UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Midwest Independent Transmission System Operator, Inc. and PJM Interconnection, L.L.C	**)** **)** **)** **)**	**ER04 375-000**

MARKET MONITORS' REPORT REGARDING AEP SEAMS ISSUES

September 3, 2004

I. Introduction

We provide this report pursuant to FERC's Order Conditionally Accepting Joint Operating Agreement, issued March 18, 2004. That Order stated:

> Because AEP is not a party to the JOA and because an Enhanced Reliability Agreement has not yet been filed, we will require the market monitoring units to closely watch the situation along the seam (i.e., AEP) to be sure that no gaming or other inappropriate behavior takes place. We will direct market monitoring units to file a report identifying potential for gaming, actual experience, and proposed solutions to prevent opportunities for gaming, within 90 days after the integration of ComEd into the PJM market. If the market monitoring units find any such gaming or other inefficiencies, we may take appropriate action, as necessary, to remedy the situation. We will direct the market monitoring units, Midwest ISO and PJM to notify us immediately if gaming becomes apparent and direct further that they propose remedies. In addition, we expect AEP and PJM to address the concerns contained in the MMU Assessment when they file the Enhanced Reliability Agreement with the Commission.

This filing describes the results of our monitoring of the integration of ComEd into the PJM market, as well as our findings regarding the potential for gaming in the future.

II. Seams Coordination Process

The seam between AEP and PJM and AEP and MISO will continue until the integration of AEP into PJM on October 1. The PJM and MISO market monitors have been monitoring those seams and have not observed any significant gaming behavior. After October 1, the AEP-related seams issues will become part of the overall PJM-MISO seams issues which are addressed as described below.

PJM and MISO staff have been actively pursuing a rigorous technical solution to the PJM-MISO seams issues since mid 2002. Once the MISO markets begin operation, which is currently scheduled for March 2005, it is the market to market protocols that

will be the primary means to ensure that the PJM and MISO markets operate efficiently and are immune from serious gaming concerns.

These protocols involve the real-time exchange of constraint and price information that will allow the RTOs to coordinate in the management of transmission congestion that is affected by load and generation in both areas. This congestion includes transmission constraints on over 300 flowgates in both areas that have been identified by the RTOs. The PJM-MISO joint effort on the seams coordination process has produced three key documents:

1. "The Joint Operating Agreement Between the Midwest Independent System Operator, Inc. and PJM Interconnection". Effective March 1, 2004.
2. "Market to Market Redispatch Coordination: RRO Data Exchange Inception Document", Version 1.3, August 23, 2004.
3. "Midwest ISO & PJM Market–to–Market Interregional Coordination Process," July 18, 2004.

These documents describe the set of operating protocols and procedures, including required changes to each RTO's market software, that will be implemented to effectively manage the seams issues between PJM and MISO. Our evaluation of potential gaming issues in the future is based on an assumption that protocols and procedures described in these documents will be fully implemented prior to the start-up of the Midwest ISO LMP markets.

III. Potential Issues

The primary potential issues along the AEP seam result from electrical interactions, known as loop flows, between AEP and the MISO and PJM market areas. Seams arise

between and among contiguous control areas because electrical networks have the property that power injected at one point and withdrawn at another will flow over all interconnected lines and facilities, including those in multiple control areas. The flow that occurs on others' facilities is generally referred to as "loop flow".

Loop flows can result from transactions that appropriately respond to price signals that accurately reflect the underlying economics of the power system. These loop flows are unavoidable, to some extent, when market-based and non-market based systems interact and thus when congestion is not fully or accurately priced. Loop flows can also result from participants attempting to take advantage of price differences that do not accurately reflect the underlying economics of the power system, by using external contracts to interact with an LMP system.

The physical scheduling of external transactions between RTO areas is generally performed by establishing one or more interface points between the areas. Scheduling over these interfaces however, does not mean that the power will flow over the identified interface points. In reality, the power will flow over the interconnected network as dictated by the physical properties of the network and influenced by the actual source and sink for the power (which are not typically identified in the schedule).

When areas with LMP-based markets are connected to areas without LMP-based markets by more than one interface, participants can schedule transactions over one interface point that will largely flow over other interface points. If attention is not paid to proper pricing of interface transactions, gaming can be facilitated because the prices at each actual physical interface point represent that value of power flowing into or out of the

RTO system at that point, as determined by the LMP model. If scheduled interchange is inconsistent with the actual flow of the power, the prices for an import or export may be similarly inconsistent. In other words, the participant may be paid more for an import (or pay less for an export) than true value of the power based on the points where it actually flows into (or out of) the system.

This inconsistency between the scheduled and actual flows can create a number of gaming opportunities. One example of this type of gaming issue occurred last year in PJM.[1] In response to that issue, PJM developed a more sophisticated implementation of the rules governing the pricing of transactions at interfaces that has largely eliminated gaming-based loop flows. An additional increase in sophistication was required to address the more complex issues raised by the integration of the Northern Illinois Control Area (NICA).

