kV transformer which was the transmission facility that limited transfer capability into these LDAs in the previous year's model. The off-loading of the Pleasant View 500/230 kV transformer by the addition of the Brambleton 500/230 kV transformer allowed for higher transfer capability levels into these LDAs in the 2014/2015 model.

The increase in CETL for the EMAAC LDA is attributable mainly to two factors, each of which has the effect of off-loading the Elroy-Branchburg 500 kV line. The Elroy-Branchburg 500 kV line was the transmission facility that limited transfer capability into the EMAAC LDA in the 2013/2014 model and off-loading this line allowed for a higher transfer capability level into the EMAAC LDA in the 2014/2015 model. These two factors include (1) a 350 MW reduction in the size of the O66 project and (2) a shift in the load distribution profile of the EMAAC LDA. The O66 project is a merchant transmission project located in northern New Jersey and a reduction in the size of this project reduced the loading of the Elroy-Branchburg 500 kV line which feeds into this portion of the EMAAC LDA. As compared to last year's model, the load distribution profile of the EMAAC LDA has shifted such that EMAAC zones located in the receiving-end area of the Elroy-Branchburg 500 kV line have a slightly lower share of the total EMAAC LDA load than EMAAC zones located in the sending-end area of the Elroy-Branchburg 500 kV line reducing the loading of the Elroy-Branchburg 500 kV line. The net effect of the reduction in the size of the O66 project and the EMAAC load distribution profile change is a reduction in the loading of the Elroy – Branchburg 500 kV line and, consequently, an increase in the EMAAC LDA CETL.

LDA Reliability Requirements

In RPM, a Reliability Requirement is established for each LDA modeled in the BRA. Table 4 shows the reliability requirement for each LDA modeled in the 2014/2015 BRA. For comparison purposes, the reliability requirements used in the 2013/2014 BRA for these same LDAs are also shown in Table 4. The changes in LDA reliability requirements are primarily driven by the change in LDA peak load.

Table 4 – Reliability Requirement for LDAs Modeled in 2014/2015 BRA

LDA	2013/2014 BRA (UCAP MW)	2014/2015 BRA (UCAP MW)	DELTA (UCAP MW)	DELTA (%)
MAAC	73,142	72,187	-955	-1.3%
EMAAC	40,398	39,995	-403	-1.0%
SWMAAC	17,899	17,358	-541	-3.0%
PS	13,401	13,099	-302	-2.3%
PSNORTH	6,347	6,211	-136	-2.1%
DPLSOUTH	2,996	3,018	22	0.7%
PEPCO	9,442	8,951	-491	-5.2%

Variable Resource Requirement Curve

A Variable Resource Requirement (VRR) curve is established for the RTO and for each constrained LDA modeled in the BRA. The VRR curve is a demand curve used in the clearing of the BRA that defines the price for a given level of capacity resource commitment relative to the applicable reliability requirement. The VRR curves for the PJM Region and each LDA are based on the following parameters:

- A target level of reserve
- Net Cost of New Entry (CONE)

Target Level of Reserves

The target level of reserves for the PJM RTO Region is the PJM RTO Region Reliability Requirement less the Short Term Resource Procurement Target (STRPT) where the STRPT is equal to 2.5% of the PJM RTO Region Reliability Requirement. The target level of reserves for each LDA is the LDA Reliability Requirement less the STRPT allocated to the LDA where the PJM RTO STRPT is allocated to zones based on the ratio of forecast zonal peak load to forecast PJM RTO peak load adjusted for any FRR load.

Net Cost of New Entry (CONE)

Table 5 shows the CONE values for the PJM RTO and each LDA to be modeled in the 2014/2015 BRA. For comparison purposes, the CONE values used in the 2013/2014 BRA are also shown in Table 5. The gross CONE for each LDA is updated each year by multiplying the values used in the previous year's BRA by the latest one-year change in the applicable Handy-Whitman Index. Using this approach, gross CONE values are 4.9% higher than the gross values used in last year's BRA. The Net CONE is determined for the RTO and for each modeled LDA by subtracting the Energy & Ancillary Services (E&AS) offset revenue from the gross CONE. The E&AS revenue offset is the annual average of the revenues that would have been received by the reference combustion turbineover a period of the three most recent calendar years. The Net CONE (in ICAP terms) is divided by [(1 - Pool-wide Average EFORd) multiplied by the number of days in a year] to develop the Net CONE value in $/MW-Day in UCAP terms. The Net CONE (in UCAP terms) is used in the development of the RTO VRR Curve and the VRR Curve for each modeled LDA.

Table 5 shows that Net CONE values for the 2014/2015 BRA are higher than values used in last year's BRA by 5.3% to 7.6%. This increase is due to a 4.9% increase in gross CONE values coupled with a slight increase in the E&AS offset for the LDAs.

Table 5 – Net CONE for PJM RTO and LDAs

	2013/2014 BRA				2014/2015 BRA				DELTA	
	CONE ICAP Terms ($/MW-Year)	E&AS Offset ICAP Terms ($/MW-Year)	Net CONE ICAP Terms ($/MW-Year)	Net CONE UCAP Terms ($/MW-Day)	CONE ICAP Terms ($/MW-Year)	E&AS Offset ICAP Terms ($/MW-Year)	Net CONE ICAP Terms ($/MW-Year)	Net CONE UCAP Terms ($/MW-Day)	Net CONE UCAP Terms ($/MW-Day)	Net CONE UCAP Terms (%)
RTO	122,236	13,495	108,741	317.95	128,226	11,119	117,107	342.23	24.28	7.6%
MAAC	122,236	44,531	77,705	227.20	128,226	45,446	82,780	241.91	14.71	6.5%
EMAAC	132,169	42,885	89,284	261.06	138,646	44,538	94,108	275.02	13.96	5.3%
SWMAAC	122,236	44,531	77,705	227.20	128,226	45,446	82,780	241.91	14.71	6.5%
PS	132,169	42,885	89,284	261.06	138,646	44,538	94,108	275.02	13.96	5.3%
PS NORTH	132,169	42,885	89,284	261.06	138,646	44,538	94,108	275.02	13.96	5.3%
DPL SOUTH	132,169	42,885	89,284	261.06	138,646	44,538	94,108	275.02	13.96	5.3%
PEPCO	122,236	44,531	77,705	227.20	128,226	45,446	82,780	241.91	14.71	6.5%

