ATTACHMENT V

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc.	)	Docket No. ER01-3155-000
	)	
Consolidated Edison Company of New York, Inc.	)	Docket Nos. ER01-1385-001 and EL01-45-001
	)	

AFFIDAVIT OF JAMES H. SAVITT, PH.D.

Town of Schenectady :
: ss:
County of Schenectady :

1. My name is James H. Savitt. I am presently employed as the Market Monitor for the New York Independent System Operator, Inc. ("NYISO"). My business address is 3890 Carman Road, Schenectady, New York 12303. I am responsible for reviewing and analyzing the bidding and offering behaviors of participants in the NYISO-administered electricity markets, with particular concern for detecting instances of anomalous bidding that affect the markets, and for carrying out mitigation actions as may be warranted.

2. To accomplish that task, I administer and implement the NYISO's Market Monitoring Plan ("Plan"), the NYISO's Market Mitigation Measures (Appendix H to the NYISO Market Administration and Control Area Services Tariff) ("Market Mitigation Measures"), the Automated Mitigation Procedure ("AMP"), which automates certain aspects of the Market Mitigation Measures, and the current market mitigation measures for the New York City Day-Ahead Market ("In-City DAM"). I participated in the development of both the AMP and the refinements to the AMP proposed for

implementation in this filing. Thus, I have detailed knowledge of the design of the Market Mitigation Measures, the AMP, and the way in which all of the features of market mitigation administered by the NYISO operate.

3. I am also intimately familiar with, and responsible for, the implementation of the mitigation measures for New York City ("ConEd Measures") first approved in Docket No. ER98-3169-000 by the Federal Energy Regulatory Commission in connection with the divestiture of certain generating units by Consolidated Edison Company of New York, Inc. ("ConEd"). The ConEd Measures are administered by the NYISO in accordance with Section 5.1 of the Market Mitigation Measures.

4. This affidavit addresses five issues. First, as the Commission requested in its November 27 Order on Motions Requesting Extension of the Revised Localized Mitigation Measures ("ConEd Order") in docket numbers ER01-1385-001 and EL01-45-001, I provide a report on the performance of the day-ahead ConEd Measures for the period June through November 2001. Second, I address the appropriateness of one component of those measures: the 105% mitigation trigger, which the NYISO is proposing to change. Third, I address the implementation of the Real-Time In-City[1] Mitigation for the 2002 Summer Period. Fourth, as the Commission requested in its November 27 Order Approving Extension of Automatic Mitigation Procedures Subject to Conditions ("NYISO AMP Order") in docket number ER01-3155-000, I provide a report on the exemption of non-hydro Energy Limited Resources ("ELRs") in the AMP. Fifth, I describe the NYISO's plans to adjust reference levels for In-City units.

[1] Capitalized terms used in this affidavit but not defined herein have the meaning given to them in the NYISO Market Administration and Control Area Services Tariff.

The Summer 2001 Experience

5. The Commission's order approving the ConEd Measures applied to the three In-City asset bundles which were the subject of ConEd's divestiture. The ConEd Measures contain specific mitigation rules covering energy, startup, and minimum generation bids in the In-City DAM, as well as other restrictions that I do not address here. The rules for the mitigation of energy bids provide for mitigation of a unit's bids when the LBMP at the unit's bus exceeds the LBMP at the Indian Point 2 ("IP-2") bus by 5% or more.

6. Since the commencement of the NYISO's operations in November 1999, market participants have voiced concern that the frequency of In-City DAM mitigation may be unduly high.

7. To evaluate this concern, I oversaw and reviewed an extensive data collection. I focused on the bid load pass of the security constrained unit commitment ("SCUC"), the NYISO software that evaluates bids in the day-ahead market ("DAM") and commits units based on their economic ranking, because that is the point at which the In-City DAM mitigation occurs. The data included In-City unit-by-unit mitigations, commitments, and schedules that are part of the SCUC process. My staff and I developed a series of charts from the data, which are attached to this affidavit as Exhibits 1 through 12, to illustrate the conclusions I have drawn concerning the functioning of the In-City DAM energy mitigation measures.

8. Exhibits 2-7 depict the total megawatts ("MW") of capacity In-City for the period June 1, 2001 through November 30, 2001. As noted above, the In-City market for this period included both units that were subject to the local mitigation measures and other units that were not subject to such mitigation. My analysis focuses on the MW bid into

the In-City DAM by the former group in order to illustrate the effects of the mitigation. However, the Exhibits show all five categories of bidders:

a. MW subject to mitigation that were committed and mitigated;

b. MW subject to mitigation that were committed and not mitigated;

c. MW not subject to mitigation and committed;

d. MW subject to mitigation that were not committed; and

e. MW not subject to mitigation and not committed.

9. I note that for September and October of 2001, all units were made subject to the In-City DAM mitigation, resulting in only three categories of bidders, as shown in Exhibits 5 and 6.

10. The fraction of the total In-City capacity that was actually committed in the DAM during each of these months was about 75% as shown in Exhibits 2-7. This amounts to between 4,300 and about 8,000 MW accepted at the peak hour every day, with the variations dependent largely on the weather. Exhibit 1 shows the MW committed and mitigated.

11. I found that, prior to the expansion of the mitigation measures in September and October, approximately 25% of the In-City capacity (30% in June, 23% in July, and 26% in August) was committed and mitigated on any one day. (*See* Exhibits 2-4.) At the same time, approximately 20% of the total MW subject to the mitigation rules was committed and <u>not</u> actually mitigated. This means that competitively bid MW subject to mitigation made up almost one-fifth of the energy bid in to the market.

12. Another way to view the data is to consider the relative sizes of the mitigated and unmitigated MW fractions committed in this period. While in June the number of

mitigated MWs was nearly twice the number of unmitigated MWs, in July and August these two groups were more balanced. (*See* Exhibit 3.) Thus, while fewer MWs were bid and committed competitively in the June, this number increased in the next two months, and the fraction that was mitigated declined in the same time from a high of 30% of the total MW to a low of 23%.

13. The expansion of the number of units subject to the rules in September and October did not significantly alter the fractions seen in the earlier months. The MWs committed continued to amount to about 75% of the total capacity. In September, the fraction that was not mitigated was approximately one-third of the total while the mitigated portion was just over one-third, at 36% of the total capacity. These fractions shifted slightly relative to each other in October, when the mitigated portion dropped to 22% and the unmitigated portion increased to almost 40 % of the available capacity, representing over half of the total MWs committed.

14. Another way of assessing the extent of In-City DAM mitigation is to consider how many units (rather than MW) were committed and mitigated. Originally, there were 95 units subject to mitigation, divided among three owners. In September and October 2001, the number of units subject to mitigation increased to 121 (across seven owners). Exhibit 8 shows a clear pattern of four to eight units – mostly steam units – being committed and mitigated for most days. Thus, on days when loads were at average levels, mitigation affected only a small number of units. On higher load days, the number of units mitigated jumped to the thirty to fifty range, as shown in Exhibit 8. This increase probably represents commitments of combustion turbines needed to meet those higher loads. Even so, fewer than half the total units that were subject to mitigation actually

incurred mitigation.

15. These data suggest that, while the ConEd Measures were imposed on some fraction of the energy committed in the DAM, an equivalent or larger portion of the total MW that was subject to mitigation was competitively bid and not mitigated.

The 105% Congestion Trigger

16. I also sought to determine whether the 105% trigger was set appropriately to assure that mitigation was taking place only in the presence of congestion. As a result of the analysis described below, I have concluded that the Indian Point 2 trigger should be changed from 5% to 7%. My recommendation is based on the relative size of losses between the IP-2 bus and the Arthur Kill 2 ("AK2") bus, which is representative of the 138 kV system, and relative losses between the IP-2 bus and the Arthur Kill 3 ("AK3") bus, which represents the 345 kV system.

17. My approach to the analysis was to understand the size and extent of losses into New York City relative to the LBMPs at the IP-2 bus. A large and frequently-occurring loss component of the LBMP would provide support for a decision to change the trigger to remove the effect of losses.

18. Because of the unavailability of certain pre-mitigation interim data in the SCUC process, I measured post-mitigation losses against the IP-2 bus. Specifically, I measured the losses between IP-2 and either AK2 or AK3 as a percentage of the IP-2 bus LBMP for the 170+ observations available for each hour of the day. I applied standard statistical techniques to determine whether the variability in the numbers was likely to represent losses. Means, standard deviations, and coefficients of variation (relative dispersion) are the logical statistics to generate in this process.

19. The primary conclusion from the analysis is that losses to AK-2 average 1.24% of the IP-2 LBMP and losses to AK-3 average 1.3% of the IP-2 bus. Moreover, except for hour-beginning 16 at the AK2 bus, all of the losses hour-by-hour to the two busses averaged over 1% of the IP-2 LBMP. An assumption of normality for the distribution of losses allows one to conclude that approximately 95% of the observations for AK2 losses were between .56% and 1.92% of the IP-2 LBMP. Similarly for AK3, approximately 95% of the observations showed losses to be between 1.08% and 1.52% of the LBMP. Since the trigger for mitigation under the existing measures is 5%, the mean losses represent approximately ¼ of the trigger. This fraction is large enough to undermine confidence in the assumption that mitigation under the In-City measures occurred only when there was congestion.

20. Exhibits 9 and 10 also show the extent of the losses relative to the IP-2 bus overall and on an hour-by-hour basis using available the pre-mitigation data. These confirm my conclusion that losses approached 1/4 of the trigger. In the vast majority of hours for the two busses under consideration, losses were greater than 1% at least half of the time. In fact, for the 345 kV system the 1% figure was exceeded 82% of the time, while for the 138 kV system the comparable figure is 59%. Looking at the off-peak hours, the figure for the 138 kV system approaches 80%, while the figure for the 345 kV system rises to 90%.

21. One can draw a number of conclusions from an examination of the data. First, a juxtaposition of Exhibits 1, 8, 9, and 10 indicates that the frequency and extent of mitigation under these measures may well be related to the fact that losses are quite consistently a significant proportion of the difference between the IP-2 LBMP and that of

an In-City bus. A corollary is that in off-peak periods when congestion would be expected to be light and loads low, losses continued to play a role in pushing In-City LBMPs above the IP-2 LBMP. In off-peak hours, the data from Exhibits 9 and 10 show that not only is the mean loss percentage large (1.8% for AK2 and 1.4% for AK3), but also that losses greater than 2% of the IP-2 LBMP are very frequent. In the case of the 138 kV system, losses exceeded 2% of the IP-2 LBMP in off peak hours in an average of 82 of the 170+ observations for each hour. That 2% proportion amounts to 2/5 of the 5% trigger.

22. Exhibits 11 and 12 are loss duration curves for hour-beginning zero and hour-beginning sixteen for the two busses. These are graphic alternatives to the information in Exhibits 9 and 10. The curves map the loss factor against the observations to show how many of the observations are associated with a loss factor greater than some percent. The right-side ends of the curves indicate that relatively few of the observations have very small loss factors: in hour zero for example, losses were less than ½% of the IP-2 LBMP on only 5-15 days. Thus, for the vast majority of observations, losses exceed 1% of the IP-2 LBMP, or 1/5 of the 5% trigger window.

23. These data suggest that losses can be a pervasive factor in the In-City mitigation process pursuant to the ConEd Measures when congestion is less than 5%. The frequency of losses above 1% and the nature of the distribution of the mean loss percentage show that the numbers are robust enough statistically to conclude that there is a risk that mitigation may occur as a result of losses rather than congestion. In order to minimize this possibility, I calculated a bound around the mean loss percentage using the upper side of a two-standard deviation band. Virtually all of the losses to the 138 kV and

to the 345 kV systems would fall within this band, which I calculated to be approximately 1.92% of the IP-2 LBMP. Thus, the NYISO proposes that the 5% trigger for In-City DAM mitigation be increased to 7%, which represents the sum of 5% and 1.92%, rounded up to the nearest whole number. This modification to the In-City Day Ahead measures will help assure that mitigation occurs only in the presence of congestion, and not on the basis of losses.

24. The Market Monitoring Unit will continue to assess the performance of the triggering point to ensure that losses do not play a role in the In-City mitigation process.

Real-Time In-City Mitigation

25. As part of this Comprehensive Market Mitigation filing, the NYISO has detailed its plan to apply Real-Time In-City market mitigation starting May 1, 2002. Initially, the NYISO will use manual procedures, with the complete transition to automated mitigation to be completed by August 31, 2002. The Real-Time In-City mitigation measures will address the unique market power considerations applicable to the Real-Time In-City markets, previously recognized by the Commission.

26. The Market Monitoring Unit has experience performing Real-Time manual mitigation, having performed such mitigation during the 2000 and 2001 Summer Periods. The Market Monitoring Unit is prepared to carry out manual mitigation for the Real-Time In-City markets using the same criteria that the AMP will employ and manually performing the various tasks that the AMP will perform once it is operational. The Market Participants should see little difference in the Real-Time In-City mitigation during the transition from manual mitigation to automated mitigation.

The AMP and Energy Limited Resources

27. The Commission's NYISO AMP Order requested that the NYISO determine if non-hydro ELRs should be exempted from the AMP for the same reasons that the NYISO requested that hydro ELRs be exempted. It is important to understand what this exemption entails. The exemption from the AMP does not exempt the hydro ELRs from mitigation. Rather, the exemption addresses the relative inflexibility of the automated mitigation procedures while recognizing that the volatile bids submitted by non-hydro ELRs are often justified. Hydro ELRs often submit volatile bids related to opportunity costs associated with running the generation during one period as opposed to a different period. For example, a hydro ELR may have a capacity limit that relates to the flow of a river (or lack thereof) or face a constraint due to the amount of water in a lake that limit the amount and duration of the energy available from such a hydro unit. As a result, a decision to run during one period may cause the unit to become unavailable during another period.

