



Market Monitoring Unit

# **Analysis of the Three Pivotal Supplier Test: March 1 through December 31, 2006**

PJM Market Monitoring Unit

May 7, 2007

## Summary

The Market Monitoring Unit (MMU) submits this report in compliance with its obligation to evaluate on a quarterly basis whether any changes in status are appropriate for the exempt and non-exempt interfaces in PJM.

The PJM Operating Agreement (OA) (Schedule 1, Section 6.4.1(d)(i)) states that “offer price caps shall not be applicable to generation resources used to relieve the Western, Central and Eastern reactive limits in the MAAC Control Zone and APS South Interface,” subject to the additional OA provision (Schedule 1, Section 6.4.1(d)(ii)) that “on a quarterly basis, using an analysis no less stringent than the test for suspending offer capping set forth in sections 6.4.1(e) and (f) below, the PJM Market Monitoring Unit will evaluate whether additional interfaces also should be exempt and whether any existing exemptions should be terminated.”

These four identified interfaces, the Western, Central, Eastern and AP South Interfaces are thus currently exempt from offer capping and are referred to in this report as the exempt interfaces. These four interfaces are the only exempt interfaces. Interfaces are one type of potential transmission constraints and these four interfaces are the only exempt constraints.

The test for suspending offer capping set forth in the OA Schedule 1, Sections 6.4.1(e) and (f) is the three pivotal supplier test. The three pivotal supplier test is applied by PJM on an ongoing basis in both the day-ahead and real-time energy markets in order to determine whether offer capping is required for any constraints not exempt from offer capping and for any units not exempt from offer capping.<sup>1</sup> The three pivotal supplier test is applied in real time in both the day-ahead and real-time markets. In the day-ahead market, PJM market operators apply the test as they clear the market. In the real-time market, PJM market operators also apply the test as they clear the market.

The MMU analyzed the results of the three pivotal supplier tests conducted by PJM for the real-time energy market during the period March 1, 2006, through December 31, 2006. In this report, for a comprehensive view of the results, the MMU presents the results for the first ten months during which the three pivotal supplier test was applied.<sup>2</sup> A summary of the results of PJM’s application of the three pivotal supplier test is presented for all constraints, including interfaces currently exempt from the application of the offer mitigation rules and interfaces currently subject to the application of the offer mitigation rules.

The MMU could not analyze the results of the three pivotal supplier test for exempt interfaces in the day-ahead market because, in contrast to PJM’s approach in the real-time market, PJM does not consistently apply the three pivotal supplier test to these

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<sup>1</sup> For additional information on the three pivotal supplier test, see *2006 State of the Market Report*, Volume II, pp. 40 – 55 and Appendix J, “Three Pivotal Supplier Test.”

<sup>2</sup> The three pivotal supplier test was implemented effective March 1, 2006. This report covers the ten month period through December 31, 2006. Subsequent reports will cover calendar quarters.

constraints in the day-ahead market and the results are not saved. As a result, it is not possible for the MMU to analyze the market structure associated with exempt interfaces in the day-ahead market in the same way as the MMU analyzes the market structure associated with exempt interfaces in the real-time market. As an illustration of the importance of extending the analysis to the day-ahead market, the currently exempt interfaces accounted for \$160 million in day-ahead congestion costs in 2006 and \$6 million in balancing congestion costs. In addition, the exempt interfaces were constrained for more hours in the day-ahead market than in the real-time market. During 2006, the exempt interfaces were constrained 2,643 hours in the day-ahead market and 591 hours in the real-time market.<sup>3</sup>

As a result of PJM's implementation of the three pivotal supplier test, decisions about offer capping are based on real-time analysis of the actual competitive conditions associated with each binding constraint as they occur in both the day-ahead and real-time energy markets. The three pivotal supplier test replaced the prior approach which was to offer cap all units required to resolve a binding constraint.