We have been monitoring the protocols and procedures being developed to address seams issues in the Midwest and do not find that significant gaming or efficiency concerns remain for two primary reasons. AEP will be fully integrated into the PJM market as of October 1, 2004, which substantially addresses the numerous concerns that we both raised previously to the Commission. The fact that PJM will be operating LMP markets throughout the AEP territory means that there will no longer be a seam between PJM and AEP.

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1 See the PJM Market Monitoring Unit Report to the Federal Energy Regulatory Commission on Interface Pricing Policy, August 12, 2002.

Additionally, we find that the market-to-market interface protocols and software that is currently under development by PJM and MISO will allow the electrical interactions to be fully reflected in each market's LMPs. As a result of the full integration of AEP into PJM, the AEP generation, transmission and load will be subject to the market to market interface provisions.

Finally, the interface pricing and scheduling provisions to be implemented as part of the market to market interface between the RTOs will eliminate the types of gaming that had previously occurred at PJM interface points.

Hence, we conclude that there are no remaining gaming or other seams issues that require changes to the market rules or other remedies at this time. However, we will continue to work together to monitor the seams to identify issues that may arise in the future. This will be particularly important when the Midwest ISO implements its day-ahead and real-time LMP energy markets in March 2004. If issues arise related to operation of the market to market interface that raise gaming or efficiency concerns, we will promptly notify the Commission and recommend changes to address these issues.

IV. Experience To-Date with the NICA Integration

As a result of prior loop flow related gaming issues, PJM implemented modifications to the manner in which it implements the rules governing prices for transactions over interfaces. [2] In summary, PJM's pre-NICA implementation method for the pricing of

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[2] See the PJM Market Monitoring Unit "Interface Pricing Policy" report to FERC on August 12, 2002 (http://www.pjm.com/markets/market-monitor/downloads/mmu-reports/200208-report-ferc1.pdf). See the PJM Market Monitoring Unit "Interface Pricing Policy" report to FERC on February 28, 2003 (http://www.pjm.com/markets/market-monitor/downloads/mmu-reports/20030301-interface-pricing.pdf).

transactions between PJM and external control areas was to calculate and assign interface pricing points for groups of external control areas. Every external control area was mapped to an interface pricing point. Energy transactions were assigned the interface pricing point to which the external generating control area (GCA) or load control area (LCA) was mapped. The interface pricing points are weighted averages of actual bus prices in the LMP model that are outside the PJM system and that accurately reflect the distribution factor effect of a transaction from the external area on the PJM system.

With the integration of the Northern Illinois (NI) control area into PJM, it was necessary to add to the current set of interface pricing points and to further increase the sophistication with which the interface pricing rules were implemented. As a result of the fact that energy flows from an external control area have different impacts on the NI and PJM control areas, each external control area maps to one interface pricing point with respect to the NI CA and a separate interface pricing point with respect to the PJM CA. For example, an import from AEP impacts the NI and PJM control areas differently. Therefore, there is an interface pricing point for an AEP import to the NI CA, AEPNI, and a separate interface pricing point for an AEP import to PJM CA, AEPVPIMP.

The use of interface pricing points allows two energy transactions with identical physical flow, or generating control area (GCA) and load control area (LCA) pair, to receive the same price regardless of contract path. A pre-ComEd Integration example is an import to PJM from FirstEnergy (FE). This import receives the same pricing point, FE, whether scheduled "FE-AEP-PJM" or a "FE-PJM." The same logic extends to the post-ComEd Integration. For example, an energy transaction from MEC to the PJM CA will receive the same price whether scheduled "MEC-CE-AEP-PJM" or "MEC-IP-AEP-PJM."[3]

In summary: (1) The pricing for external energy transactions with identical GCA and LCA is consistent regardless of contract path. (2) Each NERC control area is mapped to one interface pricing point for NI CA and one interface pricing point for PJM CA. (3) Pricing points are assigned based on the GCA and LCA of the NERC Tag for the energy transaction per the mapping described in "2" above.

The attached Figures present data from the relevant interfaces between PJM and AEP, and NICA and AEP. The Actual minus Scheduled Flow Charts (A-S) show the difference between actual MW flows at the identified interfaces and the scheduled MW flows at those interfaces. If the actual flow were equal to the scheduled flow, this difference would be zero.

The pattern of actual versus scheduled flows for each interface point has changed little over the period. In contrast, when PJM experienced interface price gaming issues in 2002 and 2003 the actual versus scheduled flows showed significant changes.

The Actual Volume Chart shows the actual flow component of the A-S charts for each interface. Positive values represent import volume and negative values represent export volume. There are generally exports from NICA to AEP at the AEPNI interface and imports from AEP at the AEPVP interface.

