Market Monitoring Unit

Exelon/PSEG Merger Analysis
Part Two

PJM Market Monitoring Unit

October 14, 2005

Introduction

This report was prepared by PJM's Market Monitoring Unit (MMU) in response to a series of requests from the New Jersey Board of Public Utilities (NJBPU). The first part of this report was provided to the NJBPU on May 24, 2005 in response to a letter dated March 29, 2005. This Part Two of the report is provided in response to a follow up request dated July 12, 2005 and amended via a letter of August 30, 2005. The report addresses the impact of the proposed merger between PSEG and Exelon on PJM wholesale markets. In particular, the report addresses the impact of the proposed merger on the Energy Market, the Capacity Market, the Regulation Market and the Spinning Reserve Market. The report also provides a calculation, for specific markets, of the level of mitigation in the form of divestiture that would be required in order to return the market structure measures to pre-merger levels and to levels consistent with Department of Justice (DOJ) Guidelines as well as an evaluation of the current mitigation proposal by the merging companies. This Part Two of the report closely follows the format, methods and content of the first part but adds analysis of the period from May 1 through July 31. This data was not available at the time the first report was prepared. The additional data includes a summer period and also includes a period after the May 1, 2005 integration of Dominion into the PJM system.

The BPU, in its letter of July 12, 2005, requested that the PJM MMU: update the analysis using more current data; analyze the impact of the merger on locational capacity markets that would be adopted under the RPM proposal; analyze the impact of the generation unit retirements proposed by PSEG and Exelon; analyze the impact of the merger on the New Jersey Basic Generation Service (BGS) market. The BPU, in its letter of August 30, 2005, reiterated and clarified its request for "analyses of the impact of the merger upon the anticipated locational capacity markets and upon N.J.'s Basic Generation Service ("BGS") Auction." The BPU made clear that the request for analysis of the impact of the merger on the locational capacity market should only follow a filing by PJM regarding capacity markets. That filing was made on August 30, 2005. The BPU also made clear that the request to analyze the impact of the merger on the BGS auction was related to the merger's potential impacts on the wholesale side of the auction process and more generally to "monitoring, intervention and market power mitigation measures."

The report updates the analysis using more current data. The report addresses the potential impact of the merger on locational capacity markets. The report incorporates the impact of generation unit retirements. The report addresses the potential impact of the merger on the wholesale side of the BGS auction. The report presents various approaches to market power analysis and the general role of the MMU is detailed in the PJM Market Monitoring Plan and in the State of the Market Reports prepared by the MMU. The approaches to market power analysis set forth in this report are generally applicable to wholesale power markets.

Table of Contents

1. Executive Summary

The analysis presented in this report covers the impact of the proposed merger on the structure of the PJM Energy Market, the PJM Capacity Market, the PJM Regulation Market and the PJM Spinning Reserves Market. The analysis examines market structure metrics in order to quantify the expected impact of the proposed merger on the market structure of the defined markets. The conclusions about the expected impact are based on the Department of Justice Horizontal Merger Guidelines and the Federal Energy Regulatory Commission's Merger Guidelines. The conclusion of the Part Two analysis confirms the part one conclusions that the proposed merger would significantly increase concentration in the Energy, Capacity and Regulation markets and therefore would likely create potential adverse competitive effects, absent mitigation. This concern about adverse competitive effects extends to the impact on the wholesale side of the BGS auction and to some potential locational capacity markets. The merging companies have proposed a mitigation strategy that is intended to address the increases in concentration.

Evaluation of the levels of mitigation proposed by the companies is a complex task. The impact of the proposed divestitures depends on the identification of the units to be divested, on the characteristics of the companies purchasing the divested units and on the nature of the divestiture.

For the aggregate Energy Market, the MMU defined the required level of divestiture in terms of MWh, based on the way in which the market actually clears. However, in order to translate the MWh of divestiture into MW of capacity, it is necessary to know the units that are to be divested, their MW of capacity and their corresponding MWh output. For the locational Energy Markets, the MMU determined that there is sufficient capacity in the proposed list of generating units available for divestiture to mitigate the identified market structure issues but that it is not possible to determine whether divestiture will in fact mitigate the issues without knowing the exact units and their distribution factor impacts on the identified constraints. This conclusion is based on the strong assumption that the sale of divested units is made to a company that currently has no position in the identified locational energy markets.

In fact, the conclusions about the required level of divestiture in the Energy Market depend on the nature of the companies purchasing the divested assets. The initial analysis assumes that the purchasing company has no capacity ownership in the relevant market. If the divested assets are sold to a company with a market share of from 16 percent to 35 percent, the proposed divestiture results in HHI levels that exceed the levels reached when the divested assets are sold to a company with a market share closer to five percent. In some cases the results after divestiture are worse than the results without divestiture. Conclusions about the required level of divestiture in the locational energy markets also depend on the nature of the companies purchasing the divested assets.

The locational energy markets most relevant to the BGS auction are the markets defined by the Eastern Interface and by the Keeney transformer. The conclusions related to these constraints apply to the impact on the BGS auction. In both cases, the merger would significantly increase concentration in the locational energy markets that serve the New Jersey BGS auction and therefore raises concerns about potential adverse competitive effects, absent mitigation.

For the aggregate Capacity Market, both the markets operated by PJM and the overall ownership of capacity were analyzed. For the markets operated by PJM, the MMU analysis shows that the companies' proposed divestiture would be adequate to meet the criteria specified in the Guidelines. For the overall ownership of capacity, the MMU analysis shows that the divestiture levels proposed by the merging companies are consistent with the Guidelines for the Total PJM and for PJM Mid-Atlantic markets under the assumption that divestiture is made to a single company that currently owns no capacity in PJM. For the overall ownership of capacity, the MMU analysis shows that the proposed divestiture levels are not consistent with the Guidelines for PJM East or for PJM East with any of the identified import cases under the assumption that divestiture is made to a single company that currently owns no capacity in PJM. The companies' proposal to offer capacity to the market at a zero price would be adequate mitigation for any otherwise unmitigated Capacity Market issue, as long as the definition of the capacity for sale is appropriate.

The identified locational capacity market most relevant to New Jersey is the PJM East capacity market. The proposed merger would significantly increase concentration in the PJM East capacity market and the proposed merger therefore raises concerns about potential adverse competitive effects, absent mitigation. In addition to the other total capacity analyses, the incremental locational Capacity Market in PJM East was analyzed. For the incremental locational Capacity Markets in PJM East, a proposed divestiture was defined that would be consistent with the Guidelines. This conclusion is based on the assumption that the sale of divested units is made to a single company that currently has no position in the identified Capacity Markets. Whether a proposed divestiture plan would be consistent with the Guidelines from the perspective of the incremental locational Capacity Markets in PJM East depends on the identity of the units divested and the number and nature of the purchasers.

The conclusions about the required level of divestiture in the Capacity Market depend on the number and nature of the companies purchasing the divested capacity. The initial analysis assumed that there is a single purchasing company with no capacity ownership in the relevant market. If the divested capacity is sold to a single company with a market share in the 10 to 15 percent range, the divestiture proposed by the merging companies results in increased HHI levels that exceed the criterion specified in the Guidelines by substantial margins. However, if the divested capacity is sold to five companies whose market shares averaged approximately two to three percent, the divestiture proposed by the merging companies results in HHIs that meet the criterion specified in the Guidelines.

For the regulation market, the MMU analysis shows that the companies' proposed divestiture could be adequate to meet the criteria specified in the Guidelines. In order to determine the impact of the proposed divestiture on the regulation market, it is necessary to know the units that are to be divested and their regulation capability. This conclusion is based on the assumption that the sale of divested units is made to a company that currently has no position in the regulation market.

The conclusions about the required level of divestiture depend on the nature of the companies purchasing the divested capacity. The initial analysis assumed that the purchasing company had no regulation ownership. If the divested regulation is sold to a company with a market share close to 20 percent, the proposed divestiture results in increased HHI levels that exceed the criterion specified in the Guidelines by more than the pre-divestiture case. If the divested capacity is sold to a company whose market share is five percent, the proposed divestiture results in HHIs that meet the criterion specified in the Guidelines.

No attempt was made to evaluate the virtual divestiture portion of the divestiture. Divestitures were treated in an undifferentiated manner in the MMU analysis. To the extent that virtual divestiture results in different incentives than does actual divestiture, the conclusions drawn in this analysis would need to be modified in a consistent manner.

The proposed merger is large and the potential impacts on the PJM markets are significant. It appears that appropriate mitigation, if structured in ways to address the issues identified in this report, can resolve the concerns about competitive impacts. The size of the current PJM footprint and the corresponding PJM markets makes it possible for a merger of this size to be considered and potentially to proceed with appropriate mitigation.

2. Methods of Analysis

The U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines (Guidelines) outline the enforcement policy of the Department of Justice and the Federal Trade Commission concerning horizontal mergers subject to section 7 of the Clayton Act, section 1 of the Sherman Act, and Section 5 of the FTC Act. As noted in the Guidelines, "the unifying theme of the Guidelines is that mergers should not be permitted to create or enhance market power or facilitate its exercise."[1]

The Guidelines use market concentration, measured by the HHI, as a basic metric of the structural competitiveness of a market. The Guidelines define three basic levels of market concentration while recognizing that "other things being equal, cases falling just above and just below a threshold present comparable competitive issues."[2] A market with an HHI of less than 1000 is considered to be unconcentrated. Mergers resulting in HHI level less than a 1000 are not considered to have adverse competitive effects. A market with an HHI between 1000 and 1800 is considered to be moderately concentrated. A merger in or resulting in a moderately concentrated market is not considered to have an adverse effect on competition if it increases the market's HHI by less than 100 points. A merger in or resulting in a moderately concentrated market is considered to "potentially raise significant competitive concerns" if it increases the market's HHI by 100 points or more.[3] A market with an HHI of 1800 or above is considered to be highly concentrated. A merger in or resulting in a highly concentrated market is not considered to have an adverse effect on competition if it increases the market's HHI by less than 50 points. A merger producing an increase in the market HHI of 50 points or more in a highly concentrated market "potentially raises significant competitive concerns."[4] The DOJ uses these HHI measures as a guideline, and the importance of a specific range is dependent on a number of other factors, such as the amount of demand response that exists in a given market.[5] "In determining whether a hypothetical monopolist would be in a position to exercise market power, it is necessary to evaluate the likely demand responses of consumers to a price increase."[6] All else held equal, where a lack of potential demand response might allow prices to be raised by more than a "small but significant and non-transitory" amount, "more market power is at stake in the relevant market than in a market in which a hypothetical monopolist would raise price by exactly five percent."[7]

The Federal Energy Regulatory Commission (FERC) "takes into account three factors in analyzing proposed mergers: the effect on competition, the effect on rates, and the effect on regulation."[8] In this report, the MMU will focus on the first factor used by FERC in analyzing mergers, as the other two factors are outside the scope of the request to the MMU.

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1 The U.S. Department of Justice and the Federal Trade Commission Horizontal Merger Guidelines (1997) p. 2.
2 Ibid, p. 15.
3 Ibid, p. 16.
4 Ibid, p. 16.
5 Ibid, p. 17.
6 Ibid, p. 4.
7 Ibid, p. 17.
8 77 FERC ¶ 61,263 (1996) Appendix A, p. 3.

For the evaluation of the effect of a merger on competition, FERC has adopted the "Department of Justice/Federal Trade Commission Merger Guidelines as the analytical framework for analyzing the effect on competition," of mergers as described in the Commission's Appendix A Merger analysis.[9]

In making the determination with respect to post-merger market power, the Commission's analytic screen focuses primarily on the market concentration analysis as detailed in the Guidelines. The concentration analysis requires the definition of product and geographic markets that are likely to be affected by a proposed merger and the measurement of concentration in those markets. The product and geographic market definitions used in the Commission analysis are designed to identify the pool of feasible alternative suppliers to the merged firm from a buyer's perspective, taking into account the costs of delivering the product and various measures of transmission capacity between potential suppliers and potential buyers, under varying market conditions (load levels).

The FERC defines two approaches to the ownership of capacity in a defined market, economic capacity and available economic capacity. The FERC has indicated that economic capacity" is the most important of the measures because it determines which suppliers may be included in the geographic market."[10] Economic capacity includes all the capacity from generating units whose variable costs are such that they could deliver energy to a relevant market, after paying all necessary transmission and ancillary service costs, at a price close to the competitive price in the relevant market. Available economic capacity is economic capacity net of native load (or contractually committed) obligations. The available economic capacity measure presumes that the lowest cost units are used to serve native load and other firm contractual obligations and would therefore not be available for other sales. The Commission notes that in markets with full retail access and a bid-based power exchange, this presumption, and measure of relevant capacity, may not be valid.[11]

The Commission approach requires analysis at a range of load and price levels because the combination of load and price levels are an indicator of the varying levels of competitive conditions that can exist in a market during a year. The Commission approach ensures that competition is evaluated for a representative range of market conditions.

Once the relevant markets and potential suppliers are identified, FERC's "Merger Policy Statement" indicates that a market can be characterized as unconcentrated when the market HHI is below 1000, equivalent to 10 firms with equal market shares; as moderately concentrated when market HHI is between 1000 and 1800; and highly concentrated when market HHI is greater than 1800, equivalent to between five and six firms with equal market shares.[12]

Where the analysis indicates that a proposed merger may significantly increase concentration in any of the relevant markets, the FERC then examines the merger in the context of the remaining four analytic steps from the Guidelines. This process involves an "examination of other factors that either address the potential for adverse competitive effect or that could mitigate or counterbalance the potential competitive harm."[13] FERC notes that "(s)uch factors include the ease of entry in the market or any efficiencies stemming from the

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9 77 FERC ¶ 61,263 (1996) pp. 3-4.
10 77 FERC ¶ 61,263 (1996) Appendix A.
11 77 FERC ¶ 61,263 (1996) Appendix A.
12 77 FERC ¶ 61,263 (1996) pp. 64-70.
13 77 FERC ¶ 61,263 (1996) Appendix A, p. 62.

merger."[14] Where such "additional factors examined do not mitigate or counterbalance the adverse competitive effects of the merger," remedial, mitigative conditions can be explored by FERC.[15] Such remedial, mitigative conditions or actions can include, but are not limited to transmission expansion and/or generation divestiture.[16]

The FERC's AEP Order defines the market structure characteristics that must be met for a market participant to be granted market based rates for three years.[17] The AEP Order indicates that an individual seller market share in excess of 20 percent is an indicator of market power and that an HHI of 2500 is an indicator of market power.

In the MMU analysis, the basic metrics used for each market include market share, the Herfindahl-Hirschman Index (HHI) and the Residual Supply Index (RSI). Market share measures the proportion of market output contributed by a supplier. Market share is calculated by dividing the output of a supplier by total supply in a market. Concentration ratios are a summary measure of market share. The concentration ratio used here is the Herfindahl-Hirschman Index (HHI), calculated by summing the squares of the market shares of all firms in a market.

Higher concentration ratios indicate that comparatively small numbers of sellers dominate a market while lower concentration ratios mean larger numbers of sellers split market sales more equally. Lower aggregate market concentration ratios establish neither that a market is competitive nor that participants are unable to exercise market power. Higher concentration ratios do, however, indicate an increased potential for participants to exercise market power. Despite their significant limitations, concentration ratios provide useful information on market structure.[18] The significance of various concentration ratio levels depends on the level of demand elasticity in the relevant market. Low elasticity of demand exacerbates the market power impact of any given concentration level. The elasticity of demand in the identified PJM markets is generally quite low.

