

SCHEDULE 1 ANALYSIS

Project Status

Prepared by
Andrew P. Hartshorn and Keith N. Collins

Prepared for
Billing and Accounting Working Group
Albany, NY
September 19, 2002

- Resolved Issues
 - DAM Contract Balancing
 - Long Island Reserve Revenue Modeling
 - DAM Reported BPCG
 - Daily Reconciliation File Format Adjustments
- Identified Issues
 - ConEd Mitigated Minimum Load Block Bids
 - Grandfathered Rights
 - DAM Incremental Energy Bid Curves
 - DAM GT Start-Up Costs

- Unresolved Issues
 - RT Gilboa Modeling
 - Virtual BPCG Charges
- Remaining Issues
 - Rerun the Verification Process
 - Analyze Historical Outlying Results

LECG has worked to streamline the schedule 1 verification process. Some of these issues are related to software modeling inaccuracies and others were caused by data format changes. Outlined below are the issues LECG has resolved in the schedule 1 verification process. These issues are:

- LECG Modeling
 - DAM Contract Balancing
 - Long Island Reserve Revenue
 - DAM Reported BPCG
- NYISO Formating
 - Daily Reconciliation Format

LECG was double counting the group GT units in the replication of DAM Contract Balancing charges. The GT data is presented on a unit by unit basis as well as a grouped GT basis. After reviewing the reported DAM Contract Balancing charges LECG determined that the NYISO was correctly excluding the grouped GTs in their calculations, while LECG was incorrectly modeling the grouped GT values. Thus, LECG was overstating the DAM Contract Balancing charges.

The double counting of grouped GTs has been corrected in the schedule 1 verification process. LECG has greatly improved the accuracy of the replication of these charges. Before the fix was implemented LECG calculated \$63,196.69 in charges for 9/9/02, while the NYISO reported \$58,750.94. After the fix was implemented, LECG calculated \$58,752.13 in charges, accurate to over 99.99%.

LECG was counting Long Island reserve revenue shortfalls in the replication of day-ahead BPCG calculations. LECG has adjusted its BPCG calculations to reflect this inconsistency. The fix has resulted in increased accuracy of day-ahead BPCG and unit set replication.

On 9/6/02, LECG calculated BPCG > \$0 on 8 Long Island GT units. All 8 units were scheduled for reserves only. After the fix was implemented, all calculated BPCG payments went to zero on these units. The 4 remaining uplift units were in both the NYISO reported and the LECG calculated uplift unit sets.

LECG was incorrectly reading in the set of NYISO reported DAM BPCG units. Start-up costs were not modeled by LECG in a manner consistent with the BAS. The inclusion of these costs has increased accuracy of the reported BPCG charges as well as the BPCG unit set on a daily and hour by hour basis.

On 9/9/02 LECG calculated \$1,882 in internal BPCG payments and calculated a reported NYISO internal BPCG payment of \$1,712. However, the NYISO schedule 1 charge for this category was reported as \$1,866. LECG determined that an internal modeling error left out units whose combined minimum generation credit and start-up costs resulted in BPCG payments. LECG can now replicate the \$1,866 in NYISO reported internal BPCG payments and further increase the accuracy of reported and calculated BPCG payments.

For the billing reports starting on 6/24/02, the NYISO adjusted the file format of the daily reconciliation reports. New categories were added and some were removed. LECG has adjusted the schedule 1 verification process to account for all daily reconciliation file format changes.

- New Schedule 1 Categories
 - Virtual BPCG (81501)
 - Energy Limited Resource Balancing per Local Reliability (81210)
 - Energy Limited Resource Balancing per ISO (81211, 81212)
 - DAM Price Responsive Load Program Uplift (81401)
 - Balancing NYISO Bid Production Cost Guarantee Expenditure due to Curtailed Imports (81205, 81213)

- Additional New Categories
 - Several DAM Virtual Load and Supply Categories on both the income and the expenditure sides.
 - Several DAM Price Responsive Load categories on the expenditure side.
- Removed Categories Related to Schedule 1 -- These categories are known as ‘plugs’ on the expenditure side.
 - DAM LRR BPCG Expenditure (302) -- Calculations are included in DAM NYISO BPCG Internal Expenditure (30201)
 - Balancing LRR BPCG Expenditure (305) -- Calculations are included in Balancing NYISO BPCG Internal Expenditure (30501)

LECG has identified issues for which the NYISO must provide additional information in order to accurately replicate NYISO reported schedule 1 charges. LECG will work with the NYISO to create solutions to these identified issues. These identified issues include:

- Consolidated Edison Mitigated Minimum Load Block Bids
- Grandfathