

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Demand Response in Wholesale Markets Docket No. AD07-11-000

TESTIMONY OF WILLIAM H. WHITEHEAD
ON BEHALF OF
PJM INTERCONNECTION, L.L.C.
April 23, 2007



I appreciate this opportunity to appear before the Commission on the panel chosen to discuss “Demand Resources as an Alternative or Complement to Transmission Expansion” as part of today’s Technical Conference. I am William Whitehead, Executive Director – State Government Policy. Previously I held positions in Transmission Strategy and Transmission Planning at PJM. I have been involved with the public policy and technical aspects of demand response. This experience affords me a unique perspective on the implementation of demand response in transmission expansion. Throughout my tenure at PJM I have worked to ensure that our planning process is both holistic and effective in meeting the needs of customers in the region. I led the stakeholder processes which resulted in the filing of our revised economic planning protocol, and I have worked with the Organization of PJM States (OPSI) to consider cost allocation and related planning issues for the region.

I will address each of the Commission’s questions posed to this panel and will be available to summarize my testimony at the Technical Conference. At the outset, I should note that PJM is in the process of implementing a new economic planning protocol designed to directly address many of the issues raised by the Commission in its questions. On November 21, 2006, the Commission approved our submittal in Docket No. ER06-1474 but requested additional information in our compliance filing concerning the integration of demand response into the economic planning process. On March 21, 2007, PJM submitted that detail in its compliance filing, which is now pending before the Commission. In the interim, we are proceeding with implementing our economic planning process, including the integration of demand side response into PJM’s new economic planning process. Specifically, PJM is analyzing the economic impacts of proposed new transmission projects to help determine the most efficient solution(s) to reliability issues that occur over the next 15 years. The results of this analysis will be presented to PJM’s Transmission Expansion Advisory Committee on May 9, 2007, prior to the PJM Board’s considering these projects for approval. One unique aspect of the new economic planning process is that, after identifying these solutions, PJM will provide information to the marketplace that will estimate the amount and type of demand response resources that could achieve a similar effect as transmission solutions. In addition, the new economic planning process will allow PJM to work with the states and interested stakeholders in a collaborative process to evaluate a number of different demand response options.

Question 1: Do current transmission planning processes integrate demand resources as an alternative or complement to transmission system upgrades? If so, how, and is this approach sufficient? Are other forms of demand reduction such as load shedding, incorporated into current transmission planning processes? If so, how?

Response: Demand response plays an important role in PJM’s economic transmission planning process. In many cases, demand response resources (as well as generation resources) can serve as alternative solutions to addressing congestion and reliability needs. As a result, the development of demand response is a critical factor to analyze in determining the needed level of transmission upgrades. A certain level of demand response is included in the PJM load forecast, which is updated annually and initiates the annual expansion planning process. Load shedding programs (Interruptible Load Resources or ILR) are explicitly included in the planning analysis and may impact the plans for new transmission depending on the amount and location of ILR. PJM believes it is vital to fully consider demand resources both in reliability and economic planning.

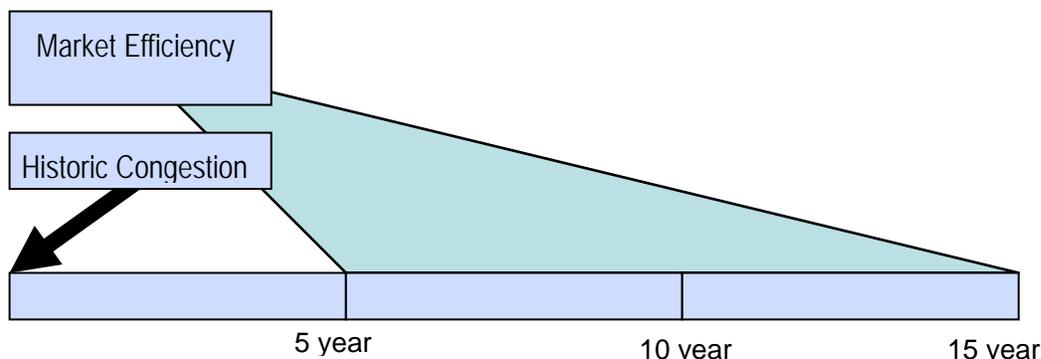
Of course, there are unique challenges presented in the consideration of demand response particularly in the area of reliability planning. These challenges need to be addressed and not ignored. In PJM, through the Reliability Pricing Model as well as our planning protocols, we have addressed the unique issues associated with relying upon demand resources to address reliability and economic needs of the region.

PJM's Regional Transmission Expansion Plan (RTEP) is a transmission plan detailing needed transmission upgrades. The RTEP process allows the PJM Board to direct the construction of transmission enhancements, but, under its tariff, PJM has no authority to "plan" or order the direct installation of generation or demand response resources. Within the PJM region, there are both bundled and unbundled states. PJM's RTEP process is designed to complement not supplant individual state jurisdiction over bundled (or unbundled) generation within an individual state's jurisdiction. Although in some cases demand response is provided by the traditional utility under direction of the state public utility commission, there is no ability to "order" loads to use demand resources at peak times even if those resources were available. Rather, PJM utilizes transparent price signals as well as transparent price information to allow suppliers and customers to develop a business case for deployment and use of demand resources. By the same token, the availability of demand response resources is a key input into the decision as to the type and extent of transmission upgrades needed.

PJM's Reliability Pricing Model is a critical means for PJM, as the transmission planner responsible for long term reliability, to identify, on a forward basis, demand response resources which can be considered "utility grade resources" available to address projected reliability violations. Demand response resources are able to bid into the RPM market and enjoy a fixed revenue stream for their commitment. Because the demand response resources have made a definite commitment to be available for a period of time, similar to a generation resource's commitment to be available to run, PJM's reliability planning specifically "counts" and relies upon such resources, in the same manner as planned generation or transmission, in determining compliance with NERC and other planning reliability criteria.

When undertaking economic planning (i.e. planning to reduce congestion and improve the economics of the grid rather than solely meeting reliability criteria), PJM includes assumptions regarding anticipated demand response and generation in its market efficiency analysis. Included in the assumptions are demand resources that are committed in the RPM process. ILR (formerly Active Load Management) also are included in the assumptions as resources which are expected to be available with a high degree of certainty. PJM will go further, however, and also analyze trends to determine expected future levels of demand response resources beyond the RPM commitment years. The future expected levels of demand response will be based on analyses that consider historic levels of demand response, expected demand response growth trends, impact of capacity prices, current and emerging technologies, and sensitivity analyses of the foregoing. All of this information will be open, transparent and developed by working with stakeholders in a public process.

Figure 1: Market Efficiency Analysis



The economic planning process is designed to provide critical information both to states and to the marketplace. In addition to analyzing the type of upgrade which would be needed to alleviate projected congestion, PJM also will use the planning process to answer the reverse question i.e. “what level and type of demand response would alleviate the need for a planned economic upgrade?” Providing both the level and type of demand response that will preclude the need for an economic upgrade will enable market participants and state commissions to make better decisions with regard to implementing demand response and to target the most effective means to utilize this resource. For example, an economic-based upgrade may be eliminated by a five percent increase in demand response if the demand response is peak-shaving (i.e. energy usage is eliminated) or by a ten percent increase if the demand response is peak-shifting (i.e. energy usage is shifted to a later period). Dissemination of this type of information also will permit stakeholders and the states to better evaluate the benefits of developing different types of demand response programs. Given the planning process’ fifteen-year planning horizon, this demand response-related information, along with information regarding new generation, will enable stakeholders and demand response entrepreneurs to determine if they desire to develop demand response resources or generation as market alternatives. All of these points are outlined in PJM’s March 21, 2007 compliance filing in Docket No. ER06-1474.

Question 2: What would be the key elements of a planning process that integrates demand resources as an alternative or complement to transmission facilities additions? What should be the means to determine the costs and benefits of a demand resource alternative or complement to transmission upgrades?

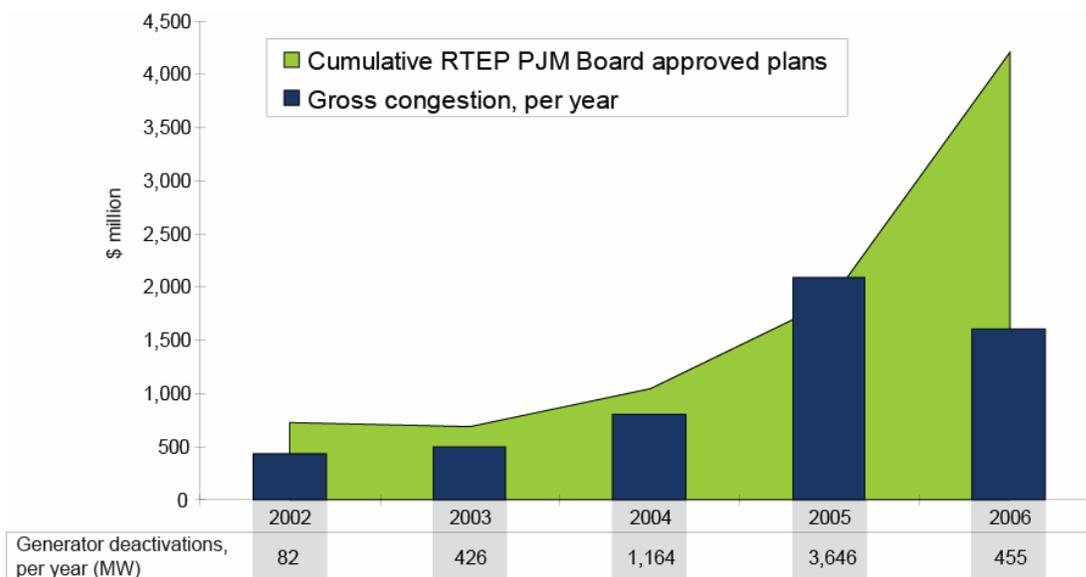
Response: Two key elements are information and transparency. Because demand response resources are essentially an unregulated resource (at least as to the consumer’s deployment and use of the resource), demand response will flourish when providers have the information necessary to make the business case for their particular demand response resource. PJM’s process will disseminate information analyzing both what is available and what is needed in order to enable market participants to better determine the types and level of demand response to deploy. Consequently there will be additional opportunity for market-based alternatives to transmission upgrades to be developed, such as demand response resources. This information will also help to

spur technological innovation as specific system needs (and resulting cost/benefit analysis) will become more apparent to entrepreneurs.

Another key element for the successful integration of demand response into the planning process is providing transparency concerning the study assumptions regarding demand response trends. By definition, the assumptions used in any analytical process may be the subject of vigorous debate and disagreement. The transparency of the RTO planning process and the direct involvement of stakeholders allows for presentation of assumptions (and alternative assumptions) to the marketplace simultaneously and in a nondiscriminatory manner. This ensures that no particular resource or market participant has a competitive edge solely as a result of asymmetry of information.

As PJM explained in its economic planning compliance filing, PJM does not determine the most economic solution – demand response, generation or transmission. Rather, PJM includes alternative projects in its study assumptions and relies upon their availability in determining the need for economic-based upgrades in the first instance. Thus, the planning process is not a full blown “IRP-type” process where the regulator weighs various alternatives, any of which can be ordered. Rather, the assumptions concerning demand response resources provide information critical to the assessment of the cost/benefit analysis of a particular transmission upgrade that otherwise would be considered to address a reliability violation or alleviate congestion. Second, the process provides key information on “what it would take” to avoid the upgrade being needed.

Figure 2: PJM Market Annual Demand Response Activity



Question 3: What are the current advantages, challenges and obstacles to implementation of demand resources as an alternative or complement to transmission facilities additions?

Response: Including demand response in our market efficiency analysis assumptions enables more effective and informed transmission planning. Absent consideration of demand response resources, the planning process may be skewed to overly rely on generation resources or to overbuild transmission. Such results would then inevitably be challenged in subsequent state siting proceedings when the necessity for the project is further evaluated.

Of course, the decentralized nature of demand response resources and the many varied types of resources add a layer of complexity and additional challenges to the planning process. In particular reliability planning requires certainty and, there could be significant implications to the region as a whole should promised demand response resources (or generation resources) not materialize. The provisions of RPM are intended to address this eventuality, at least during the rolling three-year forward period. Moreover, as can be seen in the various filings in response to PJM's economic planning compliance filing, there are many different ways to analyze demand response resources and economic upgrades in general. Absent a consistent approach, demand response providers may lack coherent information needed to make a business case for their particular product or technological innovation.

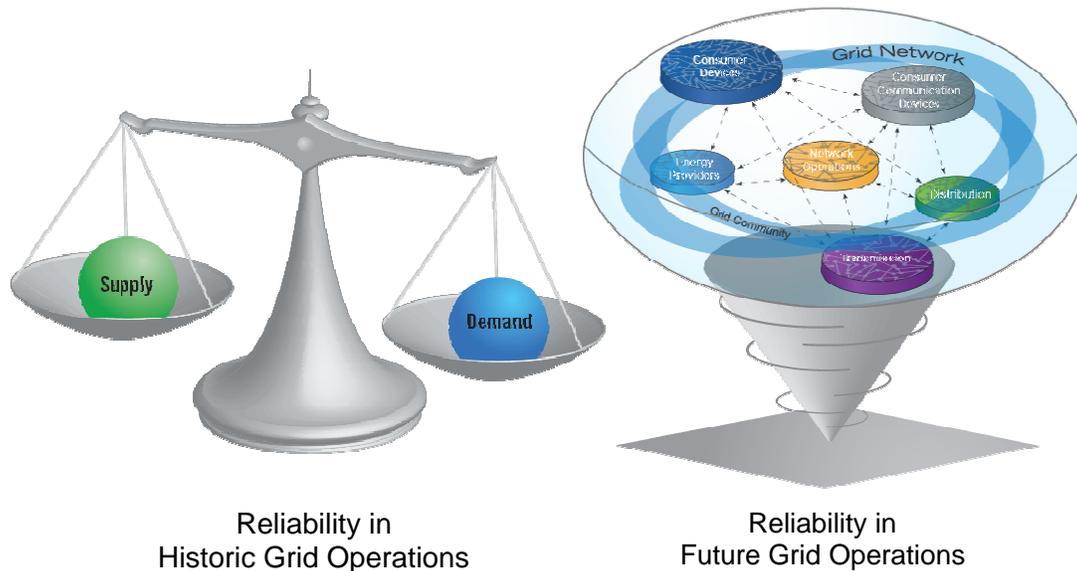
Question 4: What market design or ratemaking initiatives can be taken to encourage the deployment of demand resources, and enabling technologies, in operating and planning the transmission system?

Response: In its recently issued Strategic Report, PJM detailed its vision of the "Smart Grid" of the future. Specifically, PJM calls for deployment of "Service Oriented Architecture" designed to enable devices at all points of interconnection with the grid, from customer appliances to generators, to communicate with each other and respond to real-time system needs. The system would be kept in balance not by today's matching of supply and demand, but rather by keeping the network that supports this dynamic grid in constant motion, like a spinning top, with instantaneous communication between entities – transmission companies, energy providers, consumers, consumer devices and distribution companies. The network would provide the open architecture, "plug and play" technology needed for the full end-to-end integration of the power system. In this new state, real time information signals will trigger the use of distributed generation equipment, foster more use of renewable generation sources and deliver pricing signals to end-use smart devices, such as household appliances, plug-in hybrid electric cars and energy storage systems. It is a price signal from the meter to the air conditioner, "price to device," that triggers a programmed response that is then signaled back to the meter and then to the grid. The grid is a multitude of devices and Smart Grid provides the two-way information flow that directs them – all linked, all communicating and all performing at the same time.

Question 5: How should customers that provide a demand resource alternative / complement to transmission be compensated?

Response: Compensation for demand response is built into each aspect of PJM's market design. This issue is addressed in Mr. Ott's testimony submitted simultaneous with my testimony.

Figure 3: Reliability is Maintained by Keeping Power in Balance



PJM and its stakeholders have toiled for many months to arrive at the best mix of RPM, demand side in the marketplace and economic planning protocols in order to ensure that demand response resources are fully integrated into the marketplace. PJM has the experience of trial and error and has made revisions to its planning process to incorporate lessons learned from those experiences. PJM stands ready to work with its state commissions, stakeholders and this Commission to further improve the role of demand response in the wholesale marketplace. We thank the Commission for raising these important issues as part of a nationwide discussion of better integrating demand response into the wholesale market.