The residual supply index (RSI) is a measure of the extent to which one or more generation owners are pivotal suppliers in a market. A single generation owner is pivotal if the output of the owner's generation facilities is needed to meet demand. Multiple generation owners are jointly pivotal when the output of the owners' generation facilities, taken together, is needed to meet demand. When a generation owner is pivotal, it has the ability to affect market price. For a given level of market demand, the RSI compares the market supply, net of the supply controlled by one or more generation owners, to the market demand. The RSI for generation owner "*i*" is [(Supply$_m$ - Supply$_i$)/(Demand$_m$)], where Supply$_m$ is total supply in the Energy Market including net imports.[19] Supply$_i$ is the supply owned by the individual generation owner or group of generation owners "*i*" and Demand$_m$ is total market demand. If the RSI is greater than 1.00, the supply of the specific generation owner or group of generation owners is not needed to meet market demand and that generation owner or group of generation

14 77 FERC ¶ 61,263 (1996) Appendix A, p. 62.
15 77 FERC ¶ 61,263 (1996) Appendix A, p. 62.
16 77 FERC ¶ 61,263 (1996) Appendix A, p. 82-85.
17 107 FERC ¶ 61,018 (2004) p. 8-9.
18 The best tests of market competitiveness are direct tests of the conduct of individual participants and their impact on price. The price-cost markup index is one such test and direct examination of offer behavior by individual market participants is another. However such tests of behavior are primarily relevant for the analysis of existing markets rather than of expected market structures.
19 Total supply in the Energy Market is the sum of all offers to provide energy. In the event the net imports are negative (exports), they are treated as additional demand.

owners has a reduced ability to influence market price. If the RSI is less than 1.00, the supply owned by the specific generation owner or group of generation owners is needed to meet market demand and the generation owner or group of generation owners is pivotal with a greater ability to influence price. When the RSI is reported for a market, the reported RSI is for the largest supplier or identified group of suppliers. As with concentration ratios, the RSI is not a bright line test. While a single owner RSI less than 1.0 clearly indicates market power, a single supplier RSI greater than 1.0 does not guarantee that there is no market power. As an example, suppliers can be jointly pivotal.

FERC's AEP Order indicates that a single supplier RSI of less than 1.0 is an indicator of market power.[20] PJM has argued that a three pivotal supplier RSI of greater than 1.0 is an indicator of a competitive market structure, even in the presence of market share and concentration results that exceed FERC guidelines for a competitive market structure.[21]

In the MMU analysis, the definition of the relevant market is based on substitutability which in turn is based on the physical facts of the system. The relevant markets include the entire RTO, locational energy and Capacity Markets defined by transmission constraints, regulation markets defined by the ability to provide regulation within a defined area as reflected in PJM operations and spinning markets defined by the ability to provide spinning reserves within a defined area as reflected in PJM operations. Exports and imports are included in the analysis in cases where they are a potential source of competition.

With respect to the BPU's requests for analysis, the locational energy markets most relevant to the BGS auction are the markets defined by the Eastern Interface and by the Keeney transformer while the identified locational capacity market most relevant to New Jersey is the PJM East capacity market.

The analysis presented in this report is based on actual PJM market data for various representative periods. The principal complicating factor in relying on actual market data is that PJM has integrated substantial new areas into its markets since May 1, 2004. The appropriate time period for analysis depends in part on the market. The periods for which data was analyzed in the first part of this report were selected based on the nature of the markets and the relevance of data from those periods to evaluating the ongoing structure of the markets. The relevant regulation market and the spinning reserve market are in the Mid-Atlantic region and are thus unaffected by the integrations. The full Energy and Capacity markets are affected the integrations. Locational Energy and Capacity markets are affected by the integrations in some cases. Part Two of the report analyzes the time period from May 1, 2005 through July 31, 2005. This period falls after the Dominion integration and no additional control area integrations occur within this period, although the ComEd capacity market was integrated into the PJM capacity market on June 1, 2005.

The MMU analysis relies on what FERC terms economic capacity, or total capacity without netting out of load obligations, also termed gross position. The merger filing also focuses on economic capacity.[22] Net positions would be calculated by subtracting the load obligation

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20 107 FERC ¶ 61,018 (2004) ("AEP Order").

21 107 FERC ¶ 61,018 (2004), at P 111 ("AEP Order").

22 "In any event, Available Economic Capacity is a questionable metric for defining market share in PJM. All capacity must be bid into the PJM market and selected to run before it can generate. Hence, irrespective of retail load commitments, all of a supplier's Economic Capacity is relevant to setting

from the supply of the relevant product for all participants that have both an obligation to purchase a product or to sell a product at a defined price and the ability to supply a product. Such companies, in this analysis, would be primarily integrated utility companies that have not yet been exposed to significant retail competition and that therefore retain most of their native load. A net position analysis would show the market results when the integrated utility companies retain their dominant position in the retail market. The gross position analysis shows the market results when the integrated utility companies either no longer have the retail load obligation or have separated their generation companies from the load serving affiliates of the integrated company so that their financial incentives no longer correspond to those of a fully integrated company. While the net position analysis illustrates the current incentives to increase prices based on current load obligations, another impact of higher prices that is not explicitly considered is the fact that high prices for the relevant product could serve as a barrier to entry by competitive retail suppliers who would have to pay the high price in order to compete with the incumbent utility. The gross position, or economic capacity, analysis seems more appropriate to the evaluation of the long-term impacts of a merger and is the approach taken here.

The MMU undertook an additional sensitivity analysis to evaluate the potential impact from the proposed retirement of assets by PSEG and Exelon. The table below summarizes all the units that have been retired in PJM and those facilities designated for retirement during the next two years, by retirement date. The PSEG units that had been retired prior to part one of the report are the Burlington 10 combined cycle unit and the Hudson 3 combustion turbine. The Exelon units that had been retired prior to part one of the report were the Delaware 7 and Delaware 8 steam units. The PSEG units that are anticipated to be retired in the next two years are the Hudson 1 steam unit and the Sewaren 1, 2, 3 and 4 steam units. The PSEG units that have been retired since part one of the report was completed are the Kearny 7 and 8 steam units on June 1, 2005. These retirements are accounted for in the analysis of competition in each defined market.

market prices. Thus, while I have presented an Available Economic Capacity analysis as required by the Commission's regulations, I have focused primarily on the Economic Capacity analysis in determining the effects of the merger on competition and in assessing the efficacy of mitigation." (Exhibit No. J-1 p. 51, Lines 20-26).

Table 2-1 Retired Units

Unit Name	Capacity	Fuel	Unit Type	Retire Date
PS BURL BU10 F	193	NATURAL GAS	STEAM	4/4/2004
PS HUDS 1 F	383	NATURAL GAS	STEAM	10/1/2007
PS HUDS 3 CT	129	JET A	CT	10/17/2003
PS KRNY 7 F	150	HEAVY OIL	STEAM	6/1/2005
PS KRNY 8 F	150	HEAVY OIL	STEAM	6/1/2005
PS SWRN 1 F	104	NATURAL GAS	STEAM	10/1/2007
PS SWRN 2 F	118	NATURAL GAS	STEAM	10/1/2007
PS SWRN 3 F	107	NATURAL GAS	STEAM	10/1/2007
PS SWRN 4 F	124	NATURAL GAS	STEAM	10/1/2007
PE DELA 7 F	128	HEAVY OIL	STEAM	3/5/2004
PE DELA 8 F	128	HEAVY OIL	STEAM	3/5/2004
BC GULD 3 F	104	NATURAL GAS	STEAM	12/1/2003
JC SAYV 4 F	114	NATURAL GAS	STEAM	2/19/2004
JC SAYV 5 F	115	NATURAL GAS	STEAM	2/19/2004
JC JNUG RIEGEL	27	NATURAL GAS	CT	1/1/2005
PN SWRD 5 F	136	COAL	STEAM	11/20/2003
PN SWRD 4 F	60	COAL	STEAM	11/20/2003
PN WARN 1 F	41	COAL	STEAM	9/28/2002
PN WARN 2 F	41	COAL	STEAM	9/28/2002
PN WARN 3 CT	79	LIGHT OIL	CT	10/1/2004
PN WYNE 1 CT	56	LIGHT OIL	CT	5/5/2004
ACE DPWT CT	24	NATURAL GAS	CT	5/1/2005
ACE VINE 7 F	8	HEAVY OIL	STEAM	6/17/2005
ACE VCLP NUG CT	47	NATURAL GAS	CT	6/25/2004
DPL MADI 1 CT	12	LIGHT OIL	CT	1/7/2005
COM CALUMET CT 31	56	NATURAL GAS	CT	7/1/2004
COM CALUMET CT 33	42	NATURAL GAS	CT	7/1/2004
COM CALUMET CT 34	51	NATURAL GAS	CT	7/1/2004
COM COLLINS 1	554	NATURAL GAS	STEAM	1/1/2005
COM COLLINS 2	554	NATURAL GAS	STEAM	1/1/2005
COM COLLINS 3	530	NATURAL GAS	STEAM	1/1/2005
COM COLLINS 4	530	NATURAL GAS	STEAM	1/1/2005
COM COLLINS 5	530	NATURAL GAS	STEAM	1/1/2005
COM CRAWFORD CT 31	59	NATURAL GAS	CT	3/1/2005
COM CRAWFORD CT 32	58	NATURAL GAS	CT	3/1/2005
COM CRAWFORD CT 33	59	NATURAL GAS	CT	3/1/2005
COM ELECT JC CT 31	59	NATURAL GAS	CT	1/1/2005
COM ELECT JC CT 32	59	NATURAL GAS	CT	1/1/2005
COM ELECT JC CT 33	59	NATURAL GAS	CT	1/1/2005
COM JOLIET CT 31	59	NATURAL GAS	CT	7/1/2004
COM JOLIET CT 32	57	NATURAL GAS	CT	7/1/2004
COM LOMBARD CT 32	31	NATURAL GAS	CT	1/1/2005
COM LOMBARD CT 33	32	NATURAL GAS	CT	1/1/2005
COM SABROOKE CT 31	25	NATURAL GAS	CT	1/1/2005
COM SABROOKE CT 32	25	NATURAL GAS	CT	1/1/2005
COM SABROOKE CT 33	24	NATURAL GAS	CT	1/1/2005
COM SABROOKE CT 34	13	NATURAL GAS	CT	1/1/2005

3. Energy Market

Methods of Analysis

The merger analysis of the Energy Market includes the aggregate Energy Market and defined locational markets. The aggregate Energy Market is analyzed based on actual market data and based on a representative aggregate supply curve.

In evaluating actual Energy Market results on a pre-merger and on a post-merger basis, the actual market configuration is a critical factor. There have been significant changes in the aggregate PJM markets resulting from the integration of ComEd, AEP, Dayton, Duquesne and Dominion. In each case the market has become larger and one or more significant participants have joined the PJM Energy Markets. While the use of actual market results is an advantage available to the MMU, actual market results must be interpreted carefully when evaluating the merger. In particular, there is a tradeoff between using historical data for the period prior to the integration of Dominion on May 1, 2005 and the need to reflect a full range of seasonal and demand conditions in the analysis. In interpreting the results of the historical analysis for the pre-Dominion integration period in part one of the report, it should be recognized that those market conditions no longer exist. Part Two of the report includes data only for the three month post–Dominion period from May 1 through July 31, 2005. In interpreting the results of the three month post-Dominion integration period, it should be recognized that these market conditions are representative of summer load conditions but are not representative of load conditions that occur on the PJM system during other seasons.

In addition to the historical analysis of actual Energy Market results, an analysis of a representative post-Dominion aggregate supply curve is included. The use of an aggregate Energy Market supply curve permits an analysis of expected market shares for Exelon and PSEG and for the combined company over a full range of potential seasonal and demand conditions in the aggregate Energy Market since the hourly demand from January 1, 2001 to July 31, 2005 was used in the analysis. This 55 month period represents a wide range of demand and thus provides a representative range of demand to fully analyze the merged company market share.

The MMU also examined locational Energy Markets, created by transmission constraints, that are affected by the proposed merger. These include the relatively broad markets created when the Western, Central and Eastern interfaces are constrained as well as the smaller market created when the Keeney Transformer is constrained.

Aggregate Energy Market- Market Structure Metrics

In order to evaluate the impact of the proposed merger on the Energy Market using actual historical market data, in part one of the report, several time periods were analyzed in order to ensure that the impacts of the integrations are reflected. The analysis of the hourly Energy Market here is done for one period. This period includes May 1, 2005 through July 31, 2005. The basic structure of the PJM markets changed significantly during these historical periods. This fact makes it impossible to analyze a full twelve months of historical data that reflects the current market structure. Other approaches to market analysis are also employed in this report in an effort to address this issue.

Market concentration levels were calculated on a pre-merger and a post-merger basis. Actual imports are explicitly accounted for in this analysis. HHIs were calculated for each hour using historical market data for the designated time periods with Exelon and PSEG as

separate companies and with the two companies combined. On average, the hourly Energy Market was moderately concentrated, both pre- and post-merger during this period (Table 3-1 and Table 3-2). The post-merger increase in average HHI was 263 points.

Table 3-1 Pre-Merger Hourly Energy Market HHI Results

	Minimum	Average	Maximum	Number of Hours HHI > 1800	Number of Hours HHI > 2500
May 1 - July 31	823	1142	1430	0	0

Table 3-2 Post-Merger Hourly Energy Market HHI Results

	Minimum	Average	Maximum	Number of Hours HHI > 1800	Number of Hours HHI > 2500
May 1 - July 31	1051	1405	1854	12	0

Table 3-3 Hourly Energy Market HHI Differences

	Minimum	Average	Maximum	Number of Hours HHI > 1800	Number of Hours HHI > 2500
May 1 - July 31	228	263	424	12	0

Market shares were calculated for the hourly Energy Market pre- and post-merger for all participants. In the pre-merger Energy Market, there are two participants with market shares in excess of 20 percent, [redacted] The proposed merger would create a new company with [redacted] in the aggregate Energy Market and continue to result in two participants with market shares in excess of 20 percent, [redacted]

Table 3-4 Pre-Merger Hourly Energy Market Shares

[redacted]

Table 3-5 Post-Merger Hourly Energy Market Shares

[redacted]

RSI levels were calculated for each hour in the aggregate Energy Market to determine the extent to which one supplier was pivotal and the extent to which three suppliers were jointly pivotal. The RSI results are reported using thresholds of 1.0 and 1.1 in order to show the sensitivity of the results to the choice of threshold and in recognition of the fact that the RSI is not a bright line test.

The pre-merger RSI results show that a single participant was pivotal for 9 hours during this period and the post-merger RSI results show that a single participant was pivotal for 132 hours, or about 6 percent of the hours, during this period (Table 3-6 and Table 3-7). The post-merger RSI results show an increase of 123 hours. The results also show that there are more hours during which the RSI was less than 1.10 than there are hours during which the RSI was less than 1.00, illustrating the sensitivity of the conclusions to the use of a specific RSI cutoff.

Table 3-6 Pre-Merger Hourly Single Pivotal Supplier RSI Results

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	148	7%	9	< 1%	1.55	0.98

Table 3-7 Post-Merger Hourly Single Pivotal Supplier RSI Results

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	380	17%	132	6%	1.41	0.89

Table 3-8 Hourly Single Pivotal Supplier RSI Differences

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	232	10%	123	6%	-0.14	-0.09

The pre-merger RSI results for three pivotal suppliers show that the three largest participants are jointly pivotal for 777 hours or about 35 percent of the hours in the period. (See Table 3-9.)

Table 3-9 Pre-Merger Hourly Three Pivotal Supplier RSI Results

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	1,090	50%	777	35%	1.09	0.69

The post-merger RSI results for three pivotal suppliers show the three largest participants are jointly pivotal for 1,302 hours, or 59 percent of the hours in the period. (See Table 3-10.)

Table 3-10 Post-Merger Hourly Three Pivotal Supplier RSI Results

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	1,663	76%	1,302	59%	0.95	0.60

Table 3-11 Hourly Three Pivotal Supplier RSI Differences

	Number of Hours RSI < 1.10	Percent of Hours RSI < 1.10	Number of Hours RSI < 1.00	Percent of Hours RSI < 1.00	Average RSI	Minimum RSI
May 1 - July 31	573	26%	525	24%	-0.14	-0.09

The results of the analysis of market structure indicators for the actual historical market data show that the proposed merger would increase HHI levels by 263 points in the period and would [redacted] with a market share [redacted]. There is a significant increase in the number of hours during which there is a single pivotal supplier and three jointly pivotal suppliers. These increases occur in the context where the average HHI in the post-merger market is 1405 and the number of hours in which the HHI exceeds 1800 is 12 and the HHI does not exceed 2500.

In order to determine the effects of generation retirements, all Exelon and PSEG owned units that will retire in the next two years were eliminated and the analysis was rerun. The results show that the post-merger average HHI increased by 3 points, post-merger market shares remain unchanged, the number of post-merger hours during which there is a single pivotal supplier increased by 20 hours and the number of post-merger hours during which there were three jointly pivotal suppliers increased by 70 hours.

Conclusion

The analysis shows that the proposed merger results in an increase in HHI that exceeds the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the Energy Market as defined by the standards of the Guidelines and as defined by these additional metrics and the proposed merger therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on those standards and Guidelines.