28. Non-hydro ELRs, for example a gas turbine with environmental restrictions, may face limits during certain hours of the day, but these units often have flexibility to run within such limitations. Moreover, the non-hydro ELRs often face more certain opportunity costs compared with the opportunity costs of hydro units. As a result, it is possible, after appropriate consultations with the operators of non-hydro ELRs, to establish reference prices for non-hydro ELRs. In contrast, the varying opportunity costs associated with hydro ELRs make calculating reference prices for hydro ELRs much more difficult.

29. The NYISO's Market Monitoring Unit has a track record of working with generation owners, including ELR owners, to understand the specific nature of any unit

and the way in which it is bid so that there is no unjustified AMP mitigation. Moreover, because there are a very limited number of non-hydro ELR units in the New York Control Area, the Market Monitoring Unit has the ability, in consultation with the owners, to calculate suitable Reference Levels for these units.

Reference Curve Adjustments

30. Pursuant to the Plan, the Market Monitoring Unit has the authority and the obligation to develop Reference Levels for all units participating in the New York markets. The methodologies for determining reference levels are specified in Section 3.1.4 of the Market Mitigation Measures. Pursuant to the Commission's order to bring the ConEd provisions into conformance with the Market Monitoring Plan, the NYISO proposes to adjust the current In-City reference formula to incorporate the elements noted in Section 3.1.4 a(3) for units for which there is little or no history of accepted bids, as described in Section 3.1.4a(1).

James H. Savitt, Ph.D.
Market Monitor
New York Independent System Operator, Inc.

Subscribed and sworn to before me this 18th day of March, 2002.

Notary Public

My Commission expires : 9/26/02

LINDA J. MOORE
Notary Public, State of New York
No. 01MO5033807
Qualified in Schenectady County
Commission Expires September 26, 2002

EXHIBIT 1

Daily MW Committed and Mitigated

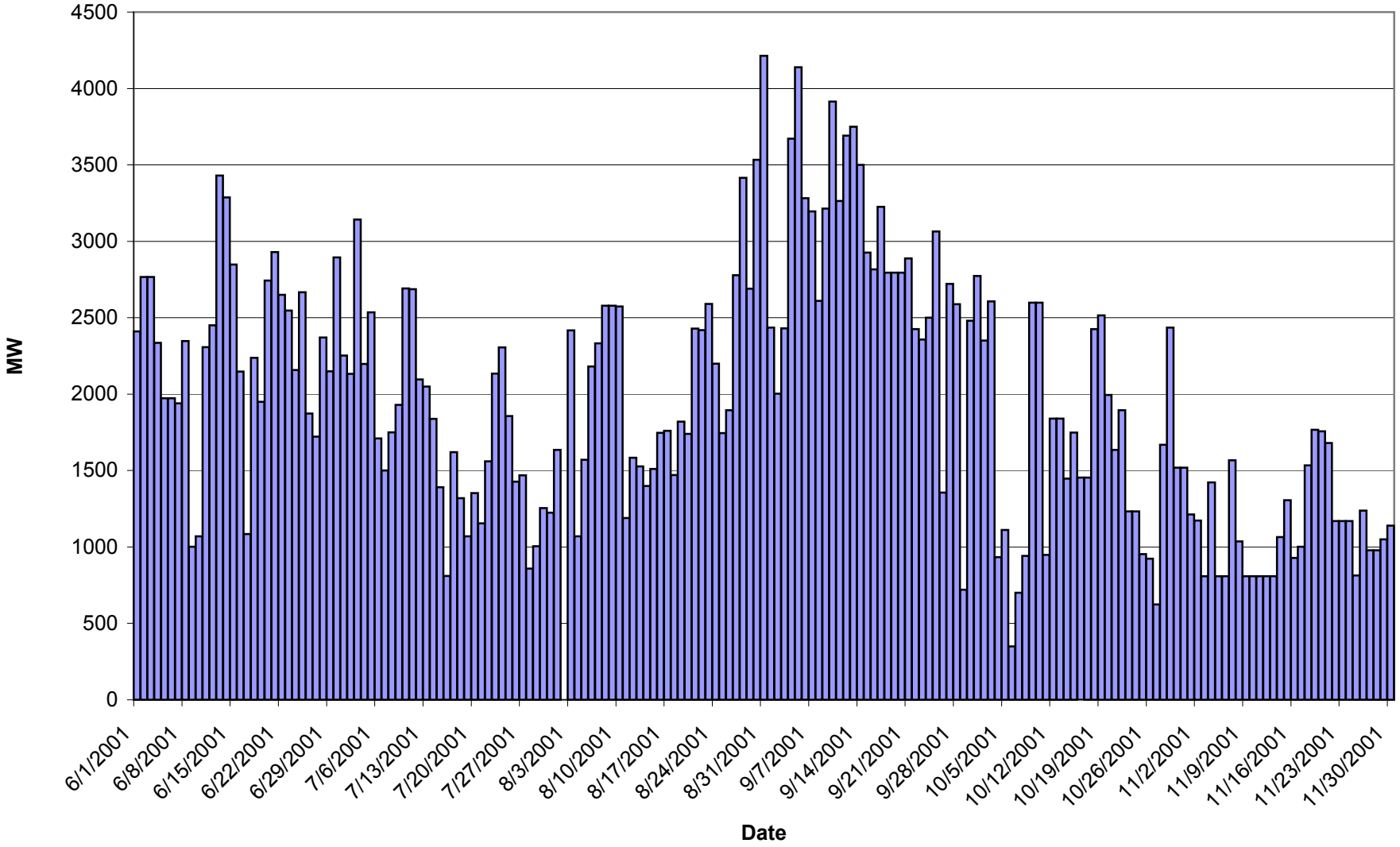


EXHIBIT 2

Total In-City Capacity - Day Ahead Market

June 2001

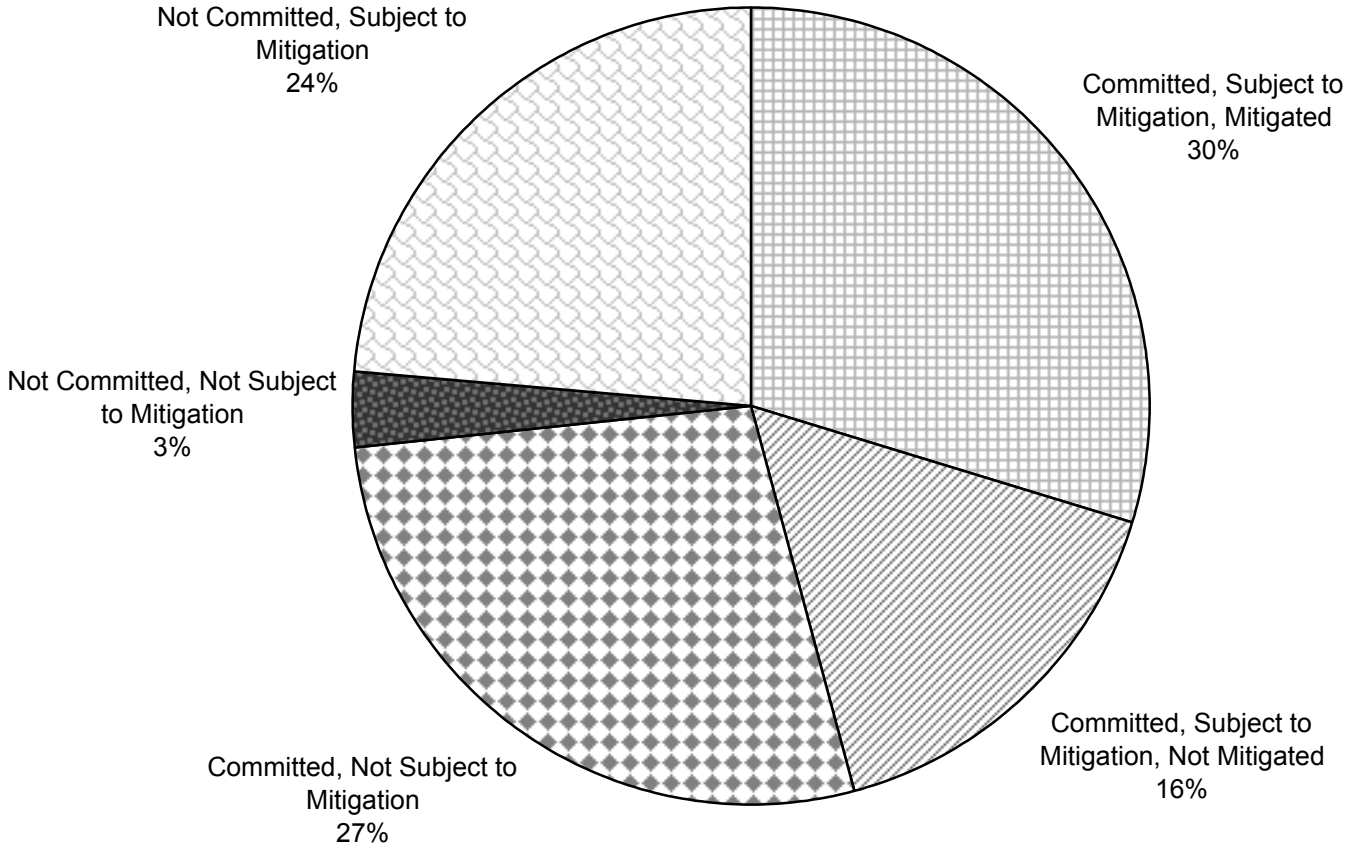


EXHIBIT 3

Total In-City Capacity - Day Ahead Market

July 2001

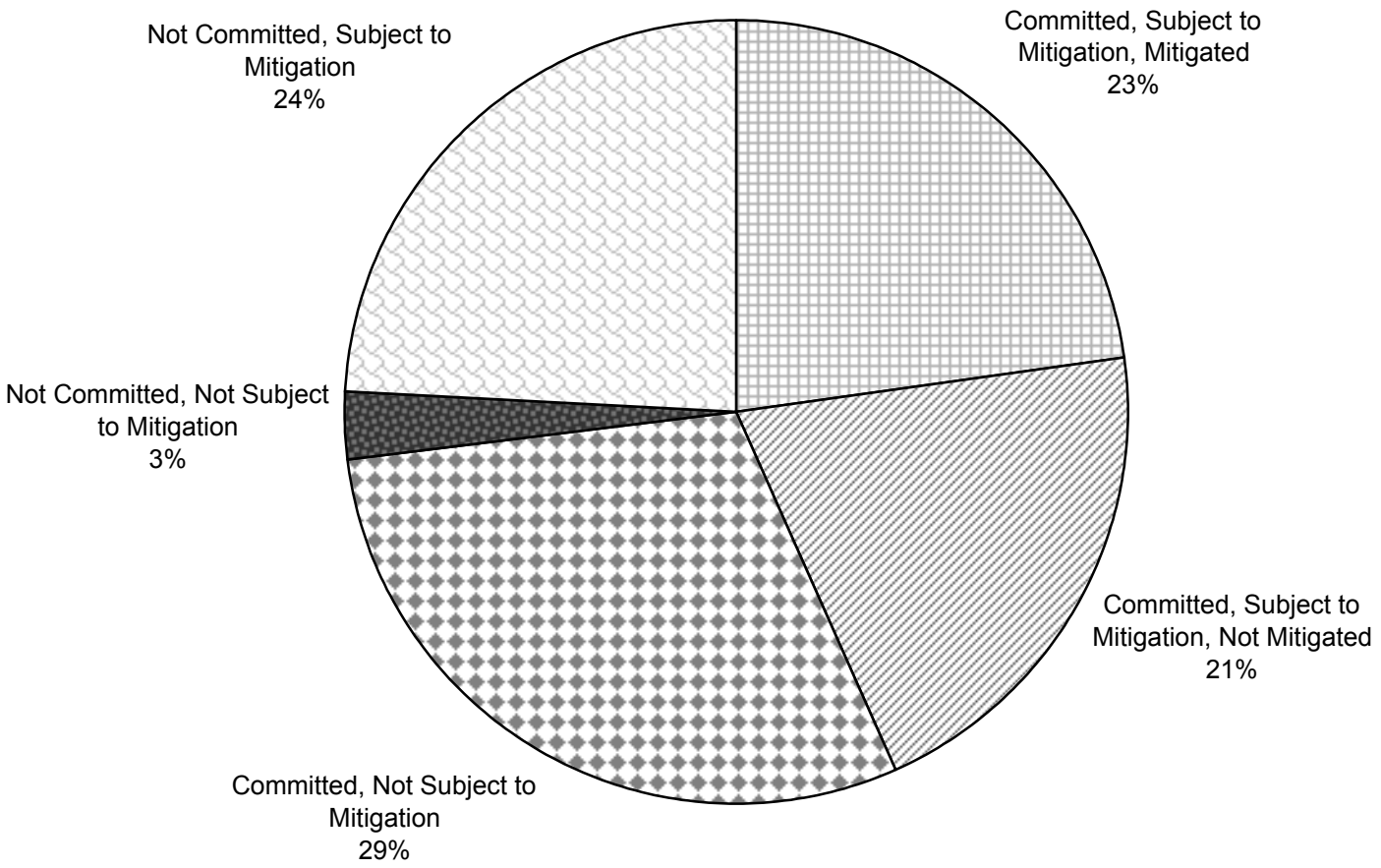


EXHIBIT 4

Total In-City Capacity - Day Ahead Market

August 2001

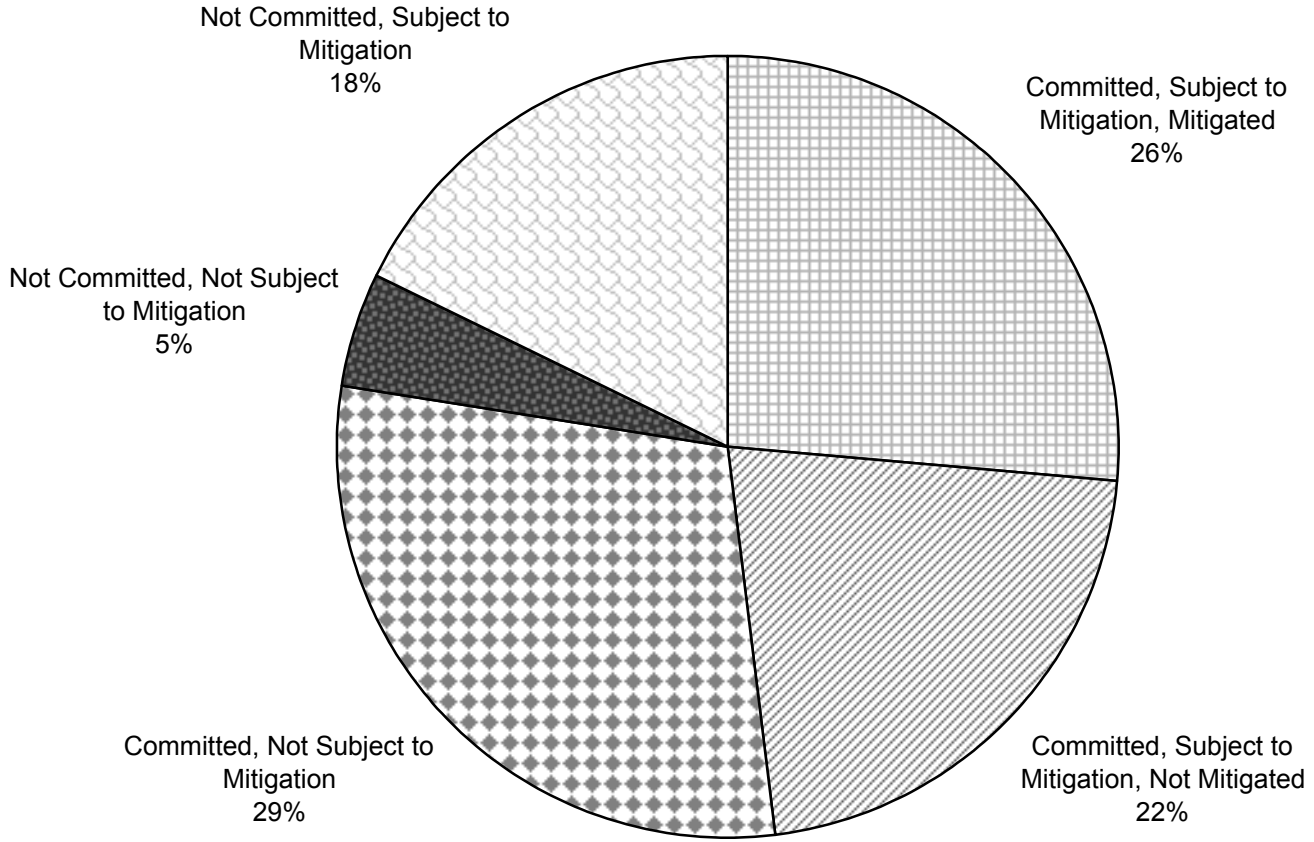


EXHIBIT 5

Total In-City Capacity - Day Ahead Market

September 2001

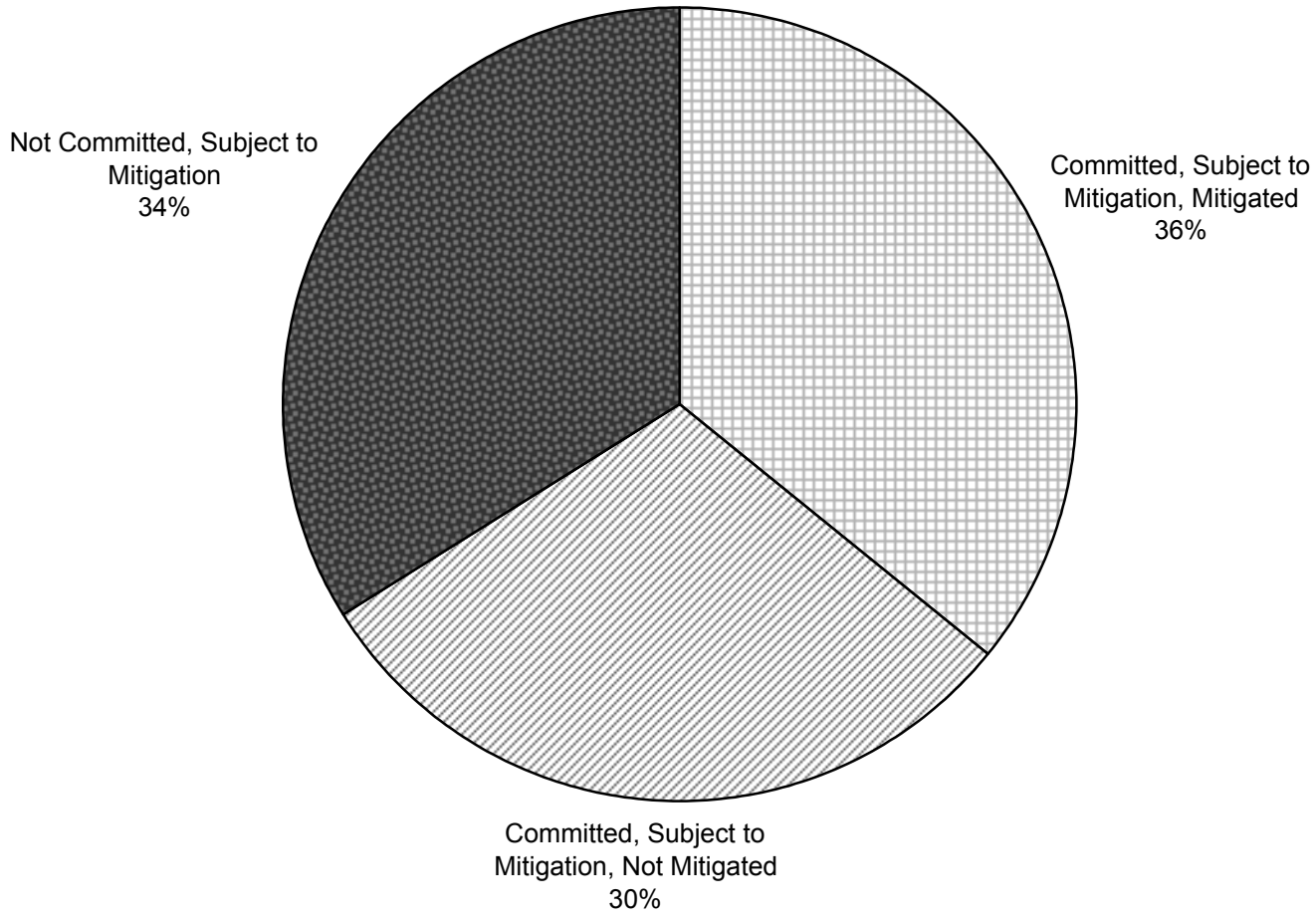


EXHIBIT 6

Total In-City Capacity - Day Ahead Market

