

PJM Load Response Pilot Program

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PJM Load Response Pilot Program

The PJM wholesale energy market has enjoyed unparalleled growth and activity since its inception in April of 1997. As a result of its overall liquidity and the flexibility provided to its participants, the PJM market is widely regarded as one of the more successful in existence. However, like other wholesale electric energy markets, when supply shortages exist the wholesale price of energy in PJM can rise to extreme levels, and would do so unchecked if not for the cap on generator bids. Greater efficiency would exist in the PJM marketplace, and indeed the bid cap might not even be necessary, if the load in PJM could respond to high prices and reduce demand during times of short supply.

The main obstacle to garnering price-responsive load in the PJM system is the fact that most end-use customers are not exposed to real time prices. Traditionally, Load-Serving Entities (LSEs) within the PJM control area have been required to provide retail electric service to their customers at rates approved by the applicable states' regulatory bodies. Limitation to these regulated retail rates continued even under wholesale deregulation and retail customer choice due to stranded cost agreements between existing, vertically integrated Investor-Owned Utilities (IOUs) and these same regulatory agencies. As a result of these retail price caps, LSEs may pay more for energy in the wholesale market than they collect from their retail customers during times when the wholesale energy price in the PJM market rises above the applicable retail rate. Savings could be realized by LSEs in the amount of the difference between the wholesale energy price and the capped retail rate in these instances if end-use customers would reduce their load.

In the past, the only entity in a position to request a customer to reduce load and share any such savings was the LSE that actually served that customer's load. However, that LSE may not desire or be able to provide the necessary infrastructure (metering, communications, accounting, etc.) to accomplish and monitor the load reduction at a cost that makes the reduction economically attractive for both parties. Other parties may be able to provide such services though, if they were able to benefit from the associated price differentials.

The goal of the PJM Load Response Pilot Program is to provide a mechanism by which any qualified market participant may offer end-use customers the opportunity to reduce the load they draw from the PJM system and share the relative savings. The program is not intended to be a replacement for Active Load Management (ALM), but rather an alternate method by which distributed resources and customers capable of reducing load can participate in PJM operations and markets. This document provides a summary of and detailed procedures for the program.

Program Participant Qualifications

Two primary types of distributed resources are candidates to participate in the PJM Load Response Pilot Program:

- ◆ A customer that has the ability to supply required load via local generators
 - These generators must be either non-synchronized to the grid or synchronized to the grid with no net export to the grid while serving local load.
- ◆ A customer that has the ability to reduce a measurable and verifiable portion of its load

LSEs arranging load reduction agreements with customers for whom they are the energy supplier need not register to participate in this program. (Data regarding expected load reductions is still required from these LSEs, as described in the “Implementation/Operations” section of this document.) Only those PJM participants arranging for load reductions with customers for whom another PJM member is the energy supplier must register for the program. PJM membership is required to participate, although any existing PJM Member may act as a third party for non-members. All payments are made to the PJM Member. Participants must become signatories to the PJM Operating Agreement, as described in the ***PJM Manual for Administrative Services for the Operating Agreement of the PJM Interconnection, L.L.C.***

To participate in the pilot program, the applicant must also meet the metering requirements as described in the next section.

Metering Requirements

The Load Response Pilot Program participants must have metering equipment that provides integrated hourly kWh values, for market settlement purposes, with a maximum of two percent error end-to-end (including PTs and CTs). The metering requirements can be met using either of the following two methods:

- ◆ Metering that is capable of recording integrated hourly values for generation running to serve local load, (net of that used by the generators).
- ◆ Metering that provides actual load change by measuring actual load during the reduction for comparison against a statistical measure of the value of the load had the reduction not occurred. All parties associated with a load reduction transaction (end-use customer, LSE, third-party participant) must agree to the acceptability of the statistical load pattern and the method utilized to calculate actual load reduction.

Transmission and distribution losses are not considered.

The installed meter must be one of the following:

- ◆ EDC-approved hourly meter, read by the EDC.
- ◆ Customer-owned meter that is read by PJM.