Mitigation

Mitigation in the form of divestiture could address the identified increase in market power as reflected in these metrics, but the effectiveness of the mitigation depends on assumptions about the units divested and the nature of the purchasers. For the aggregate Energy Market the MMU results show that the divestiture of 5,000 MWh of generation would reduce the post-merger HHI levels to pre-merger levels. For the aggregate Energy Market the MMU results show that the divestiture of 2,800 MWh of generation would reduce the post-merger HHI levels such that the increase is less than 100 points. This is consistent with the DOJ Guidelines when overall HHI levels are less than 1800. In each case, the divestiture analysis assumes that the divested generation is sold to a company with no generation ownership prior to the sale.

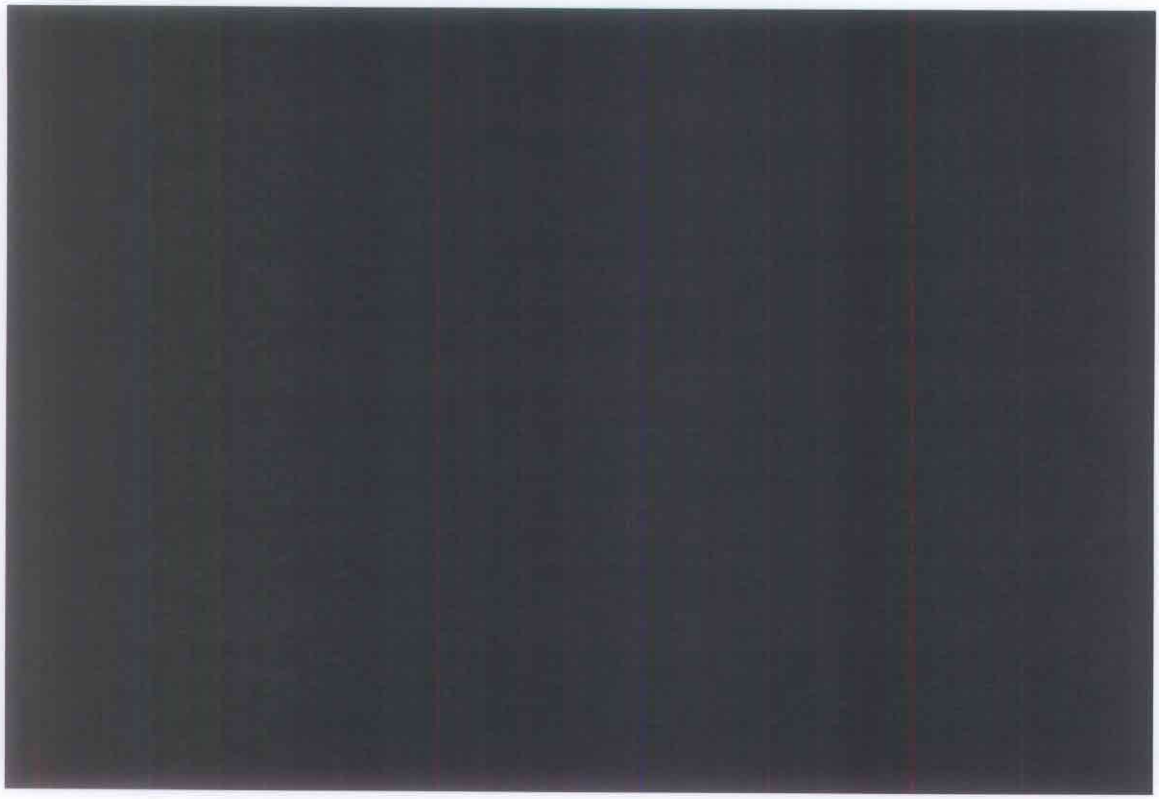
It is also critical to understand the relationship between MWh and MW. The MWh identified are produced by generating units with identifiable capacity in MW. The proposed divestiture of units cannot be evaluated with respect to the required MWh divestiture without identifying the exact units to be divested, their MW of capacity and their corresponding MWh outputs.

Aggregate Energy Market - Supply Curve

Market structure measures were calculated for sequential segments of the aggregate supply curve. The results provide a guide to ownership concentration both for cleared offers at various demand levels and for the incremental supply at these demand levels.

The PJM aggregate Energy Market supply curve was developed utilizing all generator market based offers including imports and including those in the expanded Dominion zone for May 1, 2005.[23] However, all Exelon and PSEG owned units that will retire in the next two years have been eliminated from the supply curve. Thus, this analysis includes the impact of all the market integrations and future retirements of units owned by either Exelon or PSEG on the PJM aggregate Energy Market supply curve. Market shares were calculated for Exelon and PSEG separately and for the combined company for each 25,000 MW block of energy in the supply curve. The aggregate supply curve and the ownership percentages are shown in Figure 3-1.

Figure 3-1 PJM RTO Aggregate Supply Curve for May 1, 2005



The data on market shares for Exelon and PSEG individually and combined for each portion of the supply curve are also shown in Table 3-12. The table shows the cumulative market share for the combined company for each successive level of demand. As with the supply curve, the table below excludes units owned by either Exelon or PSEG that has been designated for retirement within the next two years. The data show that [redacted] would own [redacted] of all generation in the first 25,000 MW section of the aggregate supply curve, [redacted] of all generation in the first 50,000 MW section of the aggregate supply curve and [redacted] of subsequent 25,000 MW sections of the aggregate supply curve. Part one of the report showed that [redacted] would own [redacted] of all generation in the first 25,000 MW section of the aggregate supply curve and [redacted] of all generation in the 50,000 MW section of the aggregate supply curve.

[23] The PJM aggregate supply curves are relatively stable from day to day.

Table 3-12 PJM RTO May 1, 2005 Aggregate Supply Curve Ownership by Demand MW Block

Supply Curve MW By Company: Percent of Supply Curve Segment		
RTO Supply Greater Than MW	RTO Supply Less Than MW	[redacted]
0	25,000	
25,000	50,000	
50,000	75,000	
75,000	100,000	
100,000	125,000	
125,000	150,000	
150,000	175,000	

The aggregate supply curve analysis shows the market shares of the individual companies and combined company under various demand conditions. The analysis demonstrates that the combined company would have a cumulative market share in [redacted] for the first 50,000 MW of demand and a cumulative market share in [redacted] for the entire supply curve, while showing generally lower incremental market shares by supply curve segment above 50,000 MW.

In order to determine the relevance of the concentration levels, a frequency distribution of PJM total demand including the effects of the Dominion integration was developed based on historical data for all areas included in the current PJM footprint (Table 3-13). [24] The table shows the distribution of annual hours by 25,000 MW blocks of load. In 2004, demand fell in the 25,000 to 50,000 MW block for 0.08 percent of the hours (7 hours), in the 50,000 to 75,000 MW block for 40.27 percent of the hours (3,537 hours), in the 75,000 to 100,000 MW block for 52.99 percent of the hours (4,655 hours) and in the 100,000 to 125,000 MW block for 6.66 percent of the hours (580 hours). In addition, the table shows the components of the 50,000 to 75,000 block. The frequency distribution is a function of weather and other factors affecting demand but it provides a measure of where on the supply curve the market is operating. The results are consistent with and thus confirm the actual calculated market shares for the post-merger combined company presented above.

Table 3-13 Calculated PJM RTO Demand by Block Including Dominion

Demand (MW) Greater Than	Demand (MW) Less Than or Equal to	2001	2002	2003	2004	Year to Date 2005
0	25,000	0.00%	0.00%	0.00%	0.00%	0.00%
25,000	50,000	2.01%	0.88%	0.18%	0.08%	0.28%
50,000	75,000	58.79%	52.37%	42.43%	40.27%	40.85%
75,000	100,000	35.99%	40.57%	51.70%	52.99%	48.77%
100,000	125,000	3.15%	6.12%	5.66%	6.66%	9.55%
125,000	150,000	0.06%	0.06%	0.02%	0.00%	0.55%
150,000		0.00%	0.00%	0.00%	0.00%	0.00%
Detail of High Percentage MW Load Blocks						
50,000	60,000	16.32%	13.05%	10.98%	8.44%	8.51%
60,000	75,000	42.47%	39.33%	31.45%	31.83%	32.33%

Table 3-13 includes data for the complete years of 2001 through 2004 and for the period from January 1 through July 31, 2005. The 2005 data is included for completeness, but as

24 In order to analyze total demand for the post-Dominion PJM footprint for years prior to the integration of Dominion on May 1, 2005, the hourly demand from January 1, 2001 to April 30, 2005 for each integrated zone was acquired directly from each zone and compiled to develop an hourly total post Dominion PJM footprint demand curve.

the 2005 data does not include the traditionally lower demand period from September through December, the data is not completely comparable to data for the prior entire years.

Locational Energy Markets

In addition to the analysis of the aggregate Energy Market, significant locational markets were also examined. In an LMP-based market, constraints create smaller, locational markets with different structural characteristics than the aggregate market. The relatively broad locational markets defined by the Western, Central and Eastern interfaces exist as separate markets when these interfaces are binding constraints. The locational eastern market created when the Keeney 500/230 kV transformer is constrained was also examined. The Keeney transformer was the only locational constraint in the east, occurring more than 100 hours in 2004, where the proposed merger had an impact on the market structure tests performed.

The analysis was performed utilizing real-time snapshots of actual generation conditions including output, real-time bids and bid limits coincident with occurrences of the constraints during the period May 1, 2005 through July 31, 2005. The analysis was done so as to be fully consistent with the way that PJM actually dispatches units to solve a constraint. As a result, detailed unit characteristics were explicitly accounted for, including: distribution factors; operational status; fuel type; start and notification time; minimum run time; steam units' ramp rates; and unit economic maximum and economic minimum limits.

The analysis included only units whose increased output would relieve the constraint. The objective was to simulate conditions in which the constraint was in effect and the system price was high enough that units whose output could be lowered to relieve the constraint would not be competitive. The higher the system price, the higher the effective cost of units for which lowering the output could relieve the constraint. The analysis considers all units whose increased output relieves the constraint, regardless of their effective cost.

This approach is consistent with the FERC approach that looks at a variety of demand conditions. FERC considers a supplier to have market power if the FERC screens are failed for any one of the identified demand conditions. The analysis here is not intended to and does not represent all demand conditions but it does represent demand conditions which are likely to occur for a significant number of hours. The analysis also represents the conditions under which the merging companies are most likely to have high market shares.

While the conclusions drawn in this analysis are generally consistent with those in part one of this report, there are some differences in the calculated metrics. The analysis in part one of the report was based on system conditions existing on October 30, 2004, whereas the current analysis is based on all on-peak occurrences during the May 1 through July 31, 2005 period. On May 1, 2005, Dominion was integrated into the PJM Market, adding approximately 20,000 MW of additional supply under PJM dispatch control. Depending upon system conditions, this additional supply may compete with other PJM resources in providing congestion relief.

An additional sensitivity analysis was performed in which units owned by Exelon and PSEG and designated for retirement during the next two years were removed from the analysis. For the constraints analyzed, the identified unit retirements did not affect the competitiveness of these locational markets. As part of its planning process, PJM routinely conducts an evaluation of reliability impacts resulting from system changes, including unit retirements, and may recommend transmission system reinforcements or other measures to address any violations that result from such changes. The analysis presented here is not intended to serve as a substitute for this PJM evaluation.

The locational energy markets most relevant to the BGS auction are the markets defined by the Eastern Interface and by the Keeney transformer. The conclusions related to these constraints apply to the impact on the BGS auction. In both cases, the merger would significantly increase concentration in the locational energy markets that serve the New Jersey BGS auction and therefore raises concerns about potential adverse competitive effects, absent mitigation.

Eastern Interface

The Eastern interface pre-merger results show that two participants have market shares in excess of 20 percent and jointly have [redacted] market share, that the HHI is 2641, that both the one pivotal and three pivotal suppliers test are passed. (See Table 3-16.) The "system total relief MW" are the total available MW of relief for the constraint. The MMU concludes that this market is structurally competitive on a pre-merger basis. The conclusion is based on the fact that, while the market fails the FERC's AEP Order market share and HHI metrics for market power, the market passes the three pivotal supplier test. This conclusion is consistent with the conclusion reached in the October 26, 2004 filing by the Market Monitoring Unit in Docket Nos. ER04-539-001, 002 and EL04-121-000.

The Eastern interface post-merger results show that two participants have market shares in excess of 20 percent and jointly have [redacted] market share, that the HHI is 3491, that the one pivotal supplier test is passed and that the three pivotal supplier test is failed. (See Table 3-17.)

The merger would result in an increase in the maximum market share of 5 percentage points, an increase in the HHI of 850 points and the failure of the three pivotal supplier test.

Conclusion

The analysis of the Eastern interface post merger shows that when the Eastern interface is constrained and the system price is high enough such that lowers are not cost effective, the proposed merger results in an increase in HHI that exceeds the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the locational Energy Market created by the Eastern Interface as defined by the standards of the Guidelines and the other identified metrics and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on the Guidelines.

Mitigation

The result of the merger could be mitigated in a number of ways. Effective mitigation would result from the application of PJM's locational market offer capping rules for the times when the locational market defined by the Eastern Interface is not competitive. Such mitigation would require a rule change as the Eastern Interface is currently exempt from offer capping because the locational market is competitive as corroborated by the pre-merger analysis. Effective mitigation would also result from an agreement of the merged company to offer units only at marginal cost as defined in the offer capping rules.

In addition, adequate divestiture could result in a structurally competitive market. For the market defined by the Eastern Interface, the required divestiture of total effective MW of supply necessary to return the post-merger HHI to the pre-merger level was determined. A supply curve was constructed comprised solely of combustion turbines (CTs) for which an increase in output provides relief for the constraint. The units comprising the supply curve were then ranked in ascending order of effective cost for each unit. Units were then selected

beginning with the lowest effective cost resource until the volume of required divestiture in terms of effective MW of supply was achieved. The ranking of resources by effective cost is a function of unit specific energy offers and distribution factors. It is therefore not possible to state definitively how many MW of capacity must be divested without an exact specification of the units.

Table 3-14 Eastern Interface Pre-Merger Results (Raise Only Relief)

[redacted]	System Total C Relief MW	[redacted]	HHI	[redacted]	Pivotal
	2784		2641		No
	2784		2641		No
	2784		2641		No
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes
	2784		2641		Yes

The MMU evaluated the mitigation proposal of Exelon. The analysis performed by the MMU was designed to determine whether a return to pre-merger HHI levels was achievable given the candidate facilities and total volume of CT capacity to be divested. The list of units identified above was compared to the candidate facilities for divestiture as listed in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket No. EC05-43-000 dated May 9, 2005. For the Eastern Interface, there was sufficient CT capacity available within the list of candidate facilities to return the post-merger HHI to pre-merger levels when such units are divested to a company with no generation assets in the market. There are two critical caveats to this conclusion: effective mitigation is, and can only be, based on specific units; and that the effectiveness of mitigation depends heavily on the nature of the purchasing companies. The effective MWs available to resolve the Eastern Interface are unit specific as they are based both on distribution factors and effective cost. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the actual identification of specific units. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. Given that the pre-merger level of HHI can be achieved, any intermediate post-merger level of HHI can also be achieved, with the same caveats.

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results under two additional scenarios. The first scenario assumed that the divested capacity is purchased by one existing company whose market share was 39 percent. The second scenario assumed that the divested capacity is purchased by an existing company whose market share is 6 percent. The post-merger HHIs were calculated for each scenario. A comparison of post-divestiture to pre-merger results is presented in Table 3-19. In both cases, the post-merger HHI increase was greater than in the base case divestiture scenario, in which divestiture was to a company with no generation assets in the market. The results also show that the increase in HHI above pre-merger levels in both cases exceeds the limit imposed by the Guidelines. The increase in HHI above pre-merger levels was less than the limit imposed by

the Guidelines when divestiture was to three companies with market shares below [redacted] While any specific divestiture requires detailed analysis, post-divestiture results are sensitive to the market position of the purchaser.

Table 3-15 Eastern Interface Post-Merger Results (Raise Only Relief)

[redacted]	System Total C Relief MW	[redacted]	HHI	[redacted]	Pivotal
	2784		3491		No
	2784		3491		No
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes
	2784		3491		Yes

Table 3-16 Eastern Interface Pre-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
2784	[redacted]	2641	4.43	4

Table 3-17 Eastern Interface Post-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
2784	[redacted]	3491	4.03	3

Table 3-18 Eastern Interface Summary Differences

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0	5%	850	-0.40	-1

Table 3-19 Eastern Interface Post-Divestiture Differences from Pre-Merger

Purchasing Company Market Share	System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0%	0	[redacted]	0	0	0
6%	0		123	0	-1
39%	0		836	-0.24	-1

Western Interface

The Western interface pre-merger results show that one participant has a market share in excess of 20 percent, that the HHI is 1172, that the one pivotal supplier test is passed and that the three pivotal supplier test is passed. (See Table 3-22.) The "system total relief MW" are the total available MW of relief for the constraint. The MMU concludes that this market is structurally competitive on a pre-merger basis. The conclusion is based on the fact that, while the market fails the FERC's AEP Order market share metric for market power, the market passes the three pivotal supplier test. This conclusion is consistent with the conclusion reached in the October 26, 2004 filing by the Market Monitoring Unit in Docket Nos. ER04-539-001, 002 and EL04-121-000.

The Western interface post-merger results show that one participant has a market share in excess of 20 percent, that the HHI is 1586, that the one pivotal supplier test is passed and that the three pivotal supplier test is passed. (See Table 3-23.)

The merger would result in an increase in the maximum market share of 10 percentage points and an increase in the HHI of 414 points.

Conclusion

The analysis of the Western interface post merger shows that when the Western interface is constrained and the system price is high enough such that lowers are not cost effective, the proposed merger results in an increase in HHI that exceeds the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the locational Energy Market created by the Western Interface as defined by the standards of the Guidelines and the other identified metrics and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on the Guidelines.

Mitigation

Mitigating the results of the merger is more complex for the Western Interface because, while the increase in HHI exceeds the Guidelines and the market share test is failed post merger, the market would be determined to be competitive under the three pivotal supplier test, as defined in this report. Effective mitigation would not result from the application of PJM's locational market offer capping rules for the times when a locational market is defined by the Western Interface because the market would be structurally competitive post merger based on the results of the three pivotal supplier test, as applied in this report. Effective mitigation would result from an agreement of the merged company to offer units only at marginal cost as defined in the offer capping rules.

In addition, adequate divestiture could result in a structurally competitive market. For the market defined by the Western Interface, the required divestiture of total effective MW of supply necessary to return the post-merger HHI to the pre-merger level was determined. A supply curve was constructed comprised solely of CTs for which an increase in output provides relief for the constraint. The units comprising the supply curve were then ranked in ascending order of effective cost for each unit. Units were then selected beginning with the lowest effective cost resource until the volume of required divestiture in terms of effective MW of supply was achieved. The ranking of resources by effective cost is a function of unit specific energy offers and distribution factors. It is therefore not possible to state definitively how many MW of capacity must be divested without an exact specification of the units.

The MMU evaluated the mitigation proposal of Exelon. The analysis performed by the MMU was designed to determine whether a return to pre-merger HHI levels was achievable given

the candidate facilities and total volume of CT capacity to be divested. The list of units identified above was compared to the candidate facilities for divestiture as listed in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket No. EC05-43-000 dated May 9, 2005. For the Western Interface, there was sufficient CT capacity available within the list of candidate facilities to return the post-merger HHI to pre-merger levels when such units are divested to a company with no generation assets in the market. There are two critical caveats to this conclusion: effective mitigation is, and can only be, based on specific units; and that the effectiveness of mitigation depends heavily on the nature of the purchasing companies. The effective MWs available to resolve the Western Interface are unit specific as they are based both on distribution factors and effective cost. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the actual identification of specific units. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. Given that the pre-merger level of HHI can be achieved, any intermediate post-merger level of HHI can also be achieved, with the same caveats.

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results under two additional scenarios. The first scenario assumed that the divested capacity is purchased by one existing company whose market share was 19 percent. The second scenario assumed that the divested capacity is purchased by an existing company whose market share is five percent. The post-merger HHIs were calculated for each scenario. A comparison of post-divestiture to pre-merger results is presented in Table 3-25. In both cases, the post-merger HHI increase was greater than in the base case divestiture scenario, in which divestiture was to a company with no generation assets in the market. The results also show that the increase in HHI above pre-merger levels for the case where the purchasing company had a 19 percent market share exceeds the limit imposed by the Guidelines while the increase in HHI above pre-merger levels for the case where the purchasing company had a five percent market share was less than the limit imposed by the Guidelines. While any specific divestiture requires detailed analysis, post-divestiture results are sensitive to the market position of the purchaser.

Table 3-20 Western Interface Pre-Merger Results (Raise only relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		No
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes
	3633		1172		Yes

Table 3-21 Western Interface Post-Merger Merger (Raise only relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		No
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes
	3633		1586		Yes

Table 3-22 Western Interface Pre-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
3633	[redacted]	1172	9.50	12

Table 3-23 Western Interface Post-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
3633	[redacted]	1586	8.31	11

Table 3-24 Western Interface Summary Differences

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0	10%	414	-1.19	-1

Table 3-25 Western Interface Post-Divestiture Differences from Pre-Merger

Purchasing Company Market Share	System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0%	0	[redacted]	0	0	0
5%	0		77	0.27	-1
19%	0		340	-0.46	-1

Central Interface

The Central interface pre-merger results show that two participants have market shares in excess of 20 percent, that the HHI is 1696, that the one pivotal supplier test is passed and that the three pivotal supplier test is passed. (See Table 3-28.) The "system total relief MW" are the total available MW of relief for the constraint. The MMU concludes that this market is structurally competitive on a pre-merger basis. The conclusion is based on the fact that, while the market fails the FERC's AEP Order market share metric for market power, the market passes the three pivotal supplier test. This conclusion is consistent with the conclusion reached in the October 26, 2004 filing by the Market Monitoring Unit in Docket Nos. ER04-539-001, 002 and EL04-121-000.

The Central interface post-merger results show that two participants have market shares in excess of 20 percent, that the HHI is 2353, that the one pivotal supplier test is passed and that the three pivotal supplier test is passed. (See Table 3-29.)

The merger would result in an increase in the maximum market share of 11 percentage points and an increase in the HHI of 657 points.

Table 3-26 Central Interface Pre-Merger Results (Raise Only Relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	3486		1696		No
	3486		1696		No
	3486		1696		No
	3486		1696		No
	3486		1696		No
	3486		1696		No
	3486		1696		No
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes
	3486		1696		Yes

Table 3-27 Central Interface Post-Merger Results (Raise Only Relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	3486		2353		No
	3486		2353		No
	3486		2353		No
	3486		2353		No
	3486		2353		No
	3486		2353		No
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes
	3486		2353		Yes

Table 3-28 Central Interface Pre-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
3486	[redacted]	1696	8.13	8

Table 3-29 Central Interface Post-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
3486	[redacted]	2353	6.88	7

Table 3-30 Central Interface Summary Differences

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0	11%	657	-1.25	-1

Table 3-31 Central Interface Post-Divestiture Differences from Pre-Merger

Purchasing Company Market Share	System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0%	0	[redacted]	0	0	0
6%	0		17	0.8	-1
20%	0		438	-0.07	-1

Conclusion

The analysis of the Central Interface post merger shows that when the Central interface is constrained and the system price is high enough such that lowers are not cost effective, the proposed merger results in an increase in HHI that exceeds the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the locational Energy Market created by the Central Interface as defined by the standards of the Guidelines and the other identified metrics and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on the Guidelines.

Mitigation

The result of the merger could be mitigated in a number of ways. Effective mitigation would not result from the application of PJM's locational market offer capping rules for the times when the locational market defined by the Central Interface is not competitive as the market is structurally competitive post merger using the three pivotal supplier test. Effective mitigation would result from an agreement of the merged company to offer units only at marginal cost as defined in the offer capping rules.

In addition, adequate divestiture could result in a structurally competitive market. For the market defined by the Central Interface, the required divestiture of total effective MW of supply necessary to return the post-merger HHI to the pre-merger level was determined. A supply curve was constructed comprised solely of CT's for which an increase in output provides relief for the constraint. The units comprising the supply curve were then ranked in ascending order of effective cost for each unit. Units were then selected beginning with the lowest effective cost resource until the volume of required divestiture in terms of effective MW of supply was achieved. The ranking of resources by effective cost is a function of unit specific energy offers and distribution factors. It is therefore not possible to state definitively how many MW of capacity must be divested without an exact specification of the units.

The MMU evaluated the mitigation proposal of Exelon. The analysis performed by the MMU was designed to determine whether a return to pre-merger HHI levels was achievable given the candidate facilities and total volume of CT capacity to be divested. The list of units identified above was compared to the candidate facilities for divestiture as listed in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket No. EC05-43-000 dated May 9, 2005. For the Central Interface, there was sufficient CT capacity available within the list of candidate facilities to return the post-merger HHI to pre-merger levels when such units are divested to a company with no generation assets in the market. There are two critical caveats to this conclusion: effective mitigation is, and can only be, based on specific units; and that the effectiveness of mitigation depends heavily on the nature of the purchasing companies. The effective MWs available to resolve the Central Interface are unit specific as they are based both on distribution factors and effective cost. It is not possible to evaluate a proposed divestiture of installed capacity without an exact

specification of the units. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the identification of specific units. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. Given that the pre-merger level of HHI can be achieved, any intermediate post-merger level of HHI can also be achieved, with the same caveats.

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results under two additional scenarios. The first scenario assumed that the divested capacity is purchased by one existing company whose market share was 20 percent. The second scenario assumed that the divested capacity is purchased by an existing company whose market share is six percent. The post-merger HHIs were calculated for each scenario. A comparison of post-divestiture to pre-merger results is presented in Table 3-31.In both cases, the post-merger HHI increase was greater than in the base case divestiture scenario, in which divestiture was to a company with no generation assets in the market. The results also show that the increase in HHI above pre-merger levels for the case where the purchasing company had a 20 percent market share exceeds the limit imposed by the Guidelines while the increase in HHI above pre-merger levels for the case where the purchasing company had a six percent market share was less than the limit imposed by the Guidelines. While any specific divestiture requires detailed analysis, post-divestiture results are sensitive to the market position of the purchaser.

Keeney 500/230 kV Transformer

The Keeney transformer pre-merger results show that three participants have market shares in excess of 20 percent, that the HHI is 2341, that the single pivotal supplier test is passed and that the three pivotal supplier test is failed. (See Table 3-34.) The MMU concludes that this market is structurally non-competitive on a pre-merger basis. The conclusion is based on the fact that the market fails the FERC's AEP Order market share metric for market power and that this metric failure is not offset by the three pivotal supplier test as the market also fails the three pivotal supplier test.

The Keeney transformer post-merger results show that three participants have market shares in excess of 20 percent, that the HHI is 2511, that the single supplier RSI is not less than 1.0 and that the three pivotal supplier test is failed. (See Table 3-35.)

The merger would not change the maximum market share. The HHI was increased by 170 points.

Conclusion

The analysis of the Keeney transformer post merger shows that when the Keeney transformer is constrained, the proposed merger results in an increase in HHI that exceeds the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the locational Energy Market created by the Keeney transformer as defined by the standards of the Guidelines and the other identified metrics and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on the Guidelines.

Mitigation

The result of the merger could be mitigated in a number of ways. Effective mitigation would result from the continued application of PJM's locational market offer capping rules for the

times when the locational market defined by the Keeney transformer is not competitive. Effective mitigation would also result from an agreement of the merged company to offer units only at marginal cost as defined in the offer capping rules.

In addition, adequate divestiture could result in a return to pre-merger HHI levels. A supply curve was constructed comprised solely of CT's for which an increase in output provides relief for the constraint. The units comprising the supply curve were then ranked in ascending order of effective cost for each unit. Units were then selected beginning with the lowest effective cost resource until the volume of required divestiture in terms of effective MW of supply was achieved. The ranking of resources by effective cost is a function of unit specific energy offers and distribution factors. It is therefore not possible to state definitively how many MW of capacity must be divested without an exact specification of the units.

The MMU evaluated the mitigation proposal of Exelon. The analysis performed by the MMU was designed to determine whether a return to pre-merger HHI levels was achievable given the candidate facilities and total volume of CT capacity to be divested. The list of units identified above was compared to the candidate facilities for divestiture as listed in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket No. EC05-43-000 dated May 9, 2005. For the Keeney transformer, there was sufficient CT capacity available within the list of candidate facilities to return the post-merger HHI to pre-merger levels when such units are divested to a company with no generation assets in the market. There are two critical caveats to this conclusion: effective mitigation is, and can only be, based on specific units; and that the effectiveness of mitigation depends heavily on the nature of the purchasing companies. The effective MWs available to resolve the Keeney transformer are unit specific as they are based both on distribution factors and effective cost. It is not possible to evaluate a proposed divestiture of installed capacity without an exact specification of the units. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the identification of specific units. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. Given that the pre-merger level of HHI can be achieved, any intermediate post-merger level of HHI can also be achieved, with the same caveats.

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results under two additional scenarios. The first scenario assumed that the divested capacity is purchased by one existing company whose market share was 28 percent. The second scenario assumed that the divested capacity is purchased by an existing company whose market share is three percent. The post-merger HHIs were calculated for each scenario. A comparison of post-divestiture to pre-merger results is presented in Table 3-37. In both cases, the post-merger HHI increase was greater than in the base case divestiture scenario, in which divestiture was to a company with no generation assets in the market. The results also show that the increase in HHI above pre-merger levels for the case where the purchasing company had a 28 percent market share exceeds the limit imposed by the Guidelines while the increase in HHI above pre-merger levels for the case where the purchasing company had a three percent market share was less than the limit imposed by the Guidelines. While any specific divestiture requires detailed analysis, post-divestiture results are sensitive to the market position of the purchaser.

Table 3-32 Keeney Transformer Pre-Merger Results (Raise Only Relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	620		2341		No
	620		2341		No
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes
	620		2341		Yes

Table 3-33 Keeney Transformer Post-Merger Results (Raise Only Relief)

[redacted]	System Total Relief MW	[redacted]	HHI	[redacted]	Pivotal
	620		2511		No
	620		2511		No
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes
	620		2511		Yes

Table 3-34 Keeney Transformer Pre-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
620	[redacted]	2341	3.35	3

Table 3-35 Keeney Transformer Post-Merger Summary

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
620	[redacted]	2511	3.35	3

Table 3-36 Keeney Transformer Summary Differences

System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0	0%	170	0	0

Table 3-37 Keeney Transformer Post-Divestiture Differences from Pre-Merger

Purchasing Company Market Share	System Total Relief MW	Largest Market Share	HHI	RSI	Number Jointly Pivotal
0%	0	[redacted]	0	0	0
3%	0	[redacted]	2	0	0
28%	0	[redacted]	170	0	0

4. Capacity Market

Methods of Analysis

Each organization serving PJM load must own or acquire capacity resources to meet its respective capacity obligations. Load-serving entities (LSEs) can acquire capacity resources by entering into bilateral agreements, by participating in the PJM-operated Capacity Credit Market or by constructing generation. Collectively, all arrangements by which LSEs acquire capacity are known as the Capacity Market.[25] As a result of the structure of the PJM Capacity Market, demand for capacity is extremely inelastic. This fact needs to be accounted for in any analysis of the competitive impacts of the proposed merger.

In evaluating actual Capacity Market results on a pre-merger and on a post-merger basis, the actual market configuration is a critical factor. There have been significant changes in the aggregate PJM markets resulting from the integration of ComEd, AEP, Dayton, Duquesne and Dominion. In each case the market has become larger and one or more significant participants have joined the PJM Energy Markets. The actual market results presented in this Part Two include data from May 1 through July 31, 2005 and therefore include the impacts both of the integration of Dominion on May 1 and of the ComEd capacity market on June 1, 2005.

The merger analysis of the Capacity Market includes the aggregate Capacity Market and defined locational Capacity Markets. The aggregate Capacity Market is analyzed from two perspectives. The operation of the PJM daily, monthly and multi-monthly Capacity Markets is analyzed. Transactions in the PJM Capacity Markets include less than 10 percent of total PJM capacity while the balance is either in bilateral markets or self supply. The overall Capacity Market, including ownership of all capacity in PJM, is also analyzed.

The MMU examined locational Capacity Markets, created by transmission constraints that are affected by the proposed merger. These include the relatively broad PJM Mid-Atlantic and PJM East markets. The locational Capacity Markets were evaluated both based on total capacity in each area plus imports and based on the incremental supply curves likely to be actually available to solve transmission constraints in a locational Capacity Market. Regardless of the final details of any locational capacity market construct in PJM, Capacity Markets have locational features and the locational results are relevant to evaluating the potential impact of the proposed merger on the competitiveness of the Capacity Markets.[26] The identified locational capacity market most relevant to New Jersey is the PJM East capacity market. The proposed merger would significantly increase concentration in the PJM East capacity market and the proposed merger therefore raises concerns about potential adverse competitive effects, absent mitigation.