Minimum Resource Requirements

Two additional demand resource products have been established starting with the 2014/2015 Delivery Year. The Annual Demand Resource product is one that is available throughout the year and the Extended Summer Demand Resource product is one that is available with an expanded summer commitment period. These new products have fewer limitations than the current Limited Demand Resource product. Prior to each auction, PJM determines the maximum reliable contribution of the more limited demand resources to the PJM region and the MAAC, EMAAC and SWMAAC LDAs. The maximum contribution levels are implemented and enforced in each RPM auction as a minimum requirement on the commitment of less limited products.

The Extended Summer Demand Resource Reliability Target is the maximum amount of Extended Summer Demand Resources that can reliability be procured in an auction assuming PJM procures resources in the auction equal to the level of the Reliability Requirement. The target is expressed as a percentage of forecast peak load and converted to UCAP MW so that it can be deducted from the Reliability Requirement to determine the Minimum Annual Resource Requirement. The Minimum Annual Resource Requirement is the minimum amount of capacity sought to be procured from Annual Resources. Annual Resources include generation capacity resources, energy efficiency resources and annual demand resources. A Minimum Annual Resource Requirement is established for the RTO and the MAAC, EMAAC and SWMAAC LDAs.

The Limited Demand Resource Reliability Target is the maximum amount of Limited Demand Resources that can reliability be procured in an auction assuming PJM procures resources in the auction equal to the level of the Reliability Requirement. The target is expressed as a percentage of forecast peak load and converted to UCAP MW so that it can be deducted from the Reliability Requirement to determine the Minimum Extended Summer Resource Requirement. The Minimum Extended Summer Resource Requirement is the minimum amount of capacity sought to be procured from Extended Summer Demand Resources and Annual Resources. A Minimum Extended Summer Resource Requirement is established for the RTO and the MAAC, EMAAC and SWMAAC LDAs.

Table 6 shows the target reserve level (reliability requirement minus the short-term resource procurement target), the minimum annual resource requirement and the minimum extended summer resource requirement for the RTO and the MAAC, EMAAC and SWMAAC LDAs. As per the 1/31/2011 FERC Order (ER11-2288-000), FERC has ordered PJM to file Tariff revisions in a 30-day compliance filing to apply minimum resource requirements to all of the LDAs in PJM or explain why such an application is not necessary. The table below will be revised consistent with the specifics of the 30-day compliance filing.

Table 6 – Target Reserve Levels and Minimum Resource Requirements in UCAP MW for 2014/2015 BRA

	RTO	MAAC	EMAAC	SWMAAC
Target Reserve Level	150,478	70,520	39,085	16,969
Minimum Extended Summer Resource Requirement	143,543	61,319	28,773	8,387
Minimum Annual Resource Requirement	133,658	57,749	25,397	7,003

Summary

- The preliminary forecast peak load for the PJM RTO for the 2014/2015 Delivery Year is 164,757.6 MW including a peak load contribution of 5,811.6 MW for the DEOK Zone.

- Primarily due to a lower load forecast, LDA reliability requirements for the 2014/2015 BRA are lower than LDA reliability requirements for the 2013/2014 BRA.

- The 2014/2015 CETLs for the MAAC, SWMAAC and PEPCO LDAs are significantly higher than the 2013/2014 CETLs due to the addition of the Brambleton 500/230 kV transformer which is expected to be in-service by June 1, 2014. The addition of this transformer significantly off-loads the Pleasant View 500/230 kV transformer which was the transmission facility that limited transfer capability into these LDAs in the 2013/2014 model. The SWMAAC LDA CETL was also positively impacted by the addition of a second Conastone-Graceton 230 kV circuit which is expected to be place in service by June 1,2014.

- The 2014/2015 CETL for EMAAC is significantly higher than the 2013/2014 CETL primarily due to two factors: (1) a reduction in the size of the O66 project, a merchant transmission project located in northern New Jersey and (2) a change in the load distribution profile of the EMAAC LDA. Each of these factors has the effect of off-loading the Elroy-Branchburg 500 kV line which was the transmission facility that limited transfer capability into the EMAAC LDA in the 2013/2014 model.

- Effective for the 2014/2015 Delivery Year, Minimum Annual Resource Requirements and Minimum Extended Summer Resource Requirements are established for the RTO and the MAAC, EMAAC and SWMAAC LDAs. The Minimum Annual Resource Requirement is the minimum amount of capacity sought to be procured from Annual Resources. Annual Resources include generation capacity resources, energy efficiency resources and annual demand resources. The Minimum Extended

Summer Resource Requirement is the minimum amount of capacity sought to be procured from Annual Resources and Summer Extended Demand Resources.

- The cost of new entry values that serve as the basis for price on the RTO and LDA demand curves increased by 7.6% (for the RTO) and by 5.3% to 6.5% (depending on LDA) over the 2013/2014 values due to a 4.9% increase in gross CONE coupled with a slight increase in E&AS revenue offsets.