The Scheduled Volume Chart shows the scheduled flow component of the A-S charts. Positive values represent import volume and negative values represent export volume. This chart shows the flow volume as it was scheduled by market participants. Consistent with the actual chart, we see that flow is generally scheduled "out" at AEPNI and "in" at AEPVP.

The LMP Chart shows the LMP for three interface pricing points – AEPNI, AEPVPEXP and AEPVPIMP.

IV. Conclusions

We have reviewed the interface between AEP and PJM and AEP and MISO and have found no significant gaming issues. We conclude that there are no remaining gaming or other seams issues that require changes to the market rules or other remedies at this time. However, we will continue to work together to monitor the seams to identify issues that may arise in the future. If issues arise related to operation of the market to market interface that raise gaming or efficiency concerns, we will promptly notify the Commission and recommend changes to address these issues.

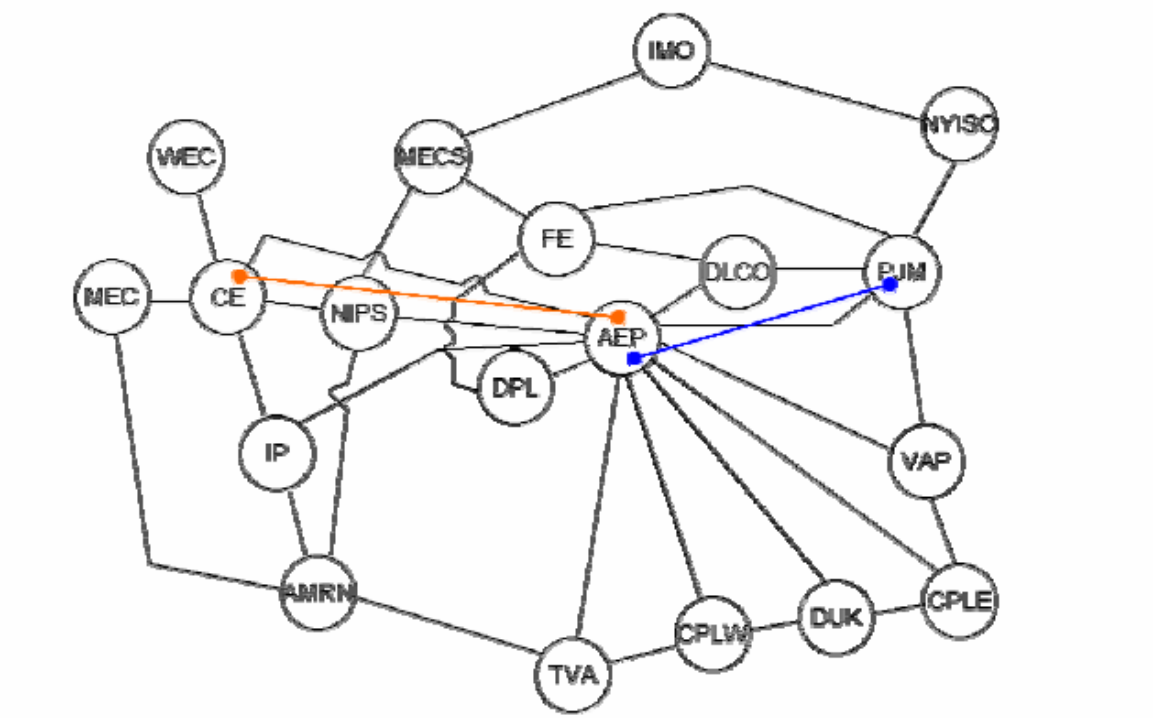
Respectfully submitted,

Joseph E. Bowring
David B. Patton

APPENDIX: PJM PRICING POINT EXAMPLES

Note: For the purpose of these examples, the NI Control Area will be referred to as "CE" due to the fact that it shall retain the NERC acronym "CE" with its integration into the PJM markets.