## Recommendations

As a result of the fact that the three pivotal supplier test ensures that offer capping will be applied only when required by market conditions, the MMU recommends that no interfaces or constraints be granted a blanket exemption. The MMU recommends that offer capping be based on the application of the three pivotal supplier test to actual market structures for all constraints in both the day-ahead and real-time energy markets, including those interfaces now exempt from offer capping.

The MMU recommends that three pivotal supplier testing be immediately and consistently applied to all constraints in the clearing of the day-ahead energy market and the results saved, so that the results of the day-ahead market can be replicated and analysis of the day-ahead market results can be performed.

The MMU recommends that PJM cooperate with the MMU to facilitate a complete and thorough review by the MMU of the actual implementation of the three pivotal supplier test in both the day-ahead and real-time markets including a detailed review and testing of the relevant software and operating procedures. Such a review has not been done and such a review is critical to ensure that the test is being properly applied.

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<sup>3</sup> See *2006 State of the Market Report*, Volume II, p. 43.

## Background

By order issued April 18, 2005, the United States Federal Energy Regulatory Commission (the Commission or the FERC) set for hearing, in Docket No. EL04-121-000, PJM's proposal (a) to exempt the AP South Interface from PJM's offer-capping rules and (b) to conduct annual competitive analyses to determine whether additional exemptions from offer capping are warranted.

By order issued July 5, 2005, the Commission also set for hearing, in Docket No. EL03-236-006, PJM's three pivotal supplier test used to determine whether suppliers have market power when units must be called out of merit order in order to resolve transmission constraints. The Commission further set for hearing issues related to the appropriateness of implementing scarcity pricing in PJM. In the July order, the Commission consolidated Docket No. EL04-121-000 and Docket No. EL03-236-006.

On November 16, 2005, PJM filed a settlement agreement resolving all issues set for hearing in these two proceedings. On December 20, 2005, the presiding administrative law judge certified the settlement agreement to the Commission as uncontested. On January 27, 2006, in Docket Nos. EL03-236-006, EL04-121-000, 001 and 002 the Commission ordered that the settlement agreement, including the amendments to the PJM Tariff and Operating Agreement, was in the public interest and was thereby approved and accepted for filing and made effective as set forth in the settlement agreement.<sup>4</sup>

## Prior Analyses

The Commission conferred blanket exemptions from offer capping for local market power on four of the largest interfaces in PJM, prior to the development and implementation of the three pivotal supplier test. The current exemption of the Western, Central and Eastern Interfaces (reactive limits) in the MAAC Control Zone is based on a study completed in 1997 and submitted as part of PJM's initial application to the Commission.<sup>5</sup> That study examined Herfindahl-Hirschman Index (HHI) statistics for a then recent historical period and determined that concentration was generally not high enough to be a concern for these interfaces. The study did not examine the markets defined by the demand for effective MW to resolve the identified interface constraints and associated incremental MW of effective supply available to meet that demand, but analyzed the total capacity in the areas created by the interfaces, taking account of estimated costs as well as a market definition for total capacity consistent with the delivered price test approach. As a result of data limitations, that study did not account for distribution factor impacts on effective supply or the effective cost of that supply. That study also concluded that local market power was a concern for the local markets created by other transmission constraints.

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<sup>4</sup> 114 FERC ¶ 61,076.

<sup>5</sup> *PJM Supporting Companies*, Transmittal Letter, Docket No. ER97-3729-000 (July 14, 1997).

The current exemption of the AP South Interface is based on an October 2004 report of the PJM market monitor. On October 26, 2004, PJM submitted a “Report of the PJM Market Monitor Regarding Offer Capping of Major Transmission Constraints” in which the PJM market monitor concludes that the continued exemption of the Western, Central and Eastern Interfaces was supported by competitive analysis as was exemption of the AP South Interface.<sup>6</sup> In the October 2004 report, a delivered price test was performed based on supply curves simulated using GE MAPS and representative loads for each constraint analyzed. The supply curve was divided into four quartiles, representing relatively competitive resources within each quartile of the supply curve, for each system load condition. Load duration analysis was used to divide load levels into four quartiles for each constraint where the difference among the four quartiles was the system load and the corresponding system price. The demand for MW levels of control actions was determined by reviewing a range of actual system conditions and selecting a representative high requirement for control actions taken by PJM where these data were available from PJM and using estimates where the data were not available. Within the markets defined in this manner, a pivotal supplier analysis was performed to determine the extent to which one or more suppliers were individually or jointly pivotal in the market to provide required control for the identified major transmission constraints.<sup>7</sup>

