PUBLIC SERVICE COMMISSION
OF WEST VIRGINIA
CHARLESTON

Case No. 07-0508-E-CN

TRANS-ALLEGHENY INTERSTATE LINE COMPANY

Application of Trans-Allegheny Interstate Line Company for a certificate of public convenience and necessity under W. Va. Code § 24-2-11a authorizing the construction and operation of the West Virginia segments of a 500 kV electric transmission line and related facilities in Monongalia, Preston, Tucker, Grant, Hardy, and Hampshire Counties, and for related relief

REBUTTAL TESTIMONY OF JOHN M. REYNOLDS

January 4, 2008

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is John M. Reynolds, and my business address is 955 Jefferson Avenue, Valley Forge Corporate Center, Norristown, Pennsylvania 19403-2497.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by PJM Interconnection, L.L.C. ("PJM"), a regional transmission organization ("RTO"), as a Senior Engineer in the Capacity Adequacy Planning Department. My responsibilities include analysis of historical loads and development of the long-term load forecast for the PJM region, and support of the PJM capacity markets. I serve as chairman of the PJM Load Analysis Subcommittee.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND EDUCATIONAL BACKGROUND.

A. I have been employed by PJM since June 1998, as a Senior Engineer in the Capacity Adequacy Planning Department.

In addition to my work for PJM, I contribute to the activities of the North American Electric Reliability Corporation (formerly the North American Reliability Council) ("NERC"), currently as chairman of the NERC Load Forecasting Working Group, and I am a member of the Electric Utility Forecasters' Forum (formerly serving as President). I have testified previously on ratemaking matters in proceedings before state commissions.

Prior to joining PJM, I was employed by the Delmarva Power & Light Company for twelve years in load research and load forecasting functions. Prior to that, I worked for Chase Econometrics for four years as an automotive market analyst. In that position, I developed forecasts of passenger car and light truck production.

I hold a Bachelor of Arts in Economics and a Master of Arts in Economics, both from the University of Delaware.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. No.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR REBUTTAL TESTIMONY.

A. This rebuttal testimony addresses various assertions presented in the direct testimony of Dr. Michael Ileo, a witness presented by the Staff of the Public Service Commission. At pages 11-18 of his testimony, Dr. Ileo notes that although he has not specifically investigated the econometric procedures underlying PJM's load forecasting methodology, he nonetheless raises questions about the load growth assumptions on which PJM's identification of the transmission system reliability violations is based. My testimony confronts Dr. Ileo's assertions on this topic.

My description of PJM's load forecasting process in this testimony also serves to rebut the assertions by other witnesses opposed to TrAIL – particularly Ronald Klein on behalf of the Halleck-Triune Community – asserting generally or by

implication that PJM's load growth projections are too "uncertain" to form the basis for PJM's transmission planning.

Q. WILL YOU BE USING THE SAME TERMS IN YOUR DIRECT TESTIMONY AS SET FORTH IN THE TABLE OF NOMENCLATURE ATTACHED TO THE APPLICATION?

A. Yes. In addition, I may define other specific terms in my rebuttal testimony.

Q. HAVE YOU ATTACHED ANY EXHIBITS TO YOUR TESTIMONY?

A. Attached to this testimony are the PJM Load/Energy Forecasting Model White Paper (Exhibit JMR-1), the 2006 PJM Load Forecast Report (Exhibit JMR-2), and (iii) Table E-1 from the 2007 PJM Load Forecast Report (Exhibit JMR-3).

I. DESCRIPTION OF PJM'S LOAD FORECASTING MODEL

Q. HOW WERE YOU INVOLVED IN THE PREPARATION OF THE PJM LOAD/ENERGY FORECASTING MODEL WHITE PAPER AND THE 2006 PJM LOAD FORECAST REPORT?

A. I was the primary author of the PJM Load/Energy Forecasting Model White Paper. I am a member of the team that prepared the 2006 Load Forecast Report and was responsible for sponsoring the report before PJM stakeholders.

Q. WHAT DOES THE PJM LOAD/ENERGY FORECASTING MODEL WHITE PAPER DESCRIBE?

A. The white paper describes PJM's prior load forecast methodology and the reasons why PJM came to develop an independent forecast function. It traces the development of the current forecast methodology through the publication of the first forecast and outlines ongoing enhancements to the model.

Q. PLEASE DESCRIBE THE PJM LOAD FORECASTING MODEL.

A. PJM's load forecasting model produces estimates of the monthly peak loads of each of the eighteen PJM zones, as well as of the total RTO. Forecasts are developed for each zone's non-coincident peak and the zone's share of the RTO peak. The econometric models are supplemented with a Monte Carlo estimation process to derive a distribution of forecasts over a wide range of possible weather conditions.

Q. WHAT ARE THE PRIMARY DRIVERS OF THE FORECAST?

A. The models are driven by calendar effects (day of week, month, minutes of daylight, etc.) and anticipated economic conditions in the region as well as weather conditions.