Example Group 1: Simple Imports to PJM / CE Graph

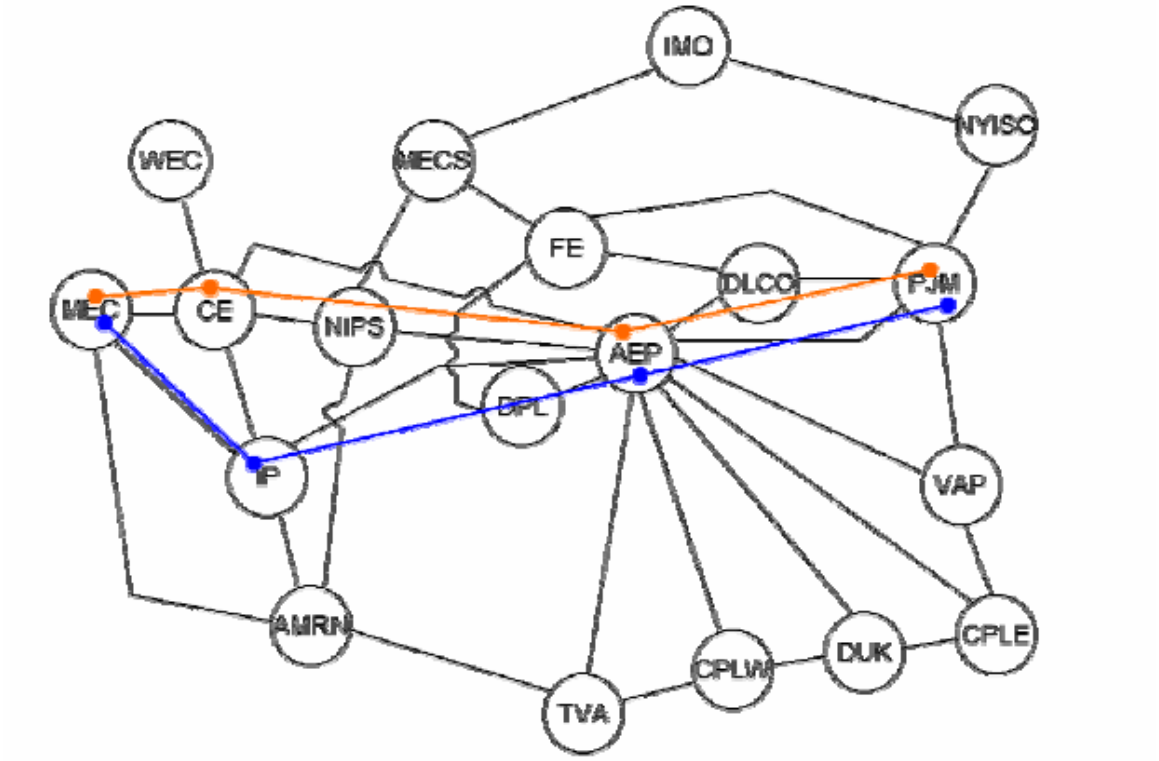


Assumptions
1. Physical flows will flow either to PJM or CE

Example 1: AEP-CE
Description: This schedule represents a simple import to CE
Applicable Pricing Point = AEPNI
Segment Import Pricing Point Export Pricing Point
Import to CE AEPNI

Example 2: AEP-PJM
Description: This schedule represents a simple import to PJM
Applicable Pricing Point = AEPVPIMP
Segment Import Pricing Point Export Pricing Point
Import to PJM AEPVPIMP