The conclusions of the October report differ from the recommendations in this report for a number of reasons, primarily that offer capping is now applied in real time based on the results of the three pivotal supplier test that takes account of actual, real-time system conditions including generator availability and transmission system conditions. Given this real-time application of a test for competition, there is no longer a need to make a general determination about the competitiveness of any constraint, including the currently exempt interfaces.

The 1997 decision to exempt the Western, Central and Eastern Interfaces and the 2004 recommendation to exempt the AP South Interface made sense at the time based on analytical limitations and based on the associated broad brush application of offer capping to all units required to operate to control a constraint. These decisions made sense at the time given that the local markets created by the interfaces were generally structurally competitive based on the analysis at the time, and given that offer capping could not be limited to periods when the local markets were not structurally competitive or to the specific owners who had structural market power and who would otherwise exercise market power.

The three pivotal supplier test defined in the OA represents a significant evolution in accuracy over both the 1997 analysis and the 2004 analysis because the three pivotal supplier test uses real-time data and tests constraints as they actually arise with all the actual system features that exist at the time including transmission constraints, load and generator availability.

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<sup>6</sup> See “Report of the PJM Market Monitor” filed October 26, 2004, in Docket Nos. ER04-539-001, 002, EL04-121-000 at P 27.

<sup>7</sup> *Id* at P 16.

## **Three Pivotal Supplier Results for All Constraints: Real-Time Energy Market**

The analysis here relies on the output from the application of the three pivotal supplier test in the real-time energy market by PJM. The MMU does not apply the three pivotal supplier test in the execution of either the day-ahead or real-time energy markets. The three pivotal supplier test utilizes software systems developed, operated and maintained solely by PJM. The MMU does not determine any components of the three pivotal supplier test calculation, but relies entirely on the test inputs and results as determined by PJM's market software. The analysis here reflects the actual test outcomes as determined by PJM and utilized in the conduct of the real-time energy market. PJM may apply the three pivotal supplier test for a constraint as frequently as every five minutes or less frequently, depending on actual system conditions. The results reported here reflect the actual frequency with which the test is applied by PJM.

### ***Peak Hours***

There were a total of 55,903 three pivotal supplier tests applied across 405 constraints during peak hours for the period March 1, 2006, through December 31, 2006.<sup>8</sup> Of the 405 constraints tested during peak hours, all but one demonstrated market structures which resulted in one or more owners failing the three pivotal supplier test for at least one tested interval. Of the 55,903 tests conducted during peak hours, 54,524 were applied to non-exempt constraints.<sup>9</sup> Of these 54,524 peak hour tests, 7,557, or 14 percent, resulted in one or more suppliers passing the three pivotal supplier test. Under PJM's prior offer mitigation rules, all suppliers would have been subject to offer capping. A summary of these results is presented in Table 1.

### ***Off-Peak Hours***

There were a total of 39,376 tests applied across 243 different constraints during off-peak hours for the period March 1, 2006, through December 31, 2006. Of the 243 constraints tested during off-peak hours, all but five demonstrated market structures which resulted in one or more owners failing the three pivotal supplier test for at least one tested interval. Of the 39,376 tests conducted during off-peak hours, 38,620 were applied to non-exempt constraints. Of these 38,620 off-peak hour tests, 11,323, or 29 percent, resulted in one or more suppliers passing the three pivotal supplier test. Under PJM's prior offer mitigation rules, all suppliers would have been subject to offer capping. A summary of these results is presented in Table 1.

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<sup>8</sup> Peak hours are defined as weekdays between hours ending 0800 and 2300, excluding NERC holidays.