October 2001

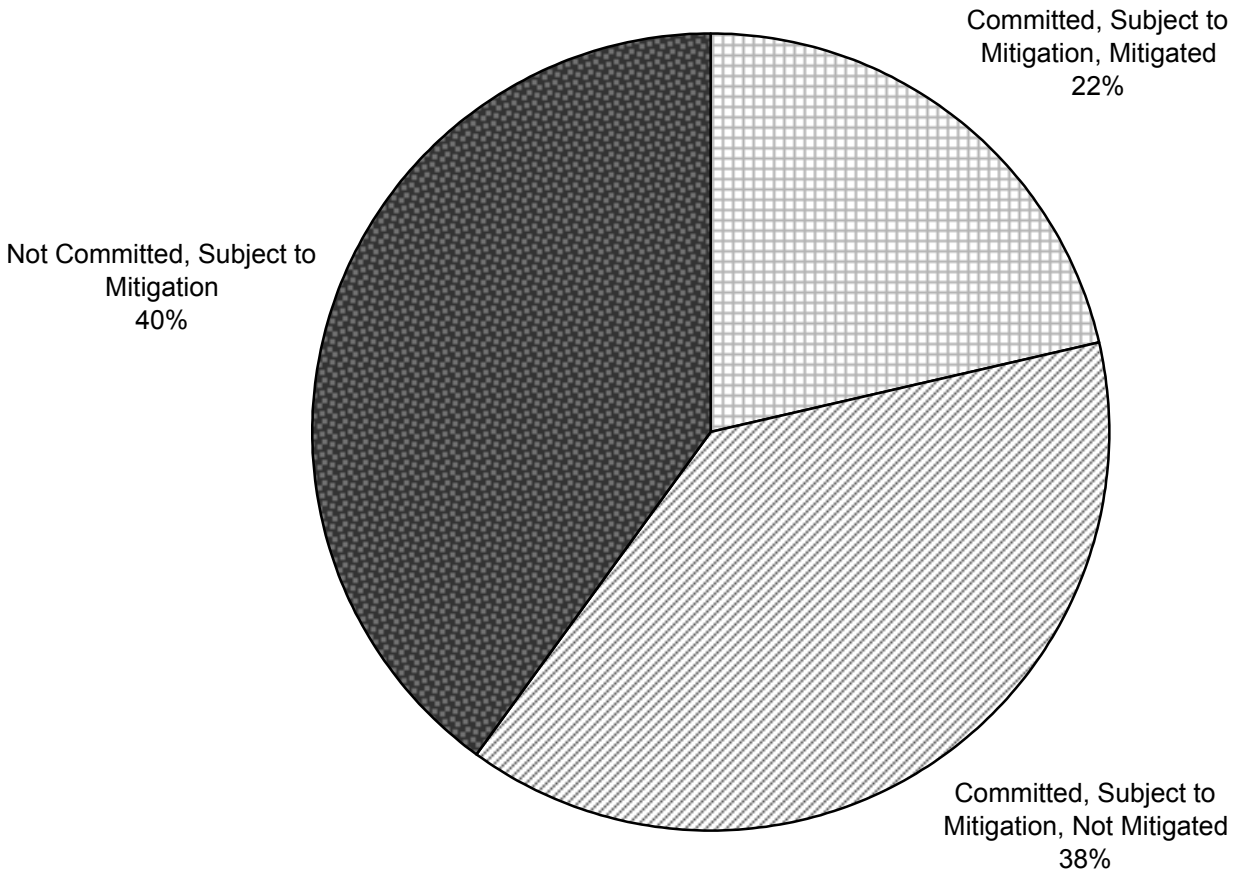


EXHIBIT 7

Total In-City Capacity - Day Ahead Market

November 2001

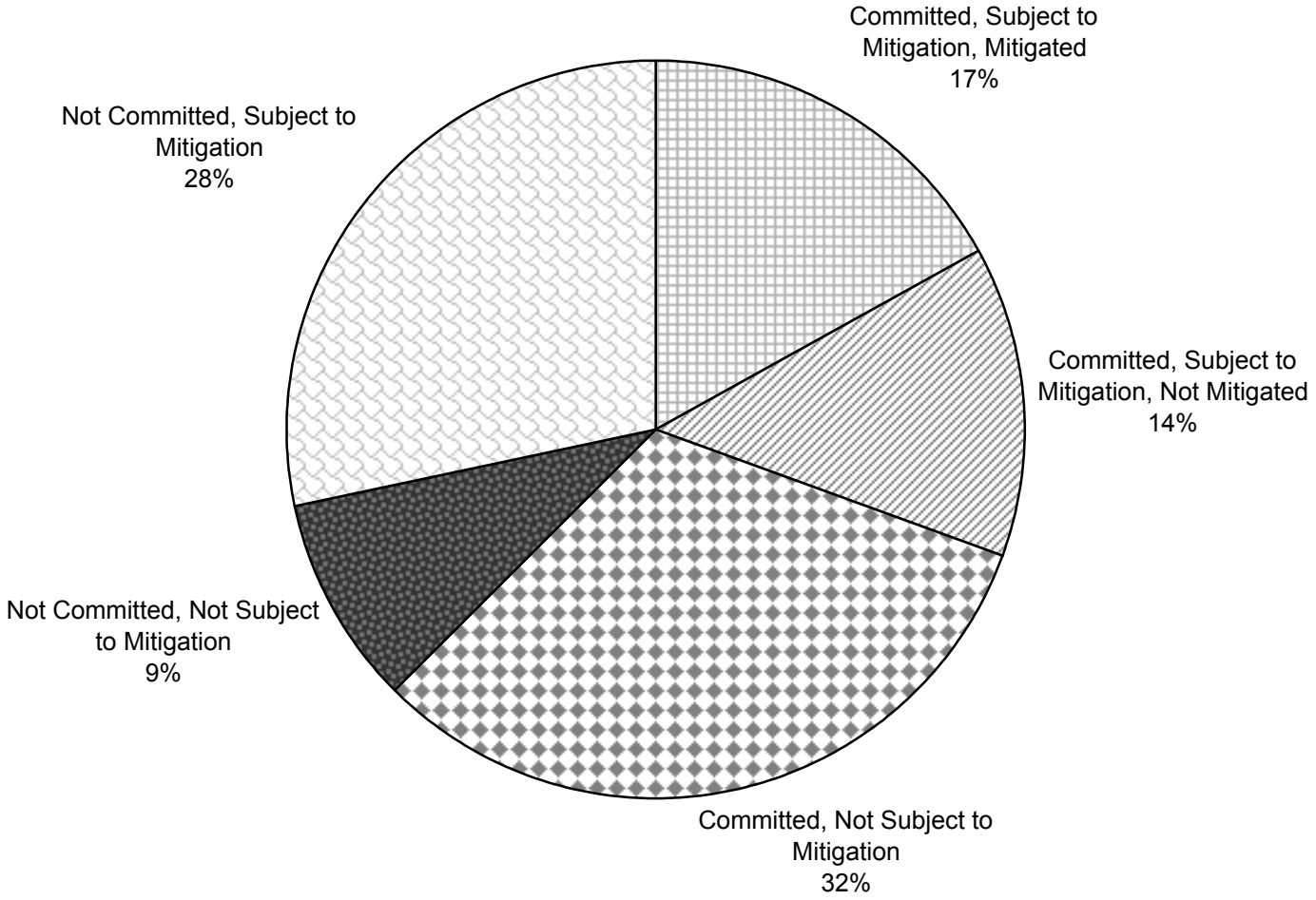
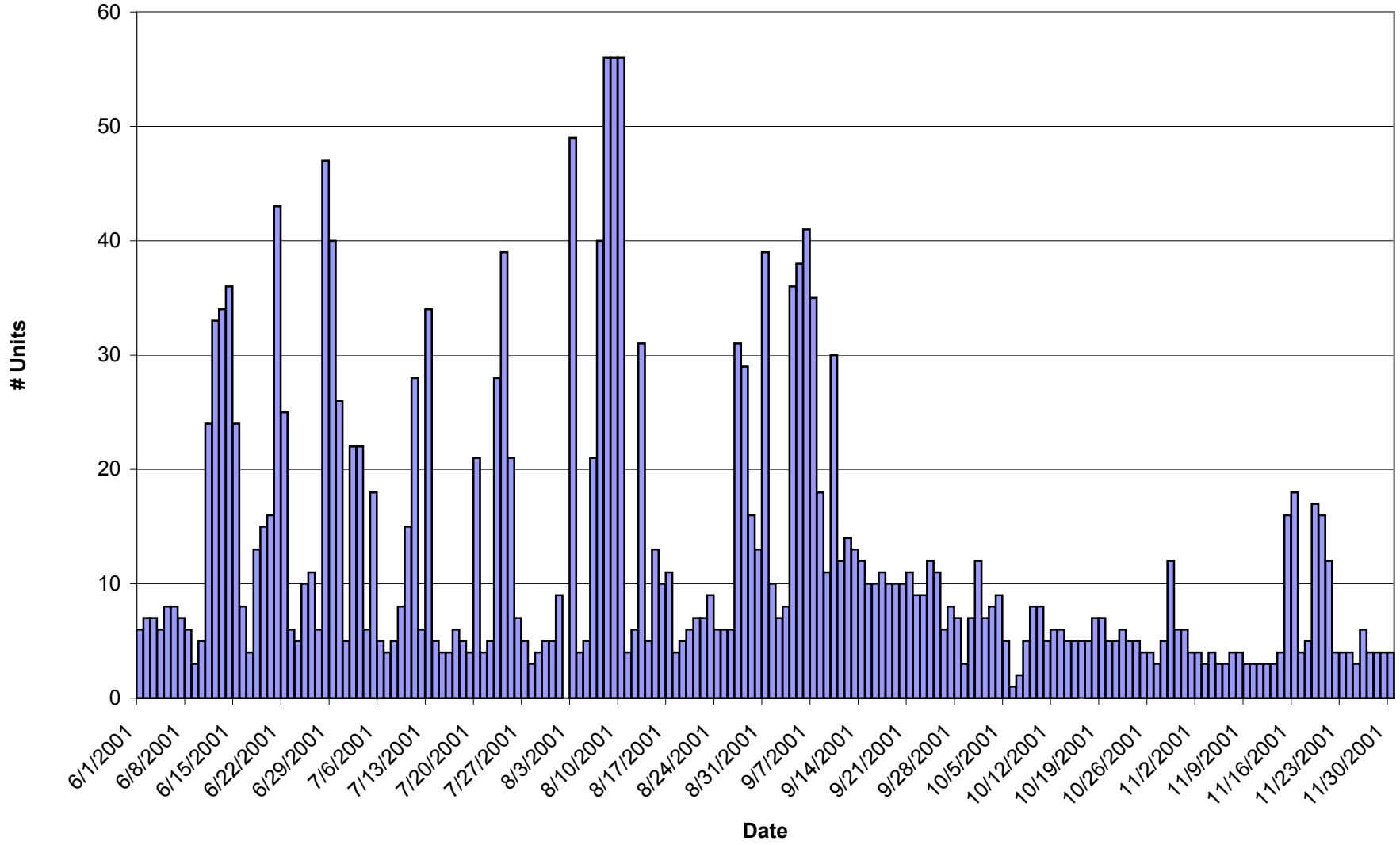


EXHIBIT 8

Number of Units Committed and Mitigated



June 1-August 30: 95 Units Subject to Mitigation
August 31-October 31: 121 Units Subject to Mitigation
October 31-November 30: 95 Units Subject to Mitigation

EXHIBIT 9

Losses from IP2 to Arthur Kill 2

	IP2 Bus	AK2 Mean		Number of Times AK2 Losses are >n% of IP2 Bus LBMP					Loss % Statistics	