Example Group 2: West Pricing Group to PJM Graph

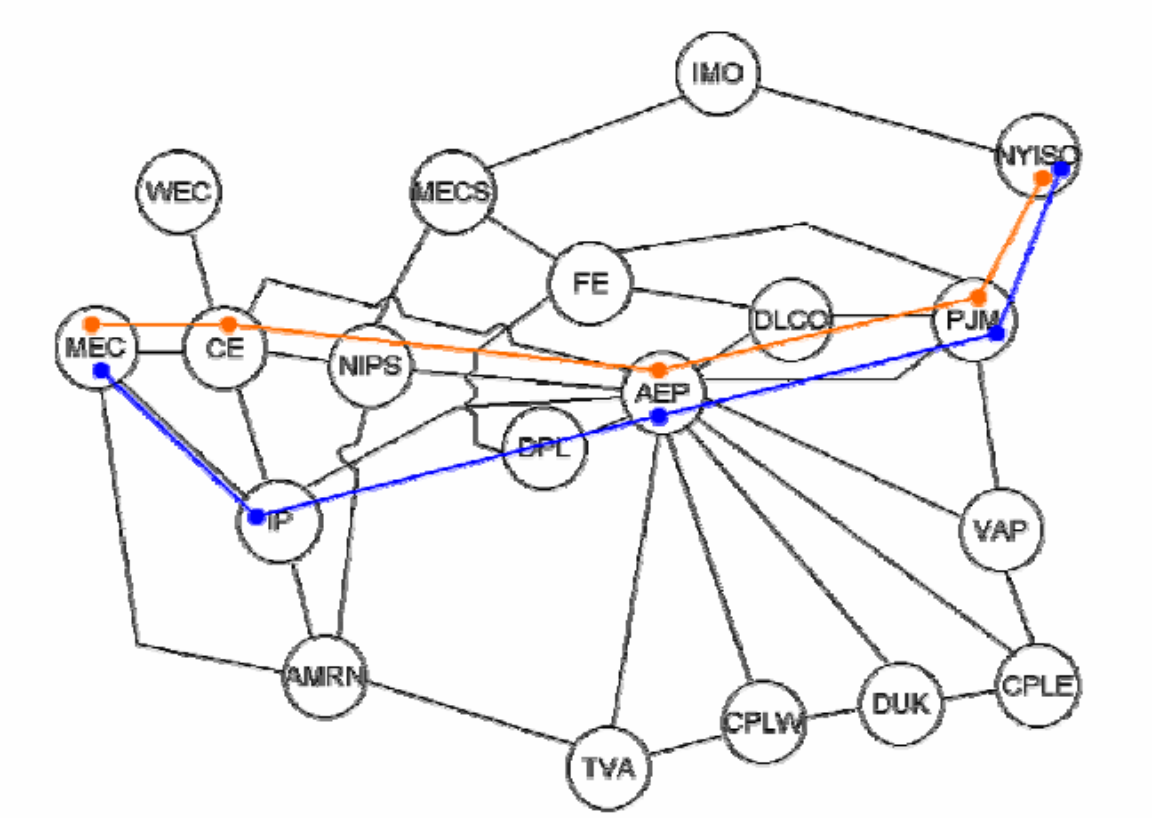


Assumptions
1. Physical flows will flow thru CE and PJM
2. PJM will charge congestion thru both CE and PJM
3. MECPJMIMP Pricing Point = [MEC – AEPNI + AEPVPIMP]

Example 1: MEC – CE – AEP – PJM
Description: This schedule represents a wheel through CE and import to PJM
Applicable Pricing Point = MEC – AEPNI + AEPVPIMP
= congestion through CE + Import to PJM
Segment Import Pricing Point Export Pricing Point
Wheel through CE MEC AEPNI
Import to PJM AEPVPIMP n/a

Example 2: MEC – IP – AEP – PJM
Description: This schedule represents an import to PJM and circumventing the CE control area
Applicable Pricing Point = MECPJMIMP = MEC – AEPNI + AEPVPIMP
= congestion through CE + Import to PJM
Segment Import Pricing Point Export Pricing Point
Import to PJM MECPJMIMP n/a