<sup>9</sup> Offer price caps currently are not applicable to generation resources used to relieve the Western, Central and Eastern reactive limits in the MAAC Control Zone and AP South Interface.

**Table 1 PJM Application of Three Pivotal Supplier Test to All Constraints**

	Peak hours	Off-peak hours
<b>Total tests applied</b>		
All constraints	55,903	39,376
Non-exempt constraints	54,524	38,620
Exempt Constraints	1,379	756
<b>Tests resulting in one or more passing owners</b>		
All constraints	8,755	11,990
Non-exempt constraints	7,557	11,323
Exempt Constraints	1,198	667
<b>Percent of tests resulting in one or more passing owners</b>		
All constraints	16%	30%
Non-exempt constraints	14%	29%
Exempt Constraints	87%	88%

## Three Pivotal Supplier Results for Interfaces

Offer caps currently do not apply to generation resources used to relieve the Western, Central and Eastern reactive limits in the MAAC Control Zone or the AP South Interface. Nonetheless, during the period March 1, 2006, through December 31, 2006, three pivotal supplier test results for the real-time energy market were calculated by PJM for all four currently exempt interfaces. This section compares the results of the application of the three pivotal supplier test to exempt and non-exempt interfaces in the real-time energy market.

### *Interface Testing Results: Peak Hours*

#### **Exempt Interfaces**

There were a total of 1,379 three pivotal supplier tests applied in the real-time energy market to the exempt interfaces during peak hours for the period March 1, 2006, through December 31, 2006. Of the 1,379 three pivotal supplier tests applied to exempt interfaces during peak hours, 269, or 20 percent of those, resulted in one or more suppliers failing the three pivotal supplier test. Under PJM's current offer mitigation rules, these suppliers were not subject to offer capping. A summary of the exempt interface results is presented in Table 2. A breakdown of the results for exempt interfaces is presented in Table 3. Table 3 shows that 491, or 36 percent, of the tests applied to exempt interfaces during on-peak periods were applied to the AP South Interface with the remainder applied to the other three exempt interfaces. Table 3 also shows that 229, or 85 percent, of the three pivotal supplier tests during on-peak periods with one or more failing owners were for the AP South Interface, again with the remainder for the other three exempt interfaces.

## Non-Exempt Interfaces

There were a total of 3,898 tests applied in the real-time energy market to non-exempt interfaces during peak hours for the period March 1, 2006, through December 31, 2006.<sup>10</sup> Of the 3,898 three pivotal supplier tests applied to non-exempt interfaces during peak hours, 1,532, or 39 percent of those, resulted in one or more suppliers failing the three pivotal supplier test. Under PJM's current offer mitigation rules, these suppliers were subject to offer capping. A summary of these results is presented in Table 2.

**Table 2 PJM Application of Three Pivotal Supplier Test to Non-Exempt and Exempt Interfaces**

	Peak hours	Off-peak hours
Total tests applied		
Non-exempt interfaces	3,898	5,241
Exempt interfaces	1,379	756
Tests resulting in one or more failed owners		
Non-exempt interfaces	1,532	2,584
Exempt interfaces	269	146
Percent of tests resulting in one or more failed owners		
Non-exempt interfaces	39%	49%
Exempt interfaces	20%	19%

## Interface Testing Results: Off-Peak Hours

### Exempt Interfaces

There were a total of 756 tests applied in the real-time energy market to exempt interfaces during off-peak hours for the period March 1, 2006, through December 31, 2006. Of the 756 three pivotal supplier tests applied to exempt interfaces during off-peak hours, 146, or 19 percent of those, resulted in one or more suppliers failing the three pivotal supplier test. Under PJM's current offer mitigation rules, these suppliers were not subject to offer capping. A summary of the exempt interface results is presented in Table 2. A breakdown of the results for exempt interfaces is presented in Table 3. Table 3 shows that 180, or 24 percent, of the 756 tests applied to exempt interfaces during off-peak periods were applied to the AP South Interface with the remainder applied to the other three exempt interfaces. Table 3 also shows that 99, or 68 percent, of the 146 three pivotal supplier tests during off-peak periods with one or more failing owners were