Hour	Mean LBMP	Loss Diff	Loss %	>1%	>2%	>3%	>4%	>5%	StdDev	CV
0	28.57	0.50	1.73%	129	76	21	4	1	1.15%	66%
1	25.27	0.47	1.86%	143	95	18	3	1	1.03%	55%
2	23.38	0.44	1.88%	142	93	14	2	1	0.97%	51%
3	22.58	0.43	1.90%	149	96	12	2	0	0.82%	43%
4	22.80	0.43	1.89%	148	98	14	2	0	0.82%	43%
5	25.18	0.41	1.65%	136	73	10	0	0	0.88%	53%
6	29.00	0.40	1.37%	109	55	8	0	0	0.90%	65%
7	35.08	0.46	1.32%	101	43	8	2	0	0.91%	69%
8	39.73	0.45	1.12%	88	32	3	0	0	0.82%	73%
9	43.07	0.49	1.14%	85	30	6	0	0	0.84%	74%
10	46.17	0.53	1.15%	92	32	7	0	0	0.85%	74%
11	49.79	0.55	1.10%	84	31	5	1	0	0.85%	77%
12	51.21	0.55	1.08%	82	28	7	1	0	0.85%	78%
13	54.79	0.56	1.02%	81	25	8	0	0	0.85%	84%
14	57.92	0.60	1.04%	74	26	6	0	0	0.84%	81%
15	58.21	0.60	1.03%	77	26	7	0	0	0.86%	83%
16	59.71	0.59	0.98%	74	25	5	0	0	0.83%	85%
17	54.96	0.56	1.02%	73	25	4	0	0	0.81%	79%
18	50.61	0.52	1.03%	72	25	3	0	0	0.76%	74%
19	47.48	0.49	1.04%	65	28	2	0	0	0.78%	75%
20	45.32	0.49	1.08%	80	26	2	0	0	0.78%	72%
21	42.56	0.54	1.26%	95	39	10	0	0	0.90%	72%
22	36.57	0.58	1.59%	123	61	18	1	0	0.97%	61%
23	32.11	0.52	1.63%	130	65	21	2	0	1.01%	62%
Average	40.92	0.51	1.24%	101	48	9	1	0		
StdDev	12.51	0.06	0.34%							
CV	31%	12%	27%							

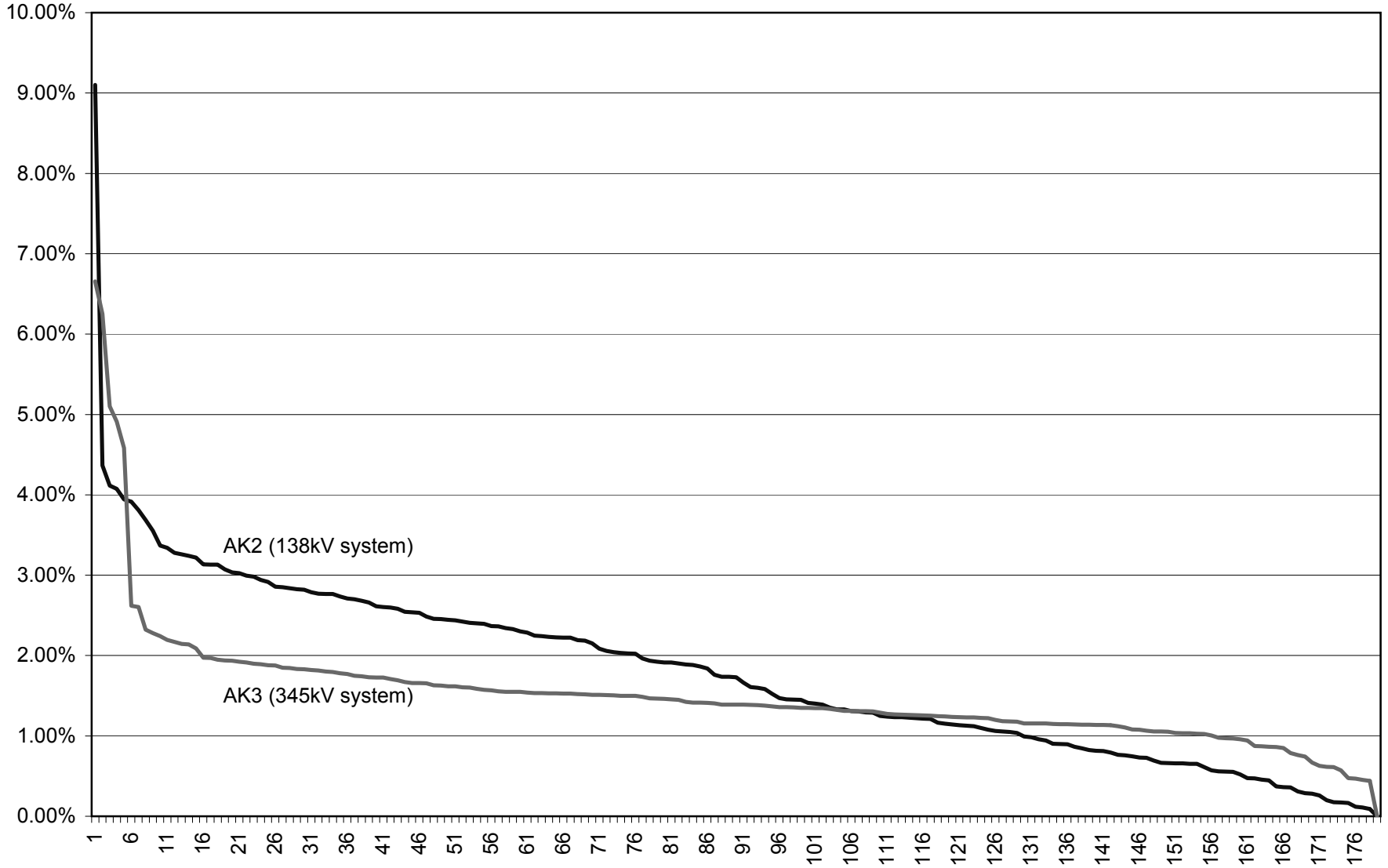
EXHIBIT 10

Losses from IP2 to Arthur Kill 3

	IP2 Bus	AK3 Mean		Number of Times AK3 Losses are >n% of IP2 Bus LBMP					Loss % Statistics	
Hour	Mean LBMP	Loss Diff	Loss %	>1%	>2%	>3%	>4%	>5%	StdDev	CV
0	28.74	0.39	1.36%	156	11	1	1	1	0.55%	40%
1	25.27	0.35	1.40%	161	11	1	1	1	0.52%	37%
2	23.38	0.32	1.37%	162	8	1	1	1	0.50%	36%
3	22.58	0.31	1.37%	161	9	1	0	0	0.40%	29%
4	22.80	0.32	1.38%	164	8	1	0	0	0.39%	28%
5	25.18	0.37	1.47%	167	13	1	0	0	0.42%	28%
6	29.00	0.42	1.45%	152	24	1	0	0	0.53%	36%
7	35.08	0.54	1.53%	149	40	5	1	0	0.63%	41%
8	39.73	0.57	1.45%	141	36	2	1	0	0.60%	41%
9	43.07	0.59	1.37%	145	29	2	1	0	0.58%	43%
10	46.17	0.61	1.31%	142	29	2	0	0	0.58%	44%
11	49.79	0.63	1.27%	145	26	2	0	0	0.57%	44%
12	51.21	0.65	1.26%	140	24	2	1	0	0.57%	45%
13	54.79	0.66	1.21%	139	24	1	0	0	0.55%	46%
14	57.92	0.71	1.22%	139	25	1	0	0	0.56%	46%
15	58.21	0.70	1.21%	138	24	1	0	0	0.57%	47%
16	59.71	0.70	1.16%	131	24	1	0	0	0.56%	48%
17	54.96	0.65	1.18%	126	22	1	0	0	0.57%	48%
18	50.61	0.59	1.17%	117	20	0	0	0	0.55%	47%
19	47.48	0.56	1.19%	116	23	0	0	0	0.56%	47%
20	45.32	0.56	1.23%	125	21	0	0	0	0.54%	44%
21	42.56	0.55	1.29%	129	25	0	0	0	0.53%	41%
22	36.57	0.54	1.49%	153	38	0	0	0	0.49%	33%
23	32.11	0.47	1.47%	153	32	0	0	0	0.50%	34%
Average	40.93	0.53	1.30%	144	23	1	0	0		
StdDev	12.50	0.13	0.11%							
CV	31%	25%	9%							

EXHIBIT 11

Losses from IP2 to Arthur Kill as a % of IP2 Pre-Mitigation LBMP
Hour Zero



Market Monitoring 11
3/4/2002

EXHIBIT 12

Losses from IP2 to Arthur Kill as a % of IP2 Pre-Mitigation LBMP
Hour 16