Note that various Internet applications now exist for transmission of real time metered data. Use of these applications is acceptable provided that PJM receives metered load reductions in a timely, reliable manner.

Registration

Participants must complete the PJM Load Response Pilot Program Registration Form that is posted on the PJM web site (www.pjm.com) and included in an attachment to this document. The following general steps will be followed:

1. The participant completes the PJM Load Response Pilot Program registration form and emails it to PJM. A separate registration form must be submitted for each customer for whom a different retail energy rate, T&D charge and/or other charges apply. Customers for whom ALL applicable charges are the same may be submitted on one form.

2. PJM reviews the application and ensures that the qualifications are met, including verifying that the appropriate metering exists. PJM also confirms with the appropriate LSE and EDC whether the load reduction is under other contractual obligations (e.g., LSE's ALM program). Other such obligations may not preclude participation in the program, but may require special consideration by PJM such that appropriate settlements are made upon actual program implementation.
3. PJM informs the applicant of acceptance into the pilot program and notifies the appropriate LSE and EDC of the participant's acceptance into the program.
4. Any end-use customer intending to run distributed generating units in support of local load for the purpose of participating in this program must submit to PJM the applicable environmental permits for running those generators. In the event no environmental permitting has been obtained, written justification for the lack of permits must be provided to PJM.

Implementation/Operations

The Load Response Pilot Program is not based on the declaration of emergency conditions in PJM, but rather on the economic decisions of the PJM market participants. That is, the participants in the Pilot Program are responsible for determining the conditions under which load reductions will actually take place and implementing the reductions should those conditions arise. The prime indicator of such conditions is assumed to be the Locational Marginal Price (LMP) of energy on the PJM system.

In order to maintain adequate system control, PJM operators will be required to know the amount of load expected to be reduced at varying price levels. These amounts may change on a daily basis. Each PJM market participant is therefore responsible for informing PJM daily of the amount of load reduction for which they have contracted in each PJM zone, and the price at which that load will be reduced. A web page will be created through which market participants may submit the expected amount of load reduction on a zonal basis, together with the zonal LMP values at which the load will be reduced. PJM will then compile daily aggregate load reductions on a zonal basis for use in operations.

It may be possible for load reductions to set price on the PJM system. The requirements for setting price will be as follows:

- ◆ The load must have a bid in place (via the web page mentioned above),

- ◆ the reduction must be metered in real time, and
- ◆ the load must respond to price as indicated by its bid.

Further details regarding the method by which load reductions are dispatched for the purpose of setting price will be determined and set forth in these procedures.

Verification

For load reduction that is not metered directly by PJM (i.e. – is collected by the EDC), data is to be submitted to PJM within 45 days of the event. If the data is not received within 45 days, no payment for participation is provided. Meter readings must be provided for the hour prior to the event, as well as every hour during the event.

The EDC may communicate the meter readings to PJM via file transfer to the Load Response FTP site. Files that are FTPed must be in the PJM-approved file format (see attachment). PJM will forward directly metered data to the appropriate Distribution Company immediately following an event for optional review. Data files submitted after-the-fact will be forwarded to the appropriate parties upon receipt. The LSE and/or EDC have five (5) business days to provide feedback to PJM. All load reduction data is subject to PJM Market Monitoring Unit audit.

Market Settlements

In the event that the party contracting for a load reduction is the LSE that actually serves that customer's load, PJM will make no adjustments to the settlement process. If the load reduction is arranged by a third party, PJM will collect the appropriate funds from the LSE and allocate those funds to the third party. The amount collected and allocated will be equal to the hourly integrated Locational Marginal Price (LMP) for the zone in which the load resides less the appropriate retail rate, T&D charges, etc. applicable to the customer as indicated on the registration form. Allocation of these funds will be based on the kWh relief provided. The magnitude of relief provided can be less than, equal to, or greater than the kW amount declared on the Load Response Pilot Program Registration form.

The third party PJM Member is also assessed a \$10 transaction fee per account for each event in order to offset the PJM costs associated with this additional allocation.



Pilot program credits will appear on the PJM Member's monthly bill, as described in the ***PJM Manual for Operating Agreement Accounting*** and the ***PJM Manual for Billing***.

Reporting

PJM will submit the required reports to FERC on behalf of the Load Response Pilot Program participants. PJM will also post this document, as well as any other program-related documentation on the PJM web site.

PJM will also report the names of those end-use customers who indicated that distributed generation would be run in support of the load reduction program to the EPA, together with the permitting information that was supplied upon registration. Confidentiality of this information will be maintained by the EPA.

At the completion of the pilot program, PJM will prepare a report that summarizes the pilot program and will submit it to the PJM Members, the Reliability Committee, the Energy Market Committee, and the Operating Committee for review.

Load Response Registration Form

All participants in the Load Response Pilot Program must complete a registration form. The completed registration form should be emailed to PJM (to the address posted on the PJM web site along with the form.) Upon receipt, PJM will review the form and provide feedback to the requesting participant.



PJM Load Response Pilot Program Registration Form Summer 2001

PJM Member Name: PJM Member Org ID (if known) End-Use Customer Name Distribution Company (zone) EDC Account Number Energy Supplier		
I. Please select how the load meets the hourly meter reading requirements (check one) <input type="checkbox"/> EDC-approved hourly meter <input type="checkbox"/> Customer-owned meter, read by PJM		
II. What is the capacity of the interruptible?		kW
III. <u>Operational Characteristics</u>		
A. How is the reduction effected? Is it load to be cut? Is it generation to be started? Is it both load to be cut and generation to be started? How much load will be supported by local generation in the event of a reduction?		 Yes or No Yes or No Yes or No kW
B. Enter the total value of all applicable retail charges for this customer, including retail energy rate, T&D, and any other applicable charges. If any or all of these charges are not constant but rather are based on a formula, please explain in detail below:		 cents/kWh

C.	Approximate zonal LMP at which end-use customer will reduce load.		\$/MWh
	Submitted by: Title: Date: Phone: Fax: e-mail Received at PJM by: Date: Submit this form to:	<div style="background-color: #cccccc; height: 150px; width: 100%;"></div>	

Meter Data File Format

Load Response Pilot Program participants may communicate meter readings to PJM via file transfer to the Load Response FTP site. Files that are FTPed must indicate the PJM member and customer account for which they apply, be in CSV file format and include the following columns:

- ◆ Clock hour ending
- ◆ Hourly integrated load reduction (kWh)

Load Response Example

The scenario described below is intended to illustrate how PJM would calculate the payments made to a participant upon implementation of PJM's Load Response Pilot Program. The example assumes the customer has acquired the appropriate form of PJM membership, completed the PJM Load Response Pilot Program Registration Form, and been approved for participation by PJM. The following is a typical timeline by which this load could respond to price:

- 1300 – Appropriate zonal LMP reaches \$500.
- 1330 – Appropriate zonal LMP reaches \$600.
- 1400 – Appropriate zonal LMP reaches \$700.
- 1430 – Appropriate zonal LMP reaches \$800.
- 1630 – Appropriate zonal LMP falls to \$400.
- 1700 – Appropriate zonal LMP falls to \$250.
- 1800 – Appropriate zonal LMP falls to \$80.

Customer ABC has a typical load of 500kW. Of this load, approximately 150kW may be shut down within one hour, provided the PJM price reaches \$600/MWh. At 1400, PJM LMP reaches this point. Customer ABC immediately begins the process of disconnecting the applicable load. All such load is disconnected by 1445. At 1630, PJM LMP falls to a level at which Customer ABC wishes to reconnect the reduced load. All 150kW is restarted by 1715.

The following table illustrates how the customer metering and associated payments might appear:

Hour Ending	Integrated Load (kWh)	Delta (kWh)	Zonal LMP (\$/MWh)	Retail Charges (C/kWh)	Payment (\$)
1400	495	0	600	15	0
1500	467.5	32.5	775	15	21.13
1600	345	150	800	15	97.5
1700	348	147	400	15	36.75
1800	475	20	250	15	2.00