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<sup>10</sup> Non-exempt transfer interfaces are those constraints defined as transfer interfaces and not subject to exemption from offer mitigation per section 6.4.1(d)(i) of the PJM Operating Agreement. Non-exempt transfer interfaces for which the three pivotal supplier test was applied during the study period and included in this analysis are the 5004/5005, Bedington-Black Oak, Kanawha-Matt Funk and PL North transfer interfaces. A list of interfaces used by PJM in real-time operations and in the day-ahead energy market may be found at [www.pjm.com/markets/energy-market/downloads/20031017-interface-definitions.xls](http://www.pjm.com/markets/energy-market/downloads/20031017-interface-definitions.xls) (35 KB).

for the AP South Interface, again with the remainder for the other three exempt interfaces.

## **Non-Exempt Interfaces**

There were a total of 5,241 tests applied in the real-time energy market to non-exempt interfaces during off-peak hours for the period March 1, 2006, through December 31, 2006. Of the 5,241 three pivotal supplier tests applied to non-exempt interfaces during off-peak hours, 2,584, or 49 percent of those, resulted in one or more suppliers failing the three pivotal supplier test. Under PJM's current offer mitigation rules, these suppliers were subject to offer capping.

## **Results for Regional Constraints**

Regional constraints are constraints that occur on the 500 kV system. The exempt and non-exempt interfaces are a subset of regional constraints. For comparison, three pivotal supplier test results are presented for non-exempt regional constraints which experienced 100 or more constrained hours during the period March 1, 2006, through December 31, 2006.

In 2006, several regional transmission constraints occurred for more than 100 hours in the real-time energy market. The Kammer 765/500 kV transformer, along with four interface constraints, the 5004/5005, AP South, Bedington-Black Oak and the Western Interfaces all experienced more than 100 hours of congestion in the real-time energy market in 2006.<sup>11</sup> The three pivotal supplier test was applied to all of these constraints. The AP South and Western Interfaces are two of the four interfaces for which generation owners are exempt from offer capping.

Table 3 includes information on the three pivotal supplier test results for the regional constraints with more than 100 hours of congestion in the real-time energy market in 2006 plus the two exempt interfaces with less than 100 hours of congestion.<sup>12</sup> For the listed regional constraints that are not exempt, the percentage of tested intervals resulting in one or more owners passing ranged from 79 percent to 88 percent while 25 percent to 34 percent of the tests showed one or more owners failing. For the AP South and Western Interfaces (both with more than 100 hours of congestion), which are exempt from offer capping, the percentage of tested intervals resulting in one or more owners passing ranged from 64 percent to 99 percent while 3 percent to 55 percent of the tests showed one or more owners failing.

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<sup>11</sup> The 5004/5005 Interface is comprised of two 500 kV lines, which include the Keystone-Juniata 5004 and the Conemaugh-Juniata 5005. These two lines are located between central and western Pennsylvania.

<sup>12</sup> The number of tests with one or more failing owners plus the number of tests with one or more passing owners can exceed the total number of tests applied. A single test can result in one or more owners passing and one or more owners failing. In such a case, the interval would be counted as including one or more passing owners and one or more failing owners.

The remaining two exempt interfaces, the Eastern and Central Interfaces, occurred for fewer than 100 hours. The Eastern Interface constraint occurred for 11 hours in 2006, while the Central Interface constraint occurred for 15 hours in 2006.<sup>13</sup> Table 3 shows that for these two interfaces the percentage of tested intervals resulting in one or more owners passing ranged from 60 percent to 100 percent while 25 percent to 40 percent of the tests showed one or more owners failing during peak periods and no owners failing during off-peak periods.

**Table 3 PJM Application of Three Pivotal Supplier Test to Regional Constraints**

Constraint	Period	Total Tests Applied	Tests with One or More Passing Owners	Percent Tests with One or More Passing Owners	Tests with One or More Failing Owners	Percent Tests with One or More Failing Owners
5004/5005 Interface	Peak	863	705	82%	253	29%
	Off Peak	209	183	88%	53	25%
Bedington - Black Oak	Peak	2,622	2,072	79%	889	34%
	Off Peak	3,254	2,708	83%	980	30%
Kammer	Peak	627	520	83%	194	31%
	Off Peak	925	763	82%	302	33%
AP South	Peak	491	327	67%	229	47%
	Off Peak	180	116	64%	99	55%
Western	Peak	852	846	99%	28	3%
	Off Peak	566	541	96%	47	8%
Central	Peak	16	13	81%	4	25%
	Off Peak	10	10	100%	0	0%
Eastern	Peak	20	12	60%	8	40%
	Off Peak	NA	NA	NA	NA	NA

### ***Results for Regional Constraints: Additional Details***

Additional information is provided for each of the regional constraints that occurred for more than 100 hours in 2006 plus the two exempt interfaces with less than 100 hours of congestion, including the average MW required to relieve a constraint, the average supply available, the average number of owners included in each test and the average number of owners that passed or failed each test.

Table 4 shows that, on average, during 2006 peak periods, the local markets created by the 5004/5005 Interface and the Kammer transformer had an average of 17 owners with available supply during the peak period, of which an average of 14 passed the three pivotal supplier test for the 5004/5005 Interface and an average of 13 passed the three

<sup>13</sup> See *2006 State of the Market Report*, Volume II, Section 7, "Congestion," at Table 7-12, "Regional constraints summary (by facility): Calendar years 2005 and 2006," p. 281.

pivotal supplier test for the Kammer transformer.<sup>14</sup> The local market created by Bedington-Black Oak had an average of 12 owners with available supply during on-peak and off-peak hours of which an average of nine owners passed the three pivotal supplier test. The local market created by AP South had an average of 16 owners with available supply during on-peak hours and an average of 15 during off-peak hours, of which 10 owners passed during on-peak periods and nine owners passed during off-peak periods. The local market created by the Western Interface had an average of 17 owners with available supply during on-peak hours and an average of 16 during off-peak hours, of which all 17 owners passed during on-peak periods and 15 owners passed during off-peak periods.

**Table 4 Three Pivotal Supplier Test Results for Regional Constraints – Additional Details: March 1, to December 31, 2006**

Constraint	Period	Average Constraint Relief (MW)	Average Effective Supply (MW)	Average Number Owners	Average Number Owners Passing	Average Number Owners Failing
5004/5005 Interface	Peak	110	397	17	14	3
	Off Peak	107	376	17	14	3
Bedington - Black Oak	Peak	57	220	12	9	3
	Off Peak	63	239	12	9	2
Kammer	Peak	83	285	17	13	4
	Off Peak	77	301	15	12	3
AP South	Peak	101	271	16	10	6
	Off Peak	97	306	15	9	6
Western	Peak	138	829	17	17	0
	Off Peak	140	739	16	15	1
Central	Peak	150	1,017	20	20	0
	Off Peak	177	722	18	14	4
Eastern	Peak	209	703	14	11	3
	Off Peak	NA	NA	NA	NA	NA

The remaining two exempt interfaces, the Eastern and Central Interfaces, occurred for fewer than 100 hours. Table 4 shows that, on average, the local market created by the Eastern Interface had 14 owners during peak periods of which 11 passed the test. The Eastern Interface was not constrained during off-peak periods in 2006. The local market created by the Central Interface had an average of 20 owners with available supply during on-peak hours and an average of 18 during off-peak hours, of which all 20 owners passed during on-peak periods and 14 owners passed during off-peak periods.

<sup>14</sup> The average number of owners passing and the average number of owners failing are rounded to the nearest whole number and may not sum to the average number of owners, also rounded to the nearest whole number.