Market structure metrics are calculated for the period from May 1, 2005 through July 31, 2005, including market shares, HHI and RSI metrics. This period includes the impact of the integrations of AEP, Dayton, Duquesne, Dominion and ComEd. The approach here is to calculate the market structure metrics for actual market data for the defined period and then to recalculate the market structure metrics treating PSEG and Exelon as a single company. The analysis covers the full PJM footprint as well as the potential smaller eastern locational

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25 See PJM State of the Market Report, Appendix H, "Glossary," for definitions of PJM Capacity Credit Market terms.

26 PJM filed the proposed RPM with FERC on August 30, 2005 in dockets ER05-1410-000 and EL05-148-000.

markets that are expected to be created under any likely modification to the Capacity Market design with a locational element.

For all of the Capacity Market analyses, unforced capacity was used as the measure of capacity. Unforced capacity takes into account imports, exports, unit specific purchases and sales, Capacity Credit Market transactions and unit specific EFORd. For smaller locational markets, unforced capacity was also used but actual imports into specific zones were not automatically reflected as capacity is not accounted for on that basis in the current capacity market design. Imports into zones are addressed explicitly in the analysis, as indicated.

Capacity Market – Historical PJM-Operated Market Results

The PJM Capacity Credit Market[27] provides a mechanism to balance supply and demand for capacity unmet by the bilateral market or self-supply. The PJM Capacity Credit Market consists of the Daily, Interval,[28] Monthly and Multimonthly Capacity Credit Markets. Each Capacity Credit Market is intended to provide a transparent, market-based mechanism for competitive retail LSEs to acquire the capacity resources needed to meet their capacity obligations and to sell capacity resources when no longer needed to serve load. The PJM Daily Capacity Credit Market permits LSEs to match capacity resources with short-term shifts in retail load while Interval, Monthly and Multimonthly Capacity Credit Markets provide mechanisms to match longer term obligations with capacity resources.

The MMU structural analysis of actual capacity auctions run by PJM during the defined period indicates that the PJM Capacity Credit Markets exhibited low levels of concentration in the Daily Capacity Credit Market and moderate levels of concentration in the Monthly and Multimonthly Capacity Credit Markets on a pre-merger basis. Actual imports and exports of capacity are explicitly accounted for in this analysis. As shown in Table 4-1 and Table 4-2 for the pre-merger case, HHIs for the Daily Capacity Credit Market averaged 847 with a maximum of 1014 and a minimum of 674. None of the daily auctions had HHIs in excess of 1800. HHIs for the longer term Monthly and Multimonthly Capacity Credit Markets averaged 1510, with a maximum of 4838 and a minimum of 1069. About 19 percent of the longer term auctions had HHIs in excess of 1800, while almost 13 percent had HHIs in excess of 2500.

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27 All PJM Capacity Market values (capacities) are in terms of unforced MW.

28 PJM defines three intervals for its Capacity Markets. The first interval extends for five months and runs from January through May. The second interval extends for four months and runs from June through September. The third interval extends for three months and runs from October through December.

Table 4-1 PJM Capacity Market Pre-Merger and Post-Merger HHI: May 2005 through July 2005

Pre-Merger	**Statistic**	**Daily**	**Monthly & Multimonthly**
HHI	Average	847	1510
	Minimum	674	1069
	Maximum	1014	4838
Highest Market Share		[redacted]	
Post-Merger			
HHI	Average	897	1510
	Minimum	674	1069
	Maximum	1186	4838
Highest Market Share		[redacted]	
Difference			
HHI	Average	50	0
	Minimum	0	0
	Maximum	172	0
Highest Market Share		4.0%	0.0%

Table 4-2 PJM Capacity Market Pre-Merger and Post-Merger HHI Auction Data: May 2005 through July 2005

Pre-Merger	Daily	Monthly & Multimonthly
# Auctions	92	16
# Auctions with HHI >=2500	0	2
% Auctions with HHI >=2500	0.0%	12.5%
# Auctions with HHI >=1800	0	3
% Auctions with HHI >=1800	0.0%	18.8%
Post-Merger		
# Auctions with HHI >=2500	0	3
% Auctions with HHI >=2500	0.0%	18.8%
# Auctions with HHI >=1800	0	3
% Auctions with HHI >=1800	0.0%	18.8%
Difference		
# Auctions with HHI >=2500	0	1
% Auctions with HHI >=2500	0.0%	6.3%
# Auctions with HHI >=1800	0	0
% Auctions with HHI >=1800	0.0%	0.0%

As shown in Table 4-3 and Table 4-4 for the pre-merger case, one pivotal RSI levels averaged 4.74 for the Daily Capacity Credit Markets and none of the auctions had three or fewer pivotal suppliers. One pivotal RSI levels for the Monthly and Multimonthly Capacity Credit Markets averaged .78. Approximately 63 percent of these auctions had a single pivotal supplier, while almost 88 percent of these auctions had three or fewer pivotal suppliers.

Table 4-3 PJM Capacity Market Pre-Merger and Post-Merger RSI: May 2005 through July 2005

Pre-Merger	Statistic	Daily	Monthly & Multimonthly
RSI	Average	4.74	0.78
	Minimum	2.56	0.16
	Maximum	6.19	2.39
Post-Merger RSI	Average	4.65	0.78
	Minimum	2.56	0.16
	Maximum	5.94	2.39
Difference RSI	Average	-0.09	0.00
	Minimum	0.00	0.00
	Maximum	-0.25	0.00

Table 4-4 PJM Capacity Market Pre-Merger and Post-Merger RSI Auction Data: May 2005 through July 2005

Pre-Merger	Daily	Monthly & Multimonthly
# Auctions	92	16
# Auctions with RSI <= 1.0	0	10
% Auctions with RSI <= 1.0	0.0%	62.5%
# Auctions with <= 3 Pivotal Suppliers	0	14
% Auctions with <= 3 Pivotal Suppliers	0.0%	87.5%
Post-Merger		
# Auctions with RSI <= 1.0	0	10
% Auctions with RSI <= 1.0	0.0%	62.5%
# Auctions with <= 3 Pivotal Suppliers	0	14
% Auctions with <= 3 Pivotal Suppliers	0.0%	87.5%
Difference		
# Auctions with RSI <= 1.0	0	0
% Auctions with RSI <= 1.0	0.0%	0.0%
# Auctions with <= 3 Pivotal Suppliers	0	0
% Auctions with <= 3 Pivotal Suppliers	0.0%	0.0%

The MMU structural analysis of actual capacity auctions run by PJM during the defined period, assuming that the proposed merger takes place, indicates that the PJM Capacity Credit Markets exhibited low post-merger levels of concentration in the Daily Capacity Credit Market and moderate post-merger levels of concentration in the Monthly and Multimonthly Capacity Credit Markets. As shown in Table 4-1 and Table 4-2 for the post-merger case, HHIs for the Daily Capacity Credit Market averaged 897, an increase of 50 points from the pre-merger value, with a maximum of 1186 and a minimum of 674. None of the post-merger daily auctions had HHIs in excess of 1800, which was the same as the pre-merger levels. Post-merger HHIs for the longer term Monthly and Multimonthly Capacity Credit Markets averaged 1510, with a maximum of 4838 and a minimum of 1069. These values were the same as the pre-merger average. Approximately 19 percent of the longer term auctions had post-merger HHIs in excess of 2500, which was about 6 percent higher than the pre-merger percentage. The percentage of longer term auctions that had HHIs above 1800 was the same for both pre-merger and post-merger scenarios (19 percent).

The analysis of actual capacity auctions run by PJM indicates that post-merger one pivotal RSI levels (Table 4-3 and Table 4-4) averaged 4.65 for the Daily Capacity Credit Markets, which was a decrease of 0.09 from the pre-merger values. None of the daily auctions had three or fewer pivotal suppliers. Post-merger one pivotal RSI levels for the Monthly and Multimonthly Capacity Credit Markets averaged 0.78, which was the same as the pre-merger value, while the percentage of auctions with a single pivotal supplier and with three pivotal suppliers remained at pre-merger levels.

The analysis of PJM-operated capacity markets shows that the proposed merger results in post-merger HHIs that meet the standards specified in the Guidelines for both the daily and monthly/multi-monthly markets.

Capacity Market – Total Capacity

The market structure for total capacity in the aggregate PJM market, including Dominion and ComEd, and for total capacity in defined locational Capacity Markets was also evaluated.[29] The analysis uses capacity ownership as of July 31, 2005. The analysis of total capacity is included as it represents conditions in the capacity market without regard to whether capacity is sold in bilateral or PJM operated markets. This evaluation is relevant because less than 10 percent of capacity is traded in PJM operated markets. This evaluation is also relevant to the any proposed capacity market design in which all capacity will be traded. In particular, the total capacity in locational Capacity Markets for Total PJM, PJM East and PJM Mid-Atlantic were evaluated. PJM East is defined to include the PECO, PSEG, JCPL, RECO, AECO and DPL zones, while PJM Mid-Atlantic includes the original PJM zones (PECO, PSEG, JCPL, RECO, AECO, DPL, BGE, METE, PENE, PEPC and PPL). Table 4-5 and Table 4-6 show the results for both the pre-merger and post-merger cases.

For the pre-merger case, the concentration level is low for Total PJM and the maximum market share is less than 20 percent. For PJM East, the concentration level is high and the maximum market share is [redacted]. Concentration levels are in the moderate range for PJM East with three of the four import scenarios and concentration levels are high in the case where a single existing company accounts for all the imports. The maximum market share exceeds 20 percent for PJM East under all import scenarios and a single pivotal supplier exists in each defined market.

[29] PJM East and PJM Mid-Atlantic are terms used by William Hieronymous in the merger filing.

Since PJM East may import capacity, analysis was performed with imports equal to 8,000 MW, the capacity import limit for PJM East. The following import cases were analyzed on both a pre-merger and post-merger basis:

1. An 8,000 MW import from a single company with no other PJM capacity resources;
2. An 8,000 MW import from five separate companies, each with no other PJM capacity resources;
3. An 8,000 MW import from an existing single company with PJM capacity resources that has a market share in the ten to fifteen percent range;
4. An 8,000 MW import from five existing separate companies, each with PJM capacity resources and each with a market share less than one percent.

As shown in Table 4-5, accounting for imports of 8,000 MW from a single company with no existing capacity ownership or multiple companies with no existing capacity ownership, reduced HHIs in eastern PJM from a highly concentrated level to moderate levels of concentration, although the HHI with imports from a single new company was 1782, quite close to the 1800 cutoff. As also shown in Table 4-5, accounting for imports of 8,000 MW from a single company with existing capacity ownership in the 10 to 15 percent market share range increased the HHI in eastern PJM so that ownership remained highly concentrated, only more so. As also shown in Table 4-5, accounting for imports of 8,000 MW from multiple companies with existing capacity ownership and each with a market share less than one percent reduced the HHI in eastern PJM to the moderate level.

Table 4-5 PJM Capacity Pre-Merger and Post-Merger HHI as of July 31, 2005

Pre-Merger	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
HHI	899	1110	2132	1782	1390	2227	1393
Highest Market Share	[redacted]						
Post-Merger							
HHI	1134	1648	4025	2930	2538	3375	2541
Highest Market Share	[redacted]						
Difference							
HHI	235	538	1893	1148	1148	1148	1148
Highest Market Share	7.1%	15.0%	29.1%	22.7%	22.7%	15.8%	22.7%

Table 4-6 PJM Capacity Pre-Merger and Post-Merger RSI as of July 31, 2005

Pre-Merger	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
RSI	0.89	0.81	0.57	0.82	0.82	0.74	0.82
Pivotal Suppliers	1	1	1	1	1	1	1
Post-Merger							
RSI	0.81	0.66	0.33	0.57	0.57	0.57	0.57
Pivotal Suppliers	1	1	1	1	1	1	1
Difference							
RSI	-0.08	-0.15	-0.24	-0.25	-0.25	-0.17	-0.25
Pivotal Suppliers	0	0	0	0	0	0	0

For the post-merger case, the results of the analysis (Table 4-5 and Table 4-6) show that concentration is moderate for the total PJM and PJM Mid-Atlantic markets while concentration is high in PJM East, regardless of the assumptions about capacity imports. The results also show that there is a single pivotal supplier in every case. The HHI increases by 235 points for PJM, by 538 for PJM Mid-Atlantic, by 1893 for PJM East without consideration of potential import diversity and by 1148 when import diversity is assumed. The analysis of total capacity shows that the proposed merger results in an increase in HHIs that exceed the increase specified in the Guidelines for the aggregate market as well as for the more locational markets. The proposed merger would significantly increase concentration in the Capacity Market as defined by the standards of the Guidelines and as defined by these additional metrics and the proposed merger therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on those standards and Guidelines.

Capacity Market – Locational Markets – Incremental Analysis

Given the potential for a locational Capacity Market in eastern PJM, additional analysis was performed for the eastern PJM Capacity Market to more accurately reflect the incremental way in which a locational Capacity Market would clear. A supply curve for capacity in eastern PJM was created using the incremental cost of capacity by unit. Using the capacity obligation for eastern PJM as the demand, two levels of demand (25 and 50 percent of the total demand) were used to segment the supply curve for capacity in eastern PJM. These two demand levels bracket the best estimate of the level of capacity in eastern PJM that would clear in the aggregate market and correspondingly the level of incremental capacity remaining in eastern PJM to meet the remaining demand for capacity when transmission constraints are binding in the Capacity Market. In a Capacity Market with locational features, when the eastern PJM Capacity Market becomes constrained, remaining demand would have to be met by remaining eastern PJM resources. Some eastern PJM resources would clear in the market prior to the eastern constraint becoming binding. The remaining resources, those that did not clear in merit order in the market, constitute the available incremental supply curve for eastern PJM. The same logic would apply to any locational Capacity Market.

The locational incremental market structure metrics were calculated for eastern PJM for each segment of the supply curve based on capacity as of July 31, 2005. The market structure metrics were calculated assuming that 25 percent and 50 percent of existing resources cleared in the overall market prior to the eastern constraint binding. In the case where 25 percent of existing resources cleared in the overall market, the incremental supply curve for eastern PJM available to meet demand in the constrained eastern market includes the remaining 75 percent of existing resources. In the case where 50 percent of existing resources cleared in the overall market, the incremental supply curve for eastern PJM includes the remaining 50 percent of existing resources.

The results of the locational incremental analysis for eastern PJM (Table 4-7 and Table 4-8) show that, in both cases, pre-merger HHIs are in the moderate range, that maximum market share exceeds 20 percent in the 75 percent incremental case, and that there is a single pivotal supplier in both cases.

Table 4-7 PJM East Capacity Pre-Merger and Post-Merger Locational Incremental HHI as of July 31, 2005

	75% Incremental	50% Incremental
Pre-Merger		
HHI	1567	1031
Highest Market Share	[redacted]	[redacted]
Post-Merger		
HHI	2721	1441
Highest Market Share	[redacted]	[redacted]
Difference		
HHI	1154	410
Highest Market Share	23.8%	10.4%

Table 4-8 PJM East Capacity Pre-Merger and Post-Merger Locational Incremental HHI and RSI as of July 31, 2005

	75% Incremental	50% Incremental
Pre-Merger		
RSI	0.72	0.76
Pivotal Suppliers	1	1
Post-Merger		
RSI	0.49	0.66
Pivotal Suppliers	1	1
Difference		
RSI	-0.23	-0.10
Pivotal Suppliers	0	0

Table 4-7 and Table 4-8 also show that post-merger HHIs are in the moderate to high range with increases in HHI of 410 and 1154 points, that the highest market share also increased by 23.8 percentage points and 10.4 percentage points (both cases are now above 20 percent) and that pivotal supplier results (RSI) also deteriorated. The analysis of locational incremental capacity in eastern PJM shows that the proposed merger results in an increase in HHIs that exceed the increase specified in the Guidelines. The proposed merger would significantly increase concentration in the eastern PJM capacity market as defined by the standards of the Guidelines and as defined by these additional metrics and the proposed merger therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on those standards and Guidelines.

Conclusion – Capacity Market

The analysis of PJM-operated capacity markets shows that the proposed merger results in post-merger HHIs that meet the standards specified in the Guidelines for both the daily and monthly/multi-monthly markets. The analyses of the aggregate and local Capacity Markets based on total capacity show that the proposed merger would result in HHI increases that exceed the threshold specified in the Guidelines. For each of the approaches to the analysis, the proposed merger would significantly increase concentration in the Capacity Market as defined by the standards of the Guidelines and as defined by these additional metrics and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on those standards and Guidelines.

Mitigation

Assuming that the proposed merger takes place, the MMU performed an analysis to determine what level of mitigation would be required to bring post-merger HHI values to within 100 points of pre-merger values where HHI is less than or equal to 1800, and to within 50 points where HHI values are greater than 1800, consistent with the Guidelines. Mitigation impacts are analyzed for the case where divestiture is to a new company with no capacity resources in PJM and for several cases where divestiture is to a company with existing capacity resources in PJM.

The first case analyzed defines mitigation to mean that the combined company would divest a specified level of capacity to a new company which currently has no capacity resources within PJM.

Table 4-9 shows required mitigation results for the total capacity analysis for both the entire PJM market and the eastern PJM market, following the Guidelines. Required divestiture depends both on the level of HHI prior to the merger and the level of HHI after the merger as the Guidelines specify target maximum increases in HHI that are a function of pre-merger HHI levels. This table assumes, in every case, that divestiture is to a company with no existing capacity in the relevant market. The results of this analysis show that the divestiture of 5,100 MW to a new company with no existing capacity would be required to mitigate the impact of the merger for the entire PJM footprint. Divestiture of 5,500 MW to a new company with no existing capacity would be required to mitigate the impact of the merger for the PJM Mid-Atlantic market. Divestiture of 6,100 MW to a new company with no existing capacity would be required to mitigate the impact of the merger PJM East including imports of 8,000 MW either from one or from five separate companies with no existing capacity. Divestiture of 6,800 MW to a new company with no existing capacity would be required for PJM East if imports are from a single company with existing capacity resources and a market share in the ten to fifteen percent range. Divestiture of 6,100 MW to a new company with no existing

capacity would be required for PJM East if imports are from multiple companies with existing capacity resources and each with a market share less than one percent.

Table 4-10 shows the mitigation results for the locational incremental analysis for PJM East. Depending on the level of existing resources that cleared in the capacity market prior to the binding of the eastern constraint, the divestiture of from 1,000 MW to 3,600 MW to a new company with no existing capacity would be required in order to mitigate the impact of the merger as measured by the Guidelines.

Table 4-11 shows the mitigation results for the total capacity analysis for both the entire PJM market and the eastern PJM market based on the divestiture levels proposed by the merging companies under the assumption that divestiture is to a single company.[30] The divestiture levels proposed by the merging companies and the divestiture levels required under the MMU analysis (from Table 4-9) are shown and compared in Table 4-12. The divestiture levels proposed by the merging companies are consistent with the Guidelines for the Total PJM and for PJM Mid-Atlantic markets under the assumption that divestiture is made to a single company that currently owns no capacity in PJM. The divestiture levels proposed by the merging companies are not consistent with the Guidelines for PJM East or for PJM East with any of the import ownership cases, under the assumption that divestiture is made to a single company that currently owns no capacity in PJM.

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results under two additional scenarios for total capacity for the entire PJM market and PJM East, both based on actual market participant characteristics. The first scenario assumed that the divested capacity is purchased by one existing company which owns capacity in the East and whose market share prior to purchase of divested assets was in the ten to fifteen percent range. The second scenario assumed that the divested capacity is purchased by five existing companies which own capacity in the East and whose individual market shares prior to purchase of divested assets averaged two to three percent. The post-merger HHIs were calculated for each scenario. (See Table 4-13.) In both cases, the divestiture levels from Table 4-9 are evaluated. Those divestiture levels are the levels required to meet the Guidelines under the assumption that divestiture is to a single company with no current capacity ownership in the relevant market.

Table 4-13 shows the post-merger HHI levels that result from the divestiture levels shown in Table 4-9. In Table 4-13 the post-merger HHI levels are calculated for the case where divestiture is to a single company that owns capacity and for the case where divestiture is to five companies that own capacity.

In the case where the divested capacity is purchased by a single existing company with a market share in the ten to fifteen percent range, none of the divestiture levels identified in Table 4-9 for any of the defined markets meet the Guidelines. This includes the Total PJM market and the multiple import ownership cases for the PJM East market. In other words, the post-divestiture increases in HHI are higher than those associated with the base case assumption that the divested assets are purchased by a company with no current market position. The post-merger HHI level for the Total PJM market increased by 204 to 1103, while the post-merger HHI level for all of the PJM East cases with imports increased by over

[30] Divestiture levels proposed by the merging companies are as submitted in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket No. EC05-43-000 dated May 9, 2005.

350. These are the two market definitions for total capacity that are relevant to a determination of competitive market structure.

In the case where the divested capacity is purchased by a single existing company with a market share in the ten to fifteen percent range, it is also the case that the divestiture levels proposed by the merging companies (identified in Table 4-11) do not meet the Guidelines for the Total PJM market and for the PJM East market, regardless of the assumptions about the ownership structure of imports, as shown in Table 4-13. These are the two market definitions for total capacity that are relevant to a determination of competitive market structure.

In the case where the divested capacity is purchased by five existing companies whose individual market shares averaged approximately two to three percent, the divestiture level identified in Table 4-9 does not meet the Guidelines for the Total PJM market, where the post-merger HHI level increased by 110 to 1009, as shown in Table 4-13. However, in the case where the divested capacity is purchased by five existing companies whose individual market shares averaged approximately two to three percent, the divestiture level identified in Table 4-9 does meet the Guidelines for the PJM East market, regardless of the assumptions about the ownership structure of imports, as also shown in Table 4-13. These are the two market definitions for total capacity that are relevant to a determination of competitive market structure.

In the case where the divested capacity is purchased by five existing companies whose individual market shares averaged approximately two to three percent, it is also the case that the divestiture levels proposed by the merging companies (identified in Table 4-11) do meet the Guidelines for the Total PJM market and for the PJM East market, regardless of the assumptions about the ownership structure of imports, as shown in Table 4-13. These are the two market definitions for total capacity that are relevant to a determination of competitive market structure.

A sensitivity analysis was also performed for the locational incremental market for eastern PJM to determine the impact of the characteristics of the purchasing companies on the divestiture levels identified in Table 4-10. In the first case, the divested capacity is purchased by an existing company with a market share in the ten to fifteen percent range. In this case, the divestiture levels identified in Table 4-10 do not meet the Guidelines as shown in Table 4-14. In the second case, the divested capacity is purchased by five existing companies whose individual market shares averaged approximately two to three percent. As also shown in Table 4-14, the divestiture levels identified in Table 4-10 do meet the Guidelines.

The merging companies' proposal to offer capacity at a zero price represents a form of behavioral mitigation that would resolve any identified remaining post-merger market power issue in the capacity market if properly structured. The companies' proposal must be structured so that it would provide the required mitigation for a variety of Capacity Market designs, given the current uncertainty about the ultimate design. If the Capacity Market were restructured so that all participants were required to offer all capacity into the market, the companies' proposal to offer capacity at a zero price would have to be modified to cover all capacity offered to the market by the merging companies.

Table 4-9 PJM Capacity Post-Merger Mitigation as of July 31, 2005

Pre-Merger	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
HHI	899	1110	2132	1782	1390	2227	1393
Highest Market Share							
RSI	0.89	0.81	0.57	0.82	0.82	0.74	0.82
Pivotal Suppliers	1	1	1	1	1	1	1
Post-Merger - 1 New Company							
Mitigation Level (MW)	5,100	5,500	7,200	6,100	6,100	6,800	6,100
HHI	998	1210	2181	1880	1488	2277	1491
Highest Market Share							
New Company Market Share							
RSI	0.85	0.75	0.54	0.75	0.75	0.74	0.75
Pivotal Suppliers	1	1	1	1	1	1	1
Difference							
HHI	99	100	49	98	98	50	98
Highest Market Share	3.7%	5.8%	3.5%	5.8%	5.8%	0.0%	5.7%
RSI	-0.04	-0.06	-0.03	-0.07	-0.07	0.00	-0.07
Pivotal Suppliers	0	0	0	0	0	0	0

Table 4-10 PJM East Capacity Post-Merger Incremental Mitigation as of July 31, 2005

Pre-Merger	75% Incremental	50% Incremental
HHI	1567	1031
Highest Market Share		
RSI	0.72	0.76
Pivotal Suppliers	1	1
Post-Merger - 1 New Company		
Mitigation Level (MW)	3,600	1,000
HHI	1660	1128
Highest Market Share		
New Company Market Share		
RSI	0.65	0.73
Pivotal Suppliers	1	1
Difference		
HHI	93	97
Highest Market Share	6.6%	3.2%
RSI	-0.07	-0.03
Pivotal Suppliers	0	0

Table 4-11 Merging Companies' Proposed PJM Capacity Post-Merger Divestiture as of July 31, 2005

Pre-Merger	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
HHI	899	1110	2132	1782	1390	2227	1393
Highest Market Share							
RSI	0.89	0.81	0.57	0.82	0.82	0.74	0.82
Pivotal Suppliers	1	1	1	1	1	1	1
Post-Merger - 1 New Company							
Mitigation Level (MW)	6,600	6,600	5,500	5,500	5,500	5,500	5,500
HHI	967	1163	2380	1933	1541	2377	1544
Highest Market Share							
New Company Market Share							
RSI	0.86	0.77	0.49	0.73	0.73	0.73	0.73
Pivotal Suppliers	1	1	1	1	1	1	1
Difference							
HHI	68	53	248	151	151	150	151
Highest Market Share	2.8%	3.9%	9.6%	7.5%	7.5%	0.6%	7.5%
RSI	-0.03	-0.04	-0.08	-0.09	-0.09	-0.01	-0.09
Pivotal Suppliers	0	0	0	0	0	0	0

Table 4-12 Comparison of Merging Companies' Proposed Capacity Divestiture and Divestiture from Table 4-9 as of July 31, 2005

	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
Merging Companies' Proposed Divestiture	6,600	6,600	5,500	5,500	5,500	5,500	5,500
Divestiture from Table 4-9	5,100	5,500	7,200	6,100	6,100	6,800	6,100
Difference	1,500	1,100	-1,700	-600	-600	-1,300	-600

Table 4-13 Divestiture Purchaser Sensitivity - Total Capacity as of July 31, 2005

Pre-Merger	Total PJM	PJM Mid-Atlantic	PJM East	PJM East New Single 8,000 MW Import	PJM East New Multiple 8,000 MW Import	PJM East Existing Single 8,000 MW Import	PJM East Existing Multiple 8,000 MW Import
HHI	899	1110	2132	1782	1390	2227	1393
Highest Market Share	[redacted]						
RSI	0.89	0.81	0.57	0.82	0.82	0.74	0.82
Pivotal Suppliers	1	1	1	1	1	1	1
Post-Merger - 1 Existing Company							
Mitigation Level (MW) (From Table 4-9)	5,100	5,500	7,200	6,100	6,100	6,800	6,100
HHI	1103	1481	2841	2219	1827	3488	1830
Highest Market Share	[redacted]						
RSI	0.85	0.75	0.52	0.75	0.75	0.53	0.75
Pivotal Suppliers	1	1	1	1	1	1	1
Difference from Pre-Merger HHI	204	371	709	437	437	1261	437
Merging Companies' Proposal - 1 Existing Company							
Divestiture Level (MW) (From Table 4-11)	6,600	6,600	5,500	5,500	5,500	5,500	5,500
HHI	1102	1489	2884	2239	1846	3357	1849
Highest Market Share	[redacted]						
RSI	0.85	0.73	0.49	0.73	0.73	0.57	0.73
Pivotal Suppliers	1	1	1	1	1	1	1
Difference from Pre-Merger HHI	203	379	752	457	456	1130	456
Post-Merger - 5 Existing Companies							
Mitigation Level (MW) (From Table 4-9)	5,100	5,500	7,200	6,100	6,100	6,800	6,100
HHI	1009	1198	1798	1725	1333	2075	1336
Highest Market Share	[redacted]						
RSI	0.85	0.75	0.54	0.75	0.75	0.74	0.75
Pivotal Suppliers	1	1	1	1	1	1	1
Difference from Pre-Merger HHI	110	88	-334	-57	-57	-152	-57
Merging Companies' Proposal - 5 Existing Companies							
Divestiture Level (MW) (From Table 4-11)	6,600	6,600	5,500	5,500	5,500	5,500	5,500
HHI	964	1133	2182	1813	1421	2258	1424
Highest Market Share	[redacted]						
RSI	0.86	0.77	0.49	0.73	0.73	0.73	0.73
Pivotal Suppliers	1	1	1	1	1	1	1
Difference from Pre-Merger HHI	65	23	50	31	31	31	31

Table 4-14 Divestiture Purchaser Sensitivity - Incremental Capacity as of July 31, 2005

Pre-Merger	75% Incremental	50% Incremental
HHI	1567	1031
Highest Market Share	[redacted]	
RSI	0.72	0.76
Pivotal Suppliers	1	1
Post-Merger - 1 Existing Company		
Mitigation Level (MW)	3,600	1,000
HHI	2250	1396
Highest Market Share	[redacted]	
RSI	0.62	0.69
Pivotal Suppliers	1	1
Difference from Pre-Merger HHI	683	365
Post-Merger - 5 Existing Companies		
Mitigation Level (MW)	3,600	1,000
HHI	1496	1128
Highest Market Share	[redacted]	
RSI	0.65	0.73
Pivotal Suppliers	1	1
Difference from Pre-Merger HHI	-71	97

5. Regulation Market

Methods of Analysis

The merger analysis focuses on the Mid-Atlantic Regulation Market as the regulation market most likely to be impacted by the merger. The analysis of the competitiveness of the PJM Mid-Atlantic Regulation Market before and after the proposed merger of PSEG and Exelon in this Part Two of the report is based on regulation market data for the period from May 1, 2005 through July 31, 2005. The pre-merger analysis reflects actual market results during this period and the post-merger data analysis modifies the actual results only to reflect the new ownership of assets by the combined company. The actual market results for the Mid-Atlantic Regulation Market are unaffected by the integrations as the integrations added regulation capability solely to the PJM Western Region Regulation Market.

Effective August 1, 2005, PJM combined the Mid-Atlantic and Western Region Regulation areas into a single market on a trial basis. A decision will be made whether to retain this combined structure based on the MMU's assessment of the competitiveness of the combined market during its first six months. This report is based on the market structure as it existed for the May 1 though July 31, 2005 period.

Basic measures of market structure are examined including market shares, HHI and RSI.

The provision of the regulation ancillary service, defined by FERC in Order No. 888,[31] is coordinated by PJM. NERC requires that PJM maintain regulating capability in order to match short-term deviations in system load. Regulation refers to the PJM control action that is performed to correct for load changes that may cause the power system to operate above or below 60 Hz.[32] The generating resources assigned to meet the PJM Regulation Requirement must be capable of responding to the Area Regulation ("AR") signal within five minutes and must increase or decrease their outputs at the Ramping Capability rates that are specified in the Offer Data that is submitted to PJM.[33] The regulation service supplied by individual generating units is: "[t]he capability of a specific generating unit with appropriate telecommunications, control and response capability to increase or decrease its output in response to a regulating control signal."[34]

A Regulation Zone is defined as any of those one or more geographic areas, each consisting of a combination of one or more Control Zone(s) as designated by the Office of the Interconnection in the PJM Manuals, relevant to the provision of and requirement for, regulation service.[35] Regulation for each Regulation Zone shall be supplied from generators located within the metered electrical boundaries of such Regulation Zone.[36] Thus, the largest relevant geographic market for regulation service in the PJM Mid-Atlantic Regulation Market

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31 Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, Order No. 888, 1991-1996 FERC Stats. & Regs., Regs. Preambles ¶ 31,036 (1996), order on reh'g, Order No. 888-A, 1996-2000 FERC Stats. & Regs., Regs. Preambles ¶ 31,048, order on reh'g, Order No. 888-B, 81 FERC ¶ 61,248 (1997), reh'g denied, Order No. 888-C, 82 FERC 61,046 (1998), aff'd in part and remanded in part sub nom. Transmission Access Policy Study Group v. FERC, 225 F.3d 667 (D.C. Cir. 2000), aff'd sub nom. New York v. FERC, 535 U.S. 1 (2002).