Example Group 3: Wheels through PJM and CE Graph

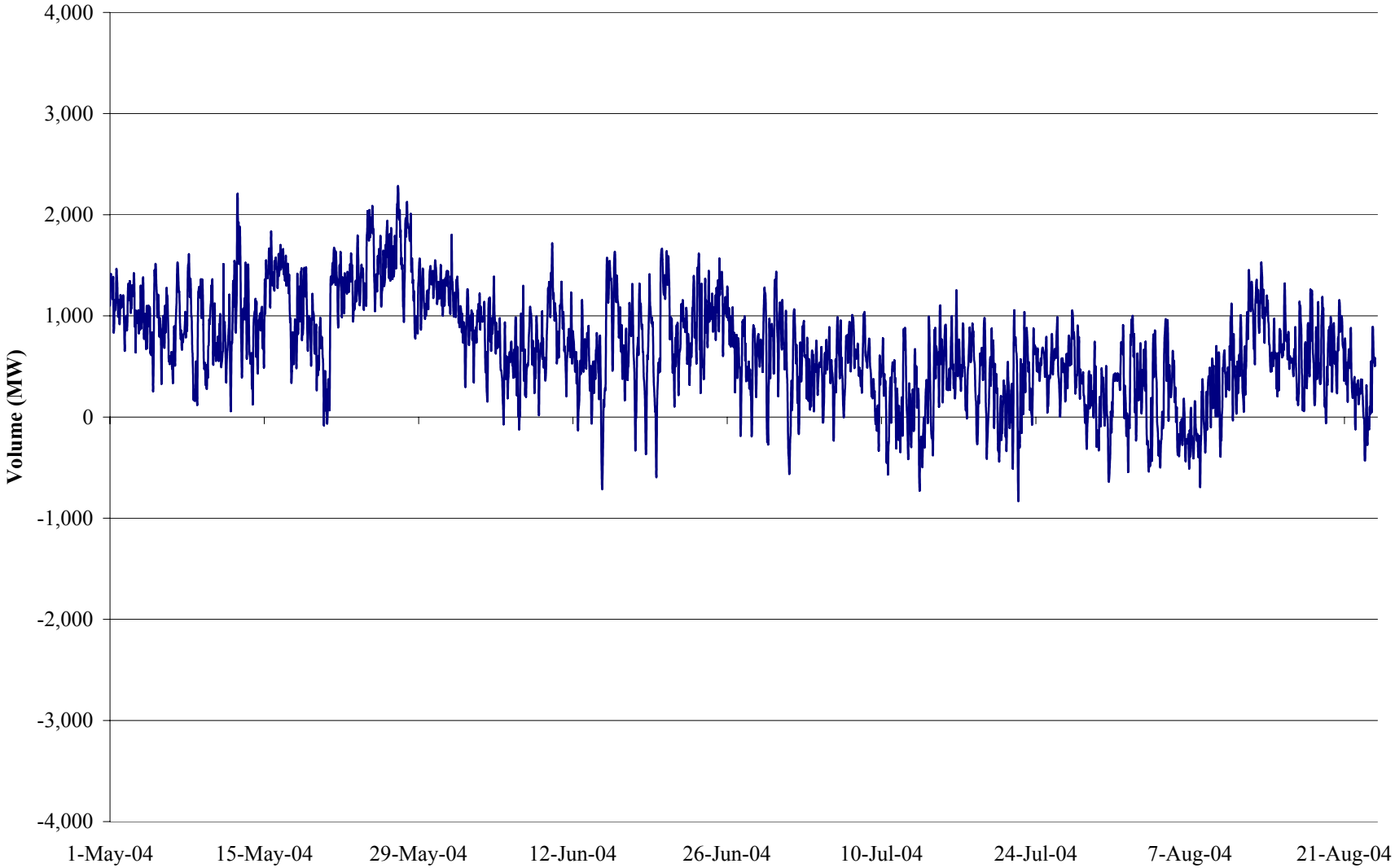


Assumptions
1. Physical flows will flow thru both CE and PJM
2. PJM will charge congestion thru both CE and PJM
3. MECPJMIMP Pricing Point = [MEC – AEPNI + AEPVPIMP]

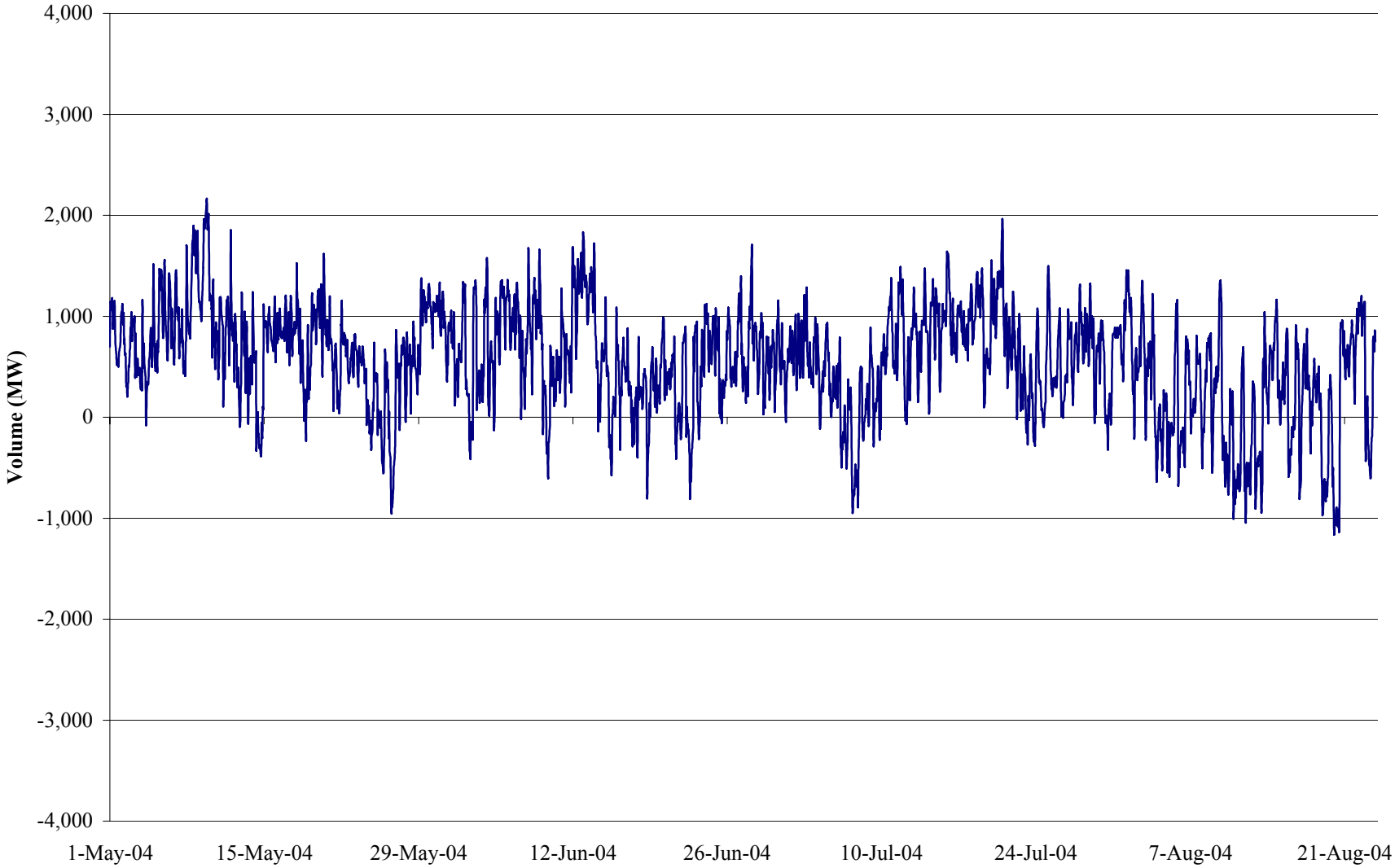
Example 1: MEC – CE – AEP – PJM – NYISO
Description: This schedule represents a wheel through PJM and a wheel through CE
Price Charged = MEC – AEPNI + AEPVPIMP – NYIS
= congestion through CE + congestion through PJM
Segment Import Pricing Point Export Pricing Point
Wheel through CE MEC AEPNI
Wheel through PJM AEPVPIMP NYIS