## Process and Recommendations

Section 6.4.1(d)(ii) of Schedule 1 of the PJM Operating Agreement states:

On a quarterly basis, using an analysis no less stringent than the test for suspending offer capping set forth in sections 6.4.1(e) and (f) below, the PJM Market Monitoring Unit will evaluate whether additional interfaces also should be exempt and whether any existing exemptions should be terminated. Considering the recommendations of the PJM Market Monitoring Unit, the Office of the Interconnection shall determine whether to make a filing with the FERC proposing that an additional interface should be exempt or an existing exemption should be terminated. Any change in the exempt status of the interface shall become effective upon FERC acceptance. The Office of the Interconnection shall post a summary of the results of the PJM Market Monitoring Unit's quarterly analyses and the Office of the Interconnection's determination whether to make a filing with the FERC.

Section 6.4.1(e) of the PJM Operating Agreement states in part:

Notwithstanding the number of jointly pivotal suppliers in any hour, if the Market Monitoring Unit determines that a reasonable level of competition will not exist based on an evaluation of all facts and circumstances, it may propose to the Commission the removal of offer-capping suspensions otherwise authorized by this section. Such proposals shall take effect only upon Commission acceptance or approval.

The PJM market monitor recommends that the Commission terminate the exemption from offer capping currently applicable to generation resources used to relieve the Western, Central and Eastern reactive limits in the MAAC Control Zone and the AP South Interface. The PJM market monitor recommends that all constraints, including these interfaces, be subject to three pivotal supplier testing as specified in the PJM Operating Agreement. This recommendation is based on two factors.

The current exemption of the Western, Eastern and Central Interfaces is based on an analysis performed in 1997 and supported by the October 2004 report cited above. The current exemption of the AP South Interface is based on the October 2004 report. Neither analysis was as accurate as the current application of the three pivotal supplier test by PJM. The 1997 analysis was based on HHI and market share results for broad areas of the system and did not incorporate distribution factor impacts or analysis of incremental supply and demand associated with constraints. The October 2004 report was described above.

The primary reason to remove the exemptions for the identified interfaces is that they are no longer necessary given PJM's dynamic implementation of the three pivotal supplier test based on actual market conditions in real time. It is not necessary to make an *ex ante* decision about the market structure associated with individual interface constraints that applies for an extended period. Prior to the implementation of the three pivotal supplier test, all units required to resolve a constraint were offer capped whenever the constraint was binding. For the identified exempt interfaces, this could have resulted in the offer capping of a large number of units even when the relevant

market was structurally competitive. That is no longer the case. Under the current PJM dynamic approach, offer capping will be applied only as necessary and will be applied on a non-discriminatory basis for all units operating for all constraints.

The fact that some non-exempt constraints never had any generation resources that failed the three pivotal supplier test during the period analyzed does not lead to the conclusion that such constraints should always be exempt from offer capping for local market power. The same logic applies to currently exempt interface constraints. Even if no generation resources associated with any of the exempt interface constraints failed the three pivotal supplier test during the study period, that does not mean that such interfaces should always be exempt from offer capping for local market power. The fact that one or more generation resources required to resolve these interfaces did fail the three pivotal supplier test at times simply reinforces the point. If the generation resources associated with these interfaces always pass the three pivotal supplier test, there will be no offer capping and conversely if such resources at times fail the three pivotal supplier test, appropriate offer capping will be applied.

Local market power is clearly defined in the PJM Tariff and the appropriate local market power mitigation is also clearly defined in the PJM Tariff. The definition of local market power should apply to all constraints and the appropriate market power mitigation should also apply to all constraints.

The MMU recommends that three pivotal supplier testing be immediately and consistently applied to all constraints in the clearing of the day-ahead energy market and the results saved, so that analysis of the day-ahead market results can be performed.

The MMU recommends that PJM cooperate with the MMU to facilitate a complete and thorough review by the MMU of the actual implementation of the three pivotal supplier test in both the day-ahead and real-time markets including a detailed review of the relevant software and operating procedures. Such a review has not been done, and it is critical to ensure that the test is being properly applied.