STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-22, SUB 418

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

Application of Virginia Electric and	)
Power Company, d/b/a Dominion North	)
Carolina Power, for Authority to	)
Transfer Functional Control of	)
Transmission Assets to PJM	)
Interconnection, LLC	)

REBUTTAL TESTIMONY OF JOSEPH BOWRING

PJM MARKET MONITOR

December 22, 2004

Q.1 ARE YOU THE SAME JOSEPH BOWRING WHO SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING?

A.1 Yes.

Q.2 WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A.2 The purpose of my testimony is to respond to some of the observations of Staff Witness Dr. Alan Rosenberg in his testimony in this proceeding. I will not attempt to respond to each and every point, rather I will respond to some of his key observations concerning the operation of the PJM Interconnection L.L.C. (PJM) markets and the role of the PJM Market Monitor.

Q.3 PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A.3 I believe a central question raised by Dr. Rosenberg's testimony is whether a transparent centrally organized wholesale market operated by an independent entity is superior to the bilateral wholesale market that Dominion North Carolina Power (Dominion) operates in today. Since the PJM market operates at the wholesale level, comparisons to retail cost of service regulation do not address the central issue.

Dr. Rosenberg raises issues associated with the potential for the exercise of market power and concerns with locational marginal pricing. I agree with Dr. Rosenberg that wholesale power markets require careful market monitoring in order to ensure that the efficiency benefits are realized. Integral to PJM's market design is the existence of independent market monitoring and cost-based local market power mitigation to prevent the exercise of market power. I describe that

market monitoring mitigation in my initial testimony and reference it in this rebuttal testimony.

Dr. Rosenberg appears to ignore the fact that PJM has very clear and effective rules for addressing local market power. Dr. Rosenberg also fails to cite any data supporting his claims regarding market power in PJM markets.

Q.4 PLEASE PROVIDE AN OVERVIEW OF YOUR RESPONSE TO DR. ROSENBERG'S TESTIMONY.

A.4 Dr. Rosenberg and I agree that the exercise of market power, if unchecked, can lead to adverse results. In fact, that is the precise reason why a strong and independent Market Monitoring Unit and market power mitigation were established at the inception of PJM's markets.

I am not suggesting that the PJM model is perfect or that careful monitoring of these markets is unnecessary. Security constrained central dispatch with LMP, price transparency, the full set of PJM market rules, and independent market monitoring are all components of an efficient, competitive wholesale market.

Dr. Rosenberg does not cite any facts or data about the PJM markets to support his claims about the exercise of market power. The PJM Market Monitoring Unit (MMU) has concluded that the PJM market results have been competitive, based on objective measures, for each year of operation. Each year, the MMU produces a detailed State of the Market Report on the PJM Market, copies of which are provided to state commissions, the Federal Energy Regulatory Commission (FERC) and all market participants. The MMU has concluded in

every case that the energy market results are consistent with a competitive outcome.

Q.5 IN LIGHT OF DR. ROSENBERG'S TESTIMONY, IN YOUR VIEW, WHAT IS THE FUNDAMENTAL ISSUE FOR THE COMMISSION'S CONSIDERATION CONCERNING THE WORKINGS OF THE PJM MARKET?

A.5 The fundamental issue is whether an organized transparent wholesale LMP-based market with oversight and market power mitigation is superior to today's wholesale bilateral market. Regardless of the details of retail regulation, electric utilities participate in wholesale power markets. The question then becomes what is the most efficient way to organize wholesale power markets. Thus the starting point for the Commission's analysis needs to be a comparison of the wholesale environment that exists today outside of organized markets and wholesale power markets as organized by PJM, and their relative impacts on retail customers.

Q.6 DOES DOMINION CURRENTLY OPERATE IN A WHOLESALE MARKET?

A.6 Yes. Dominion, along with just about every other major electric utility, buys and sells electricity in wholesale power markets. Utilities purchase electricity at wholesale when it is cheaper to do so than to generate from their own resources. They also may purchase from other companies at wholesale when they experience a plant outage. Electric utilities routinely sell excess generation in the wholesale market when it is economic to do so.

The wholesale market that Dominion and other non-ISO utilities operate in today is characterized by bilateral transactions, a lack of price transparency, and the absence of consistent detailed market monitoring. In other words, transactions are between individual buyers and sellers. There is no one place where buyers and sellers can obtain real time information on system conditions or the hourly price of electricity on a day ahead or real time basis. Price discovery depends on brokers or proprietary trading platforms and none of that information reflects real time system conditions. In addition, bilateral transactions are typically limited to pre-specified blocks of hours. Bilateral markets are an essential part of the PJM wholesale markets since they clear residual imbalances and complement and hedge the spot market. However, it is the transparency and efficiency of the PJM energy market that permits the bilateral markets to function more effectively in the PJM context than they do on a stand alone basis.

Furthermore, in an unorganized bilateral market, uncertainty exists as to whether a given transaction will go through or will be curtailed. A utility can arrange a wholesale transaction, beneficial to its customers, that is curtailed through the calling of Transmission Loading Relief (TLR). The TLR may be called despite the fact that a lower cost or more efficient alternative to alleviate the affected constraints may exist on a neighboring system or in another state.