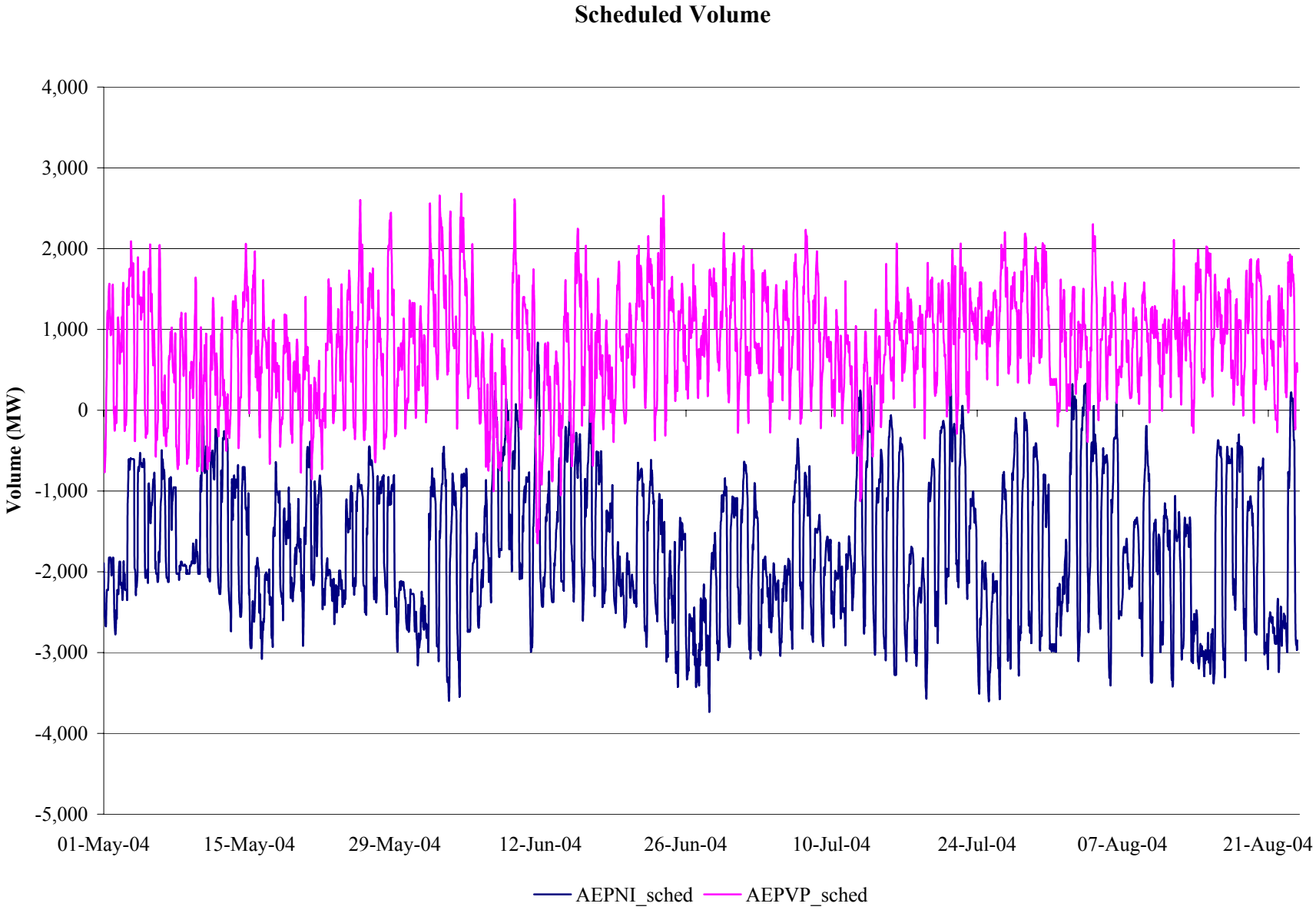
Example 2: MEC – IP – AEP – PJM – NYISO
Description: This schedule represents a wheel through PJM only
Price Charged = MECPJM – NYIS = MEC– AEPNI + AEPVPIMP – NYIS
= congestion through CE + congestion through PJM
Segment Import Pricing Point Export Pricing Point
Wheel through PJM MECPJMIMP NYIS

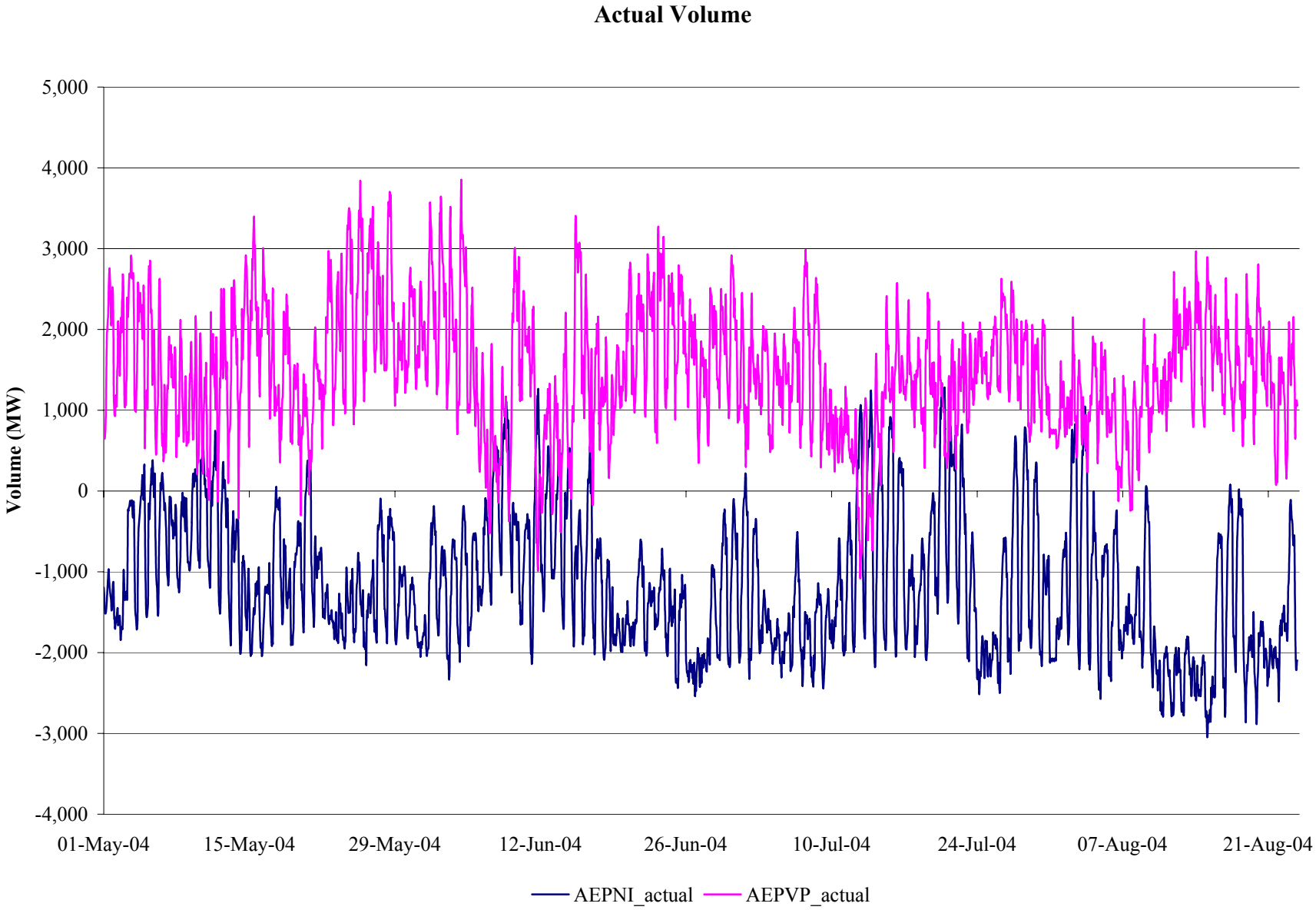
AEPVP A-S


4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
Volume (MW)
1-May-04
15-May-04
29-May-04
12-Jun-04
26-Jun-04
10-Jul-04
24-Jul-04
7-Aug-04
21-Aug-04

AEPNI A-S


4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
Volume (MW)
1-May-04
15-May-04
29-May-04
12-Jun-04
26-Jun-04
10-Jul-04
24-Jul-04
7-Aug-04
21-Aug-04


Scheduled Volume
Volume (MW)
4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
-5,000
01-May-04
15-May-04
29-May-04
12-Jun-04
26-Jun-04
10-Jul-04
24-Jul-04
07-Aug-04
21-Aug-04
AEPNI_sched
AEPVP_sched


Actual Volume
Volume (MW)
5,000
4,000
3,000
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
01-May-04
15-May-04
29-May-04
12-Jun-04
26-Jun-04
10-Jul-04
24-Jul-04
07-Aug-04
21-Aug-04
AEPNI_actual
AEPVP_actual

Locational Marginal Price