32 See "PJM Manual 10: Pre-Scheduling Operations," p. 25.
33 See "PJM Manual 10: Pre-Scheduling Operations," p. 26.
34 See "PJM Manual 35: Definitions and Acronyms," p. 54.
35 See "PJM Operating Agreement," Section 1.38A.
36 See "PJM Operating Agreement," Section 1.7.18 (a).

is that entire regulation zone. Imports of regulation are not possible. Suppliers in the relevant geographic market include all companies which own generating capacity in the market that have the required capability to provide regulation and pass PJM tests for regulation.

The provision of regulation in the Mid-Atlantic Regulation Market constitutes a separate market as there are no good substitutes for the regulation product in the PJM Mid-Atlantic Regulation Market.

The supply of regulation can be measured as regulation capability, regulation offered, regulation offered and eligible or regulation assigned.

- Regulation capability represents the total volume of regulation capability reported by resource owners based on unit characteristics. Regulation capability represents the absolute maximum level of regulation and exceeds the expected level of regulation offers for a variety of reasons discussed below.[37]

- Regulation offered represents the level of regulation capability actually offered to the PJM Regulation Market. Resource owners may offer those units with approved regulation capability into the PJM Regulation Market. PJM does not require a resource capable of providing regulation service to offer its capability to the market. Regulation offers may be submitted on a daily basis and these daily offers may be modified on an hourly basis. It is possible to offer regulation for a day but to subsequently make that capability unavailable for any number of hours, including all hours of the day.

- Regulation offered and eligible represents the level of regulation capability actually offered to the PJM Regulation Market and actually eligible to provide regulation in an hour. Some regulation offered to the market is not eligible to participate in the regulation market as a result of identifiable offer parameters specified by the supplier. As an example, the regulation capability of a unit will be included in regulation offered based on the daily offer and availability status, but that regulation capability will not be eligible in one or more hours because the supplier sets the availability status to unavailable for one or more hours of that same day. (The availability status of a unit may be set in both a daily offer and an hourly update table in the PJM market software.) As another example, the regulation capability of a unit will be included in regulation offered if the owner of a unit offers regulation, but that regulation capability will not be eligible if the owner sets the unit's economic maximum generation level equal to its economic minimum generation level. In that case, the unit cannot provide regulation and is not eligible to provide regulation. As another example, the regulation capability of a unit will be included in regulation offered but that regulation capability will not be eligible if the unit is not operating, unless the unit is a combustion turbine that meets specific operating parameter requirements, including start time.

  Only those offers which are eligible to provide regulation in an hour are part of supply for that hour, and only those offers actually are considered by PJM for purposes of clearing the market. Regulation offered and eligible constitute the full extent of the market in an hour and are, therefore, the appropriate market offers for the application of market structure tests.

[37] The extent and height of barriers to entry into the regulation market are also relevant in considering the competitiveness of the market.

- Regulation assigned represents those regulation resources selected through the regulation market-clearing mechanism to provide regulation service for a given hour.

Available market data across all PJM regulation markets, both market-based and cost-based, indicates that from 53 percent to 55 percent of submitted capability is actually offered into the regulation market on an hourly basis while from 44 percent to 49 percent of submitted capability is offered and eligible. This result does not imply that withholding is occurring. There are many legitimate reasons why regulation capability is not offered into the regulation markets on an hourly basis including whether a unit is on line, how a unit's operating parameters are set, whether a combustion turbine ("CT") has a start time permitting it to participate in the next hour and a variety of other factors. The level of actual offers also does not imply anything about reliability. With some exceptions in the Western Region Regulation Market following the integration of Dominion, PJM has always had adequate regulation resources available to meet the regulation requirements.

For Part Two of this report, the three months of available market data for the PJM Mid-Atlantic Regulation Market was analyzed for the period May 1, 2005 through July 31, 2005.

The market power analysis follows the Commission logic specified in the AEP Order.[38] The MMU follows the logic of the delivered price test by calculating market share, HHI and pivotal supplier metrics for each market configuration. The analysis presented here differs in two ways from the Commission's delivered price test. The analysis here includes all regulation capability offered into the market without regard to cost. The delivered price test would start with the universe of regulation offered and eligible and then limit the analysis to those units that could offer regulation at less than or equal to 1.05 times the clearing price. In addition, the analysis here includes all regulation offered by each supplier while the delivered price test uses the gross supply by participant net of their load obligation. The fact that suppliers have load obligations does affect their incentives to exercise market power.

The Commission's AEP Order indicates that failure of any one of the specified tests is adequate for a showing of market power. The analysis presented here goes one step further in order to analyze the significance of excess supply. If the market fails either or both of the market share test or the HHI test in the presence of excess supply, the MMU applies the three pivotal supplier test. The analysis here uses the three pivotal supplier test as a specific threshold in the presence of excess supply. The three pivotal supplier test permits an explicit evaluation of whether available excess supply offsets market power concerns associated with market share and market concentration results. If the three pivotal supplier test is passed, the available suppliers could meet the demand for regulation without the three dominant suppliers and the market would be deemed competitive. The three pivotal supplier test is used here only to determine if there is evidence to mitigate the results of the market share and market concentration analyses.

The three pivotal supplier test represents an analytical approach to the issue of excess supply. Excess supply, by itself, is not necessarily adequate to ensure a competitive outcome. A monopolist could have substantial excess supply but the monopolist would not be expected to change its market behavior as a result. The same logic applies to a small group of dominant suppliers. However, if there is adequate supply without the three dominant suppliers to meet the demand, then the market can reasonably be deemed competitive.

[38] AEP Power Mktg. Inc., 107 FERC ¶ 61,018 ("AEP Order"), order on reh'g, 108 FERC ¶ 61,026 (2004).

Pre-Merger Market Conditions

The pre-merger analysis is based on actual regulation market data for the period from May 1 through July 31, 2005.

Excess supply, defined as the ratio of the hourly regulation offered to the hourly regulation requirement, averaged 2.61. Excess supply, defined as the ratio of the hourly offered and eligible regulation to the regulation requirement, averaged 1.86. The average regulation requirement for the PJM Mid-Atlantic Regulation Market was 445 MW during this three-month period. The regulation requirement ranged from a minimum of 226 MW to a maximum of 649 MW during the three-month period ended July 31, 2005.

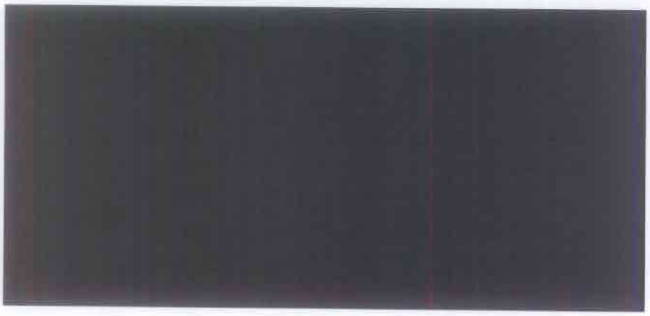
Hourly HHI values were calculated based upon the regulation offered, regulation offered and eligible, and regulation assigned. Based upon regulation offered, HHI ranged from a maximum of 2035 to a minimum of 1090 with an average value of 1477. Based upon regulation offered and eligible, HHI values ranged from a maximum of 2533 to a minimum of 1282, with an average of 1779. For regulation offered and eligible, the HHI was at or above 2500 less than one percent of the studied hours. Based upon regulation assigned, HHI values ranged from a maximum of 5918 to a minimum of 1124. The average HHI value for regulation assigned was 2087. For regulation assigned, the HHI was at or above 2500 during 17 percent of the studied hours. Table 5-1 summarizes the HHI results.

Table 5-1 PJM Hourly Regulation Market Pre-Merger HHI: May 1, 2005 through July 31, 2005

	Minimum	Average	Maximum
Offered	1090	1477	2035
Eligible	1282	1779	2533
Assigned	1124	2087	5918

There was one supplier with a market share in excess of 20 percent for offered supply. The largest market share for offered regulation was held by [redacted] with [redacted] The second largest market share for offered supply was held by [redacted] The third largest market share for offered supply was held [redacted] had [redacted] of the offered regulation market share. There were two suppliers with market shares in excess of 20 percent for regulation offered and eligible. The largest market share for regulation offered and eligible was held by [redacted] with [redacted] The second largest market share for regulation offered and eligible was held by [redacted] The third largest market share for regulation offered and eligible was held by [redacted] had market shares for regulation offered and eligible of [redacted]. No suppliers held market shares in excess of 20 percent for regulation assigned. The largest market share for regulation assigned was held by [redacted] with [redacted] The second largest market share for regulation assigned was held by [redacted] with [redacted] The third largest market share for regulation assigned was held by [redacted] had a [redacted] market share for regulation assigned. Table 5-2 summarizes the market share results.

Table 5-2 PJM Hourly Regulation Market Pre-Merger market shares: May 1, 2005 through July 31, 2005



In the PJM Mid-Atlantic Regulation Market none of the hours failed the single pivotal supplier test for offered supply. This means that during the three-month period total demand could be met in the absence of the largest single supplier in the market. For offered regulation, 3 percent of the hours failed the two pivotal supplier test for offered supply. This means that during 3 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For offered regulation, 32 percent of the hours failed the three pivotal supplier test for offered supply. This means that during 32 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market.

For regulation offered and eligible, 14 percent of the hours failed the single pivotal supplier test. This means that during 14 percent of the hours, total demand could not be met in the absence of the largest single supplier in the market. For regulation offered and eligible, 63 percent of the hours failed the two pivotal supplier test. This means that during 63 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For regulation offered and eligible, 97 percent of the hours failed the three pivotal supplier test. This means that during 97 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market. Table 5-3 summarizes the pivotal supplier results.

Table 5-3 PJM Hourly Regulation Market Pre-Merger pivotal supplier results: May 1, 2005 through July 31, 2005

	Percent of Hours Offered	Percent of Hours Eligible
1-pivotal	0%	14%
2-pivotal	3%	63%
3-pivotal	32%	97%

Post-Merger Market Conditions

The post-merger analysis is based on actual regulation market data for the period from May 1, 2005 through July 31, 2005 modified to combine the ownership of PSEG and Exelon resources into a single company.

The excess supply results do not change as a result of the merger.

Changes in hourly HHI values were calculated based upon the regulation offered, regulation offered and eligible, and regulation assigned. Based upon regulation offered, HHI values

increased by 202 from 2035 to 2237 for the maximum, by 198 from 1090 to 1288 for the minimum and by 168 from 1477 to 1645 for the average. Based upon regulation offered, the number of hours that the HHI was above 2500 increased by less than one percent. Based upon regulation offered and eligible, HHI values increased by 185 from 2533 to 2718 for the maximum, by 126 from 1282 to 1408 for the minimum and by 124 from 1779 to 1903 for the average. Based upon regulation offered and eligible, the number of hours that the HHI was above 2500 increased by less than one percent. Based upon regulation assigned, HHI values were unchanged at 5918 for the maximum, increased by 156 from 1124 to 1280 for the minimum and increased by 393 from 2087 to 2480 for the average. Based upon regulation assigned, the number of hours that the HHI was above 2500 increased by ten percentage points. Table 5-4 summarizes post-merger HHIs. Table 5-5 summarizes the changes in HHI for post-merger versus pre-merger conditions.

Table 5-4 PJM Hourly Regulation Market post-merger HHI : May 1, 2005 through July 31, 2005

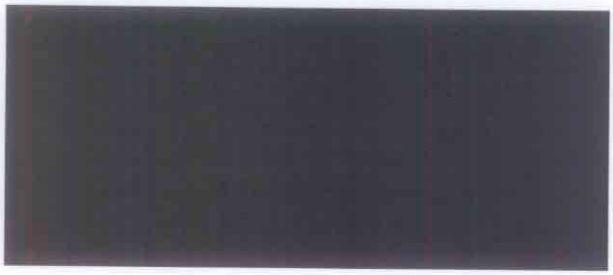
	Minimum	Average	Maximum
Offered	1288	1645	2237
Eligible	1408	1903	2718
Assigned	1280	2480	5918

Table 5-5 PJM Hourly Regulation Market Post-Merger HHI Increases: May 1, 2005 through Jul 31, 2005.

	Minimum	Average	Maximum
Offered	198	168	202
Eligible	126	124	185
Assigned	156	393	0

There were two suppliers with market shares in excess of 20 percent for offered supply on a post-merger basis. The largest market share for offered regulation was held by [redacted] with a market share of [redacted] for offered supply. [redacted] held the second largest market share of [redacted] for offered supply. The third largest market share for offered supply was held by [redacted]. There were two suppliers with market shares in excess of 20 percent for offered and eligible. [redacted] was the largest supplier with a market share of [redacted] for regulation offered and eligible. [redacted] was the second largest supplier for regulation offered and eligible with a [redacted] market share. The third largest market share for regulation offered and eligible was held by [redacted] with [redacted] There was one supplier with a market share in excess of 20 percent for regulation assigned. [redacted] was the largest supplier for regulation assigned with a [redacted] market share. The second largest market share for regulation assigned was held by [redacted] with [redacted]. The third largest market share for regulation assigned was held by [redacted] with [redacted]. Table 5-6 summarizes the post-merger market shares.

Table 5-6 PJM Hourly Regulation Market Post-Merger Market Shares: May 1, 2005 through July 31, 2005



In the PJM Mid-Atlantic Regulation Market, none of the hours failed the single pivotal supplier test for offered supply on a post-merger basis. This means that total demand could be met in the absence of the largest single supplier in the market. For offered regulation, 6 percent of the hours failed the two pivotal supplier test. This means that during 6 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For offered regulation, 64 percent of the hours failed the three pivotal supplier test. This means that during 64 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market.

For regulation offered and eligible, 21 percent of the hours failed the single pivotal supplier test on a post-merger basis. This means that during 21 percent of the hours, total demand could not be met in the absence of the largest single supplier in the market. For regulation offered and eligible, 69 percent of the hours failed the two pivotal supplier test. This means that during 69 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For regulation offered and eligible, 98 percent of the hours failed the three pivotal supplier test. This means that during 98 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market. Table 5-7 summarizes the post-merger pivotal supplier results.

Table 5-7 PJM Hourly Regulation Market Post-Merger Pivotal Supplier Results: May 1, 2005 through July 31, 2005

	Percent of Hours Offered	Percent of Hours Eligible
1-pivotal	0%	21%
2-pivotal	6%	69%
3-pivotal	64%	98%

Changes in pivotal supplier results were calculated based upon the regulation offered and regulation offered and eligible. Based upon regulation offered, single pivotal supplier results were unchanged at zero percent of the total hours. Based upon regulation offered, the percent of hours during which the two-pivotal supplier test is failed increased 3 percentage points to 6 percent of the total hours. Based upon regulation offered, the percent of hours during which the three-pivotal supplier test is failed increased 32 percentage points to 64 percent of the total hours.

Based upon regulation offered and eligible, the percent of hours during which the one-pivotal supplier test is failed increased by seven percentage points to 21 percent of the total hours. Based upon regulation offered and eligible, the percent of hours during which the two-pivotal supplier test is failed increased by six percentage points to 69 percent of the total hours. Based upon regulation offered and eligible, the percent of hours during which the three-pivotal supplier test is failed increased by one percentage points to 98 percent of the total hours. Table 5-8 summarizes the changes in pivotal supplier results for post-merger versus pre-merger conditions.

Table 5-8 PJM Hourly Regulation Market post merger pivotal supplier differences: May 1, 2005 through July 31, 2005

	Percent of Hours Offered	Percent of Hours Eligible
1-pivotal	0%	7%
2-pivotal	3%	6%
3-pivotal	32%	1%

Conclusions

The analysis of the regulation market shows that the proposed merger results in an increase in HHI for offered and eligible regulation. That increase raises the HHI from the moderately concentrated level of 1779 to the highly concentrated level of 1903. The proposed merger would significantly increase concentration in the regulation market as defined by the standards of the Guidelines and therefore raises concerns about potential adverse competitive effects, absent mitigation. These results should be interpreted based on those standards and Guidelines. This conclusion is based on the increase of 124 in average HHI for offered and eligible regulation from an average of 1779 to an average of 1903.

Mitigation

Mitigation of the merger impacts could be provided by an application of existing PJM market rules to the PJM Mid-Atlantic Regulation Market. This market could be made a cost-based market, as the PJM West Regulation Market and the PJM spinning markets are currently. As an alternative, the merged company could agree to offer its regulation capability into the market at cost-based levels. Finally, divestiture of regulation ownership could be designed in order to reverse the consequences of the merger for competitive conditions in the Mid-Atlantic Regulation Market.

The MMU evaluated the mitigation proposal of Exelon. The regulation capability of the units identified as candidate facilities for divestiture as listed in the Answer of Exelon Corporation and Public Service Enterprise Group, Inc. in Docket # EC05-43-000 dated May 9, 2005 was compiled. For the PJM Mid-Atlantic Regulation Market, there was sufficient regulation capability available within the list of candidate facilities to return the post-merger HHI to pre-merger levels for offered and eligible regulation. However, critical caveats are that effective mitigation is, and can only be, based on specific units and based on specific purchasers. The regulation capability available to resolve the structural issues resulting from the proposed merger is unit specific. It is not possible to evaluate a proposed divestiture of installed capacity without an exact specification of the units. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the identification of specific

units. Similarly, the characteristics of the purchaser or purchasers of divested assets must be known in order to make a meaningful assessment of the effectiveness of a proposed unit-specific divestiture in remedying structural market problems resulting from the proposed merger. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. Given that the pre-merger level of HHI can be achieved for offered and eligible regulation, any intermediate post-merger level of HHI can also be achieved, with the same caveats.

Divestiture

Analysis was performed to determine the PSEG/Exelon divestiture requirement to return the PJM Mid-Atlantic Regulation Market to the pre-merger structural conditions.

In the May-July 2005 Regulation Market in the PJM Mid-Atlantic Region, the offer capability was 1,945 MW with an average hourly eligible offer level of 761 MW. Capability is the maximum amount of regulation that was offered to the market from the designated units. On average therefore, approximately 39 percent of the stated capability of regulation resources was offered and eligible to participate in the PJM Mid-Atlantic Regulation Market on an hourly basis.

It was determined that a divestiture of [redacted] of hourly eligible regulation supply, or [redacted] of capability, by the PSEG/Exelon merged company to a single firm with no existing regulation assets in the Mid-Atlantic regulation market would return the structural conditions to near the pre-merger conditions. This divestiture assumes that the total supply of regulation remains constant. The average hourly total volume of regulation offered was 1,142 MW, with a minimum value of 578 MW and a maximum value of 1,945 MW. [redacted] The average hourly total volume of regulation offered and eligible was 761 MW, with a minimum value of 272 MW and a maximum value of 1,316 MW. [redacted]

The analysis assumes that the divested MW were transferred to a single firm currently having no position in the PJM Mid-Atlantic Regulation Market. The analysis was conducted by removing all of the units on the list of units proposed for divestiture in Docket # EC05-43-000 of offered and eligible supply each hour from the combined company during the three month period and assigning them to a hypothetical new firm having zero MW of regulation prior to the divestiture. The average value of offered and eligible regulation associated with the divested units is [redacted]. Market shares, HHI and pivotal supplier results were then recalculated for each hour of the three-month period and compared to the pre-merger structural conditions.

The post-divestiture analysis, like the pre-divestiture analysis, is based on actual regulation market data for the three months ended July 31, 2005 modified to combine the ownership of PSEG and Exelon resources into a single company.

Hourly HHI values were calculated based upon the regulation offered and regulation offered and eligible. Based upon regulation offered, post-merger, post-divestiture HHI values ranged from a maximum of 2028 to a minimum of 1095 with an average value of 1475. Based upon regulation offered and eligible, post-merger, post-divestiture HHI values ranged from a maximum of 2546 to a minimum of 1259, with an average of 1766. For regulation offered and eligible, the HHI was at or above 2500 less than one percent of the studied hours. Table 5-9 and Table 5-10 summarize the HHI results for post-merger conditions assuming a divestiture of units specified in #EC05-43-000. Note that a negative number in Table 5-10 indicates a decrease in the HHI level.

Table 5-9 PJM Hourly Regulation Market post-merger with divestiture HHI; May 1, 2005 through July 31, 2005

	Minimum	Average	Maximum
Offered	1095	1475	2028
Eligible	1259	1766	2546

Table 5-10 PJM Hourly Regulation Market post-merger with divestiture HHI differences from pre-merger case: May 1, 2005 through July 31, 2005

	Minimum	Average	Maximum
Offered	5	-2	-7
Eligible	-23	-13	13

On a post-merger, post-divestiture basis, there was one supplier with a market share in excess of 20 percent for offered supply. The largest market share for offered regulation was [redacted] with [redacted]. The second largest market share for offered supply was [redacted] with [redacted] The third largest market share for offered supply was the [redacted] with [redacted] had a market share of [redacted] for regulation offered. There was one supplier with a market share in excess of 20 percent for regulation offered and eligible. The largest market shares for regulation offered and eligible was [redacted] with [redacted] The second largest market share for regulation offered and eligible was [redacted] with [redacted]. The third largest market share for regulation offered and eligible was [redacted] with [redacted] The [redacted] had a market share of [redacted] for regulation offered and eligible. [redacted] had a market share of [redacted] for regulation offered and eligible. Table 5-11 summarizes the market share results for post-merger conditions assuming a divestiture of all the units specified in #EC05-43-000. .

Table 5-11 PJM Hourly Regulation Market post-merger with divestiture market shares: May 1, 2005 through July 31, 2005

[redacted]

On a post-merger, post-divestiture basis, in the PJM Mid-Atlantic Regulation Market, zero percent of the hours failed the single pivotal supplier test for offered supply. This means that during the three month study period total demand could always be met in the absence of the largest single supplier in the market. For offered regulation, 5 percent of the hours failed the two pivotal supplier test for offered supply. This means that during 5 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For offered regulation, 43 percent of the hours failed the three pivotal supplier test for offered supply. This means that during 43 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market.

For regulation offered and eligible, 20 percent of the hours failed the single pivotal supplier test. This means that during 20 percent of the hours, total demand could not be met in the absence of the largest single supplier in the market. For regulation offered and eligible, 68 percent of the hours failed the two pivotal supplier test. This means that during 68 percent of the hours, total demand could not be met in the absence of the two largest suppliers in the market. For regulation offered and eligible, 97 percent of the hours failed the three pivotal supplier test. This means that during 97 percent of the hours, total demand could not be met in the absence of the three largest suppliers in the market.

Table 5-12 and Table 5-13 summarize the pivotal supplier results for post-merger conditions assuming an offered and eligible supply divestiture of all units specified in #EC05-43-000.

Table 5-12 PJM Hourly Regulation Market post-merger with divestiture pivotal supplier results: May 1, 2005 through July 31, 2005

	Percent of Hours Offered	Percent of Hours Eligible
1-pivotal	0%	20%
2-pivotal	5%	68%
3-pivotal	43%	97%

Table 5-13 PJM Hourly Regulation Market post-merger with divestiture pivotal supplier differences from pre-merger case: May 1, 2005 through July 31, 2005

	Percent of Hours Offered	Percent of Hours Eligible
1-pivotal	0%	6%
2-pivotal	2%	5%
3-pivotal	11%	0%

In summary, the MMU analysis shows that divestiture of units specified in #EC05-43-000 to a single firm with no existing regulation assets would result in post-merger HHI levels slightly less than pre-merger HHI levels for eligible regulation and post-merger three pivotal supplier results that showed a small increase over the pre-merger three pivotal supplier results.

The MMU analysis also shows that divestiture of [redacted] of the merged company's average offered [redacted] or eligible [redacted] regulation supply would result in a post-merger HHI increase of just under 100 points. These details are presented in Table 5-14 which shows the level of eligible regulation and the corresponding level of

regulation capability divestiture required to return the post-merger HHI and RSI to the pre-merger levels. A divestiture target is also presented to return the post-merger HHI to within 100 points of the pre-merger level. These results assume that divestiture is made to a single company with no existing regulation capability.

Table 5-14 PJM Hourly Regulation Market divestiture targets

	Regulation MW	
Target	Offer	Eligible
Pre-merger HHI		
Guidelines		

In order to evaluate the sensitivity of the post-merger results to the characteristics of the companies purchasing the divested assets, the MMU calculated the HHI results for offered and eligible regulation under three additional scenarios. The first scenario assumed that the divested regulation is purchased by one existing company whose market share was close to five percent (5.1 percent). The second scenario assumed that the divested capacity is purchased by an existing company whose market share is close to 9 percent (9.4 percent). The third scenario assumed that the divested capacity was purchased by an existing company whose market share was 24 percent. The post-merger HHIs were calculated for each scenario. (See Table 5-15)

For the scenario in which the divested regulation is purchased by an existing company with a market share of 5 percent, the post-merger HHI value is 54 points above the pre-merger value. This increase in the HHI level is less than the level specified in the Guidelines.

For the scenario in which the divested regulation is purchased by an existing company with a market share of 9 percent, the post-merger HHI value is 160 points above the pre-merger value. This increase in the HHI level is greater than the level specified in the Guidelines.

For the scenario in which the divested regulation is purchased by an existing company with a market share of 24 percent, the post-merger HHI value is 397 points above the pre-merger value. This increase in the HHI level is greater than the level specified in the Guidelines.

Table 5-15 PJM Hourly Regulation Market post-merger with divestiture HHI differences from pre-merger case for offered and eligible supply: May 1, 2005 through July 31, 2005

Purchasing Company Pre-merger Market Share	Minimum	Average	Maximum
0%	-23	-13	13
5%	134	54	13
9%	118	160	257
24%	163	397	764

6. Spinning Reserves Market

Method of Analysis

The merger analysis focuses on the Mid-Atlantic Spinning Market as the spinning reserves market most likely to be impacted by the merger. The basic measures of market structure are examined including market shares and HHI. This market is not structurally competitive under current circumstances. The merger has no significant impact on the structure of the spinning reserve market.

The results are based on an analysis of the competitiveness of the PJM Mid-Atlantic Spinning Market before and after the proposed merger of PSEG and Exelon based on 12 months of actual spinning market data through July 31, 2005. The pre-merger data reflects actual market results during this period and the post-merger data combines the ownership of PSEG and Exelon from the actual market results.

Spinning reserve is an ancillary service defined as generation that is synchronized to the system and capable of producing output within 10 minutes. Spinning reserve can, at present, be provided by a number of sources, including steam units with available ramp, condensing hydroelectric units, condensing CTs and CTs running at minimum generation.

All of the units that participate in the Spinning Reserve Market are categorized as either Tier 1 or Tier 2 spinning. Tier 1 resources are those units that are online following economic dispatch and able to respond to a spinning event by ramping up from their present output. All units operating on the PJM system are considered potential Tier 1 resources, except for those explicitly assigned to Tier 2 spinning. Tier 2 resources include units that are backed down to provide spinning capability and condensing units synchronized to the system and available to increase output.

PJM introduced a market for spinning reserve on December 1, 2002. Before the Spinning Reserve Market, Tier 1 spinning reserve had not been compensated directly and Tier 2 spinning reserve had been compensated on a unit-specific, cost-based formula.

Under the Spinning Reserve Market rules, Tier 1 resources are paid when they respond to an identified spinning event as an incentive to respond when needed. Tier 1 spinning payments or credits are equal to the integrated increase in MW output above economic dispatch from each generator over the length of a spinning event, multiplied by the spinning energy premium less the hourly integrated LMP. The spinning energy premium is defined as the average of the five-minute LMPs calculated during the spinning event plus $50 per MWh.[39] All units called on to supply Tier 1 or Tier 2 spinning have their actual MW monitored. Tier 1 units are not penalized if their output fails to match their expected response as they are only compensated for their actual response. Tier 2 units assigned spinning by market operations are compensated whether or not they are actually called on to supply spinning so they are penalized if their MW output fails to meet their assignment.

Tier 2 spinning requirements are determined by subtracting the amount of Tier 1 spinning available from the total control area spinning reserve requirement for the period.

Under the Spinning Reserve Market rules, Tier 2 spinning resources are paid in order to be available as spinning reserve, regardless of whether the units are called upon to generate in

[39] See "PJM Manual 11: Scheduling Operations," Revision 23 (December 7, 2004), pp. 66-67.

response to a spinning event. The price for Tier 2 spinning resources is determined in a market for Tier 2 spinning resources. Several steps are necessary before the hourly Tier 2 Spinning Reserve Market is cleared. Ninety minutes prior to the start of the hour, PJM estimates the amount of Tier 1 reserve available from every unit; 60 minutes prior to the start of the hour, self-scheduled Tier 2 units are identified. If spinning requirements are not met by Tier 1 and self-scheduled Tier 2 resources, then a Tier 2 clearing price is determined 30 minutes prior to the start of the hour. This Tier 2 price is equivalent to the merit order price of the highest price, Tier 2 resource needed to fulfill spinning requirements, the marginal unit. A unit's merit order price is a combination of the unit's spinning offer price, the cost of energy use per MWh of capability and the unit's opportunity cost.[40]

The spinning offer price submitted for a unit can be no greater than the maximum value of the unit's operating and maintenance cost plus a $7.50 per MWh margin.[41, 42] The market-clearing price is comprised of the marginal unit's offer price, cost of energy use and opportunity cost. All units cleared in the Spinning Reserve Market are paid the higher of either the market-clearing price or the unit's spinning offer plus the unit-specific LOC and cost of energy use incurred. The Mid-Atlantic Region's Tier 2 Spinning Reserve Market is cleared on cost-based offers because the structural conditions for competition do not exist. The structural issue can be more severe when the Spinning Reserve Market becomes locational because of transmission constraints.[43]

For this report, the twelve months of available market data for the PJM Mid-Atlantic Spinning Market was analyzed for the period August 1, 2004 through July 31, 2005.

The MMU calculates market share and HHI metrics for the spinning reserve market for each hour. The analysis presented here focuses on actual market clearing results.

Table 6-1 PSEG / Exelon Merger Analysis, Tier 2 Spinning Reserve Market, August 1, 2004 - July 31, 2005

	Minimum	Average	Maximum
Offered	2079	4603	10000
Eligible	2079	4617	10000
Delta	0	14	0

Pre-Merger Market Conditions

The pre-merger analysis is based on actual Tier 2 spinning reserve market data for the twelve months ended July 31, 2005. This period is a reasonable representation of the Tier 2

40 Although it is unusual, a PJM dispatcher can deselect units which have been committed after the clearing price is established. This only happens if real-time system conditions require dispatch of a spinning unit for constraint control, or problems with a generator or monitoring equipment are reported.

41 See "PJM Manual 11: Scheduling Operations," Revision 25 (August 19, 2005), p. 58.

42 See PJM Manual 15: Cost Development Guidelines, Rev. 4, (September 1, 2004), p. 31.

43 PJM Mid-Atlantic spinning assignments are bifurcated in the presence of significant west-east constraints. PJM assigns spin to the Mid-Atlantic region via east and west sub-region components to account for the limited ability to deliver western energy to eastern load during congestion. With the merger of two of the largest eastern sub-region firms, this sub-market would become more concentrated during times of congestion.

spinning reserve market as the Mid-Atlantic Spinning Reserve market was not affected by the integrations that occurred in 2004 and 2005.

HHI ranged from a maximum of 10000 to a minimum of 2079 with an average value of 4603. Table 6-1 summarizes the HHI results.

There were three suppliers with a market share in excess of 20 percent for spinning reserve cleared in the market. The largest market share for spinning reserve was held by [redacted] with [redacted]. The second largest market share for spinning reserve was held by [redacted] with [redacted]. The third largest market share for spinning reserve was [redacted] with [redacted]. [redacted] had a [redacted] market share.

Table 6-2 Pre-Merger Market Shares, Tier 2 Spinning Reserve Market, August 1, 2004 – July 31, 2005

[redacted]

Post-Merger Market Conditions

The post-merger analysis is based on actual Tier 2 spinning reserve market data for the twelve months ended July 31, 2005 modified to combine the ownership of PSEG and Exelon resources into a single company.

Hourly HHI values were calculated based upon spinning reserve cleared in the market. HHI ranged from a maximum of 10000 to a minimum of 2079 with an average value of 4617.

The market share results were not significantly affected by the proposed merger.

Table 6-3 Post-Merger Market Shares, Tier 2 Spinning Reserve Market, August 1, 2004 – July 31, 2005

[redacted]

The MMU concludes, based on the above analysis that the merger will not have a significant impact on the competitiveness of the PJM Mid-Atlantic Tier 2 Spinning Reserve Market. This conclusion is based on the increase of 14 points in average HHI for the spinning reserve market from an average of 4603 to an average of 4617. [redacted]

Conclusion

The analysis of the spinning reserve market shows that the proposed merger results in an increase in HHI that is less than the threshold increase specified in the Guidelines. The proposed merger would not significantly increase concentration in the spinning reserve market as defined by these metrics and the standards of the Guidelines and therefore there are no concerns about potential adverse competitive effects. These results should be interpreted based on those standards and Guidelines.