LMP is superior to TLRs as a congestion management tool since it is expressly designed to produce a more efficient overall dispatch of generation resources to resolve congestion. LMP will reflect the cost to clear the constraint on the constrained side of a facility, thereby signaling to the market the need for

additional supply and/or reduced consumption at a location. TLR procedures, on the other hand, are used to curtail broad categories of transactions based upon whether a transaction's effect on a constrained facility exceeds a defined impact. A TLR affecting a broad category of transactions can at times be replaced with the redispatch of one or two units at substantially lower cost.

PJM rebuttal witness Bob Hinkel will describe the impact of TLRs, especially on a system such as Dominion North Carolina Power which is a net importer of power.

Q.7 WHAT IS YOUR RESPONSE TO THE IMPLICIT ASSUMPTION ABOUT WHOLESALE MARKET STRUCTURE AND ITS RELATIONSHIP TO DR. ROSENBERG'S TESTIMONY?

A.7 My view is that an organized, centrally dispatched, security constrained, independently operated, transparent wholesale marketplace is superior to a purely bilateral wholesale marketplace. The PJM market will provide the North Carolina Utilities Commission with information that it does not have today about wholesale power costs. PJM provides a liquid wholesale power market that includes transparent nodal prices posted on a five-minute basis that reflect the cost of the most efficient resources required to operate the system, subject to system reliability requirements. The economic signals provided by PJM to generators allow redispatch of units over a large market footprint. This increases the efficiency of the market and reduces the chance that an inefficiently large number of economic transactions will be curtailed in order to relieve a constraint.

Dr. Rosenberg does not explicitly address whether an organized transparent wholesale market, such as PJM's, would be better for Dominion customers than the present, non-transparent bilateral wholesale market. Since PJM's market operates at the wholesale level and leaves retail ratemaking issues to the states, comparing cost of service retail ratemaking to PJM's market is not the relevant focus.

Q.8 WHAT ARE THE MITIGATION MEASURES IN PLACE TO ENSURE AGAINST THE EXERCISE OF MARKET POWER?

A.8 PJM relies upon competition to limit market power in the overall energy market. In the absence of local market power issues, the only explicit rule governing what generators can offer in the PJM energy market is the $1,000 per MWh overall offer cap. The energy market results have generally been consistent with competition, and consequently energy prices rarely reach this offer cap.

To prevent the exercise of local market power, the energy market offers submitted by generators that were in service or under construction prior to July 9, 1996 are capped at the unit's marginal cost plus 10 percent when they are required to run to relieve a transmission constraint. PJM caps these units' offers at the higher of market prices outside of the particular constraint or the unit's costs plus 10 percent, in order to prevent the exercise of local market power. Thus, with respect to local market power, there is a strong mitigation tool in place. For units with construction start dates after July 9, 1996, PJM does not have blanket authority to mitigate units to their cost based offers. However, PJM can petition the FERC, on a fact-specific basis, for the ability to mitigate those units that could

exercise market power. There are no such mitigation rules in existence for bilateral wholesale markets in non-RTO areas or an independent entity to administer them in real time.

Q.9 ON PAGE 13 OF HIS TESTIMONY, DR. ROSENBERG HIGHLIGHTS THAT IN THE 2003 STATE OF THE MARKET REPORT, YOU SUGGESTED THAT THE POTENTIAL FOR MARKET POWER REMAINS. DO YOU AGREE WITH DR. ROSENBERG'S CHARACTERIZATION OF YOUR STATEMENT IN THE STATE OF THE MARKET REPORT?

A.9 No. The assertion that LMP-based markets increase the potential for market power abuse is not correct. As a general matter, wholesale power markets that rely on systems other than LMP are more susceptible to market power than are LMP-based markets. The LMP-based system does not create the potential for local market power, it simply makes it explicit when the potential exists and thus makes it possible to address local market power in a relatively surgical manner. The PJM system has a clear and effective set of rules for preventing the exercise of local market power.

The referenced quote from the State of the Market Report states that market-power related risk would exist in specified local areas in the absence of generation owners' obligation to serve load. The Report makes clear that PJM's local market power mitigation rules are an effective means of preventing the exercise of such local market power.

As a general matter, the potential for market power is a concern in all wholesale market designs. The PJM market design has the advantage of a clear and effective set of rules for preventing the exercise of local market power.

Q. 10 DR. ROSENBERG ASSERTS IN PAGES 6-8 OF HIS TESTIMONY THAT PJM USES A BID BASED RATHER THAN A COST BASED SYSTEM, SUGGESTING THAT COSTS ARE HIGHER UNDER PJM'S SECURITY CONSTRAINED ECONOMIC DISPATCH THAN PRICES ARE UNDER DOMINION'S CURRENT DISPATCH. DO YOU AGREE WITH THIS ASSERTION?

A. 10 While Dr. Rosenberg is right that PJM's security constrained economic dispatch is based on bids as opposed to cost of service, his analysis assumes that the bids will be above marginal costs. The evidence simply does not bear this out. The PJM Market Monitoring Unit (MMU) has concluded that the PJM market results have been competitive, based on objective measures, for each year of operation. While it is correct that, in a competitive market, every generator can choose how to offer its units to the market, it is competition that results in generators offering units at their marginal costs because that is the profit maximizing strategy in a competitive market. As one indicator of market power, the MMU compares PJM's market clearing prices to the marginal costs of operating generators, in order to determine the relationship between observed prices and competitive prices. The MMU has concluded in every case that the market results are consistent with a competitive outcome.

Q.11 DOES THAT CONCLUDE YOUR REBUTTAL TESTIMONY?

A.11 Yes, at this time.