Q. WHAT DOES THE 2006 LOAD FORECAST REPORT CONTAIN?

A. The load forecast report presents the results of PJM's forecasting model for years 2006 through 2016. For each PJM zone, region and the RTO, three years of monthly peaks are presented. Ten years of forecasted annual summer and winter

peaks are presented, as well as estimates of load management delegated to PJM for dispatch. Seasonal peaks are presented for selected combinations of zones.

Q. PLEASE DESCRIBE THE LOAD FORECAST FOR THE ALLEGHENY POWER ZONE.

A. The Allegheny Power Zone forecast includes all load connected to the transmission system, which includes the retail loads of Allegheny Power, as well as the load of all municipal and cooperative systems located in the territory. In the 2006 PJM Load Forecast Report, the Allegheny Power zone is projected to have summer peak growth of 1.0% per year, growing from 8,030 MW in 2006 to 8,905 MW in 2016. The Allegheny Power Zone's winter peak forecast is projected to grow at 1.1% per year, from 7,872 MW in 2005/06 to 8,790 MW in 2015/16.

Q. WHAT INPUT DO TRANSMISSION OWNERS HAVE INTO THE LOAD FORECAST RESULTS?

A. PJM asks the Transmission Owners for input related to large, unexpected load changes.

Q. DID ALLEGHENY POWER PROVIDE ANY INPUT OF THIS SORT INTO THE 2006 PJM LOAD FORECAST REPORT?

A. Yes. Allegheny Power notified PJM that the Ohio portion of its Monongahela Power operating company would be sold effective January 1, 2006 and that its largest customer, an aluminum plant, would cease operations at the end of 2005.

Consequently, the 2006 load forecast reflects a reduction in the Allegheny Power zone summer peak forecast by 650 MW for each year of the forecast.

Q. DOES PJM PRODUCE FORECASTS FOR AREAS WITHIN THE ZONES?

A. No. The forecasts are only at the zone level. Distribution companies use the PJM zone forecasts to develop load studies down to the level of load buses.

II. RESPONSE TO DR. ILEO'S CONCERNS ABOUT PJM'S LOAD FORECASTING

Q. BEFORE YOU ADDRESS DR. ILEO'S TESTIMONY, COULD YOU SUMMARIZE HIS ASSERTIONS ABOUT PJM'S LOAD FORECASTING?

A. Dr. Ileo begins his testimony on PJM's load forecasting by asserting that PJM's current projections of load growth in the PJM Region show an "acceleration" in load growth rates relative to PJM's historical experience. (Ileo at 12.) Expressing surprise at this outcome, Dr. Ileo indicates his belief that it represents a significant variance from "other demographic and economic forecasts" for the geographic area served by PJM. (Id. at 13.) He goes on to identify historical and projected data, derived from Census Bureau reports, on annual growth in population, households, and housing units, and to assert that PJM's load growth projections should have borne a closer relationship to those growth projections. (Id. at 13-14.) The balance of Dr. Ileo's testimony on this topic asserts (i) that PJM's load forecasting methodology has not undergone "independent" review; (ii) that

recommendations from a recent (although, apparently in Dr. Ileo's view, not independent) review have not been shown to have been implemented; and (iii) taking up his earlier theme, that if PJM's load growth projections had been "more in line" with what he believed to be "historical" experience, then the claimed need for TrAIL "might" be affected. (Id. at 14-18.).

Despite the detail reflected in his assertions, Dr. Ileo repeatedly concedes that he has "not conducted the comprehensive studies necessary to fully evaluate" PJM's load forecasting procedures. (Id. at 13, 12.) Nevertheless, Dr. Ileo is able to conclude that an assessment of the "reasonableness" of PJM's electric demand projections cannot be made. (Id. at 12.)

Q. PLEASE RESPOND TO DR. ILEO'S ASSERTION THAT THE INDICATED ACCELERATION IN PJM'S FORECAST OF LOAD RELATIVE TO HISTORICAL EXPERIENCE IS MORE PRONOUNCED FOR THE YEARS 2006 TO 2011, AND THAT THIS PROJECTION VARIES SIGNIFICANTLY FROM OTHER "DEMOGRAPHIC AND ECONOMIC FORECASTS" FOR THE GEOGRAPHIC AREA.

A. Contrary to Dr. Ileo's assertion, PJM's forecast for PJM RTO summer peak growth ***does not*** represent an acceleration from recent historical load growth trends. This fundamental misunderstanding of data drawn from PJM's 2006 Load Forecast Report (Exhibit JMR-2) permeates Dr. Ileo's conclusions and apparently

serves as the basis for his "surprise" at PJM's load forecast results. (Id. at 13.) This misunderstanding also prompted Dr. Ileo to prepare his comparison of PJM's load forecasting to certain Census Bureau information (Id.) and to contrast what he believes to be PJM's historical growth experience with Allegheny Power's experience (Id. at 14.)

Q. WHAT IS THE NATURE OF DR. ILEO'S MISUNDERSTANDING ON THIS POINT?

A. The historical data cited by Dr. Ileo in Exhibit MJI-2 does not represent ***historical*** load growth, but rather previous ***forecasts*** of PJM load growth. Furthermore, the forecasts Dr. Ileo cites pertain to the PJM power pool prior to its recent, significant expansion into a Regional Transmission Organization. PJM's estimate of annualized growth of the weather normalized summer peak for the period 1998 to 2006 (the longest period for which complete load data for the current RTO membership is available) is 2.6%.[1] When compared to Dr. Ileo's estimate of projected PJM RTO load growth for the 2006-2011 period of 1.77% as shown in Dr. Ileo's Exhibit MJI-2 (which is correctly calculated from the 2006 PJM Load Forecast report), it is clear that PJM expects a ***deceleration*** in the growth of the PJM RTO summer peak. Therefore, Dr. Ileo's assertion that PJM assumed an

[1] The data for this calculation is available in Table E-1 of the 2007 PJM Load Forecast Report. A copy of this table is provided as Exhibit JMR-3 to this rebuttal testimony.

"accelerated" rate of load growth when compared with historical experience is simply not accurate.

Q. DR. ILEO ALSO ASSERTS THAT PJM'S LOAD GROWTH PROJECTIONS SHOULD TRACK "DEMOGRAPHIC AND ECONOMIC" PROJECTIONS DRAWN FROM CENSUS BUREAU DATA. PLEASE RESPOND TO THIS ASSERTION.

A. While I agree with Dr. Ileo that electricity use is affected by growth in population and household formation, it is completely incorrect to assert that peak load growth will be perfectly correlated to the growth in these factors. To do so would not allow for the changing intensity of electricity usage in residential customers, and would completely ignore the driving influences on commercial and industrial usage.

Q. HOW DOES PJM'S LOAD FORECASTING METHODOLOGY REFLECT THESE INFLUENCES?

A. PJM's load forecast utilizes Gross Metropolitan Product as its primary economic driver, a measure that is more comprehensive of economic activity than population or household formation, and that correlates more closely with electricity usage. In addition, PJM's load forecast model incorporates influences other than economics and demographics. These influences are outlined in Attachment JMR-1. Accordingly, I strongly disagree with Dr. Ileo's assertions (i) that PJM's load

forecasting is suspect or unreliable and (ii) that his projections of load growth, based only on the demographic and economic trends that he cites, are valid or in any way useful to the Commission.

Q. DO YOU HAVE ANY COMMENT ON WITNESS ILEO'S STATEMENT THAT NO INDEPENDENT STUDIES HAVE BEEN PERFORMED ON THE LOAD FORCASTING METHODOLOGIES USED BY PJM?

A. Yes. Dr. Ileo is wrong on this count as well. It is perplexing that Dr. Ileo would assert that PJM's load forecasting methodology has not been subject to an independent review, and in the next breath cite from just such a review. The Brattle Group (TBG) report mentioned in Dr. Ileo's testimony was commissioned by PJM and assuredly represents an independent evaluation of PJM's load forecasting methodology that reflects the opinions of TBG, not those of PJM. Indeed, Dr. Ileo appears to be sufficiently confident in the value (and, one can assume, the independence) of the TBG report to endorse some of its recommendations. (Id. at 15.)

Q. THE TBG REPORT SUGGESTED TECHNICAL IMPROVEMENTS TO PJM'S METHODOLOGY, INCLUDING THOSE ADDRESSING STRUCTURAL CHANGES IN THE ECONOMY. ARE THESE TECHNICAL IMPROVEMENTS INCORPORATED INTO PJM'S LOAD PROJECTION PROCESSES?

PJM adopted many of the recommendations made by TBG for the 2007 PJM Load Forecast Report. These recommendations included the following:

- Seasonal or Monthly Models – PJM increased the seasonality of the independent variables in the model.

- Consider alternative weather variables – PJM developed separate weather measures for summer, winter and shoulder months.

- Correlating diversity with weather conditions – the processing of results of the model were revised to model diversity such that it is now greater at mild weather conditions and declines as weather becomes more extreme.

- Using seasonal data to develop annual peak forecasts – the PJM model now aggregates data over the summer season instead of relying on the month of July.

Moreover, PJM's 2008 Load Forecast Report will incorporate the TBG recommendation regarding consistency between energy and load forecasting by adding a PJM energy forecast for each transmission zone and the PJM RTO. In addition, PJM will continue development of the load forecast model, giving consideration to the TBG report and other issues which may arise.

In any event, Dr. Ileo does not point out which, if any, of the TBG recommendations that, if adopted, would have affected the outcome of the PJM's 2006 load forecasts, or how those forecasts would have been affected. In other words, apart from proving the existence of an independent evaluation of PJM's load forecasting methodology, Dr. Ileo's discussion of the TBG report offers the

Commission little on which to evaluate that methodology or the results of PJM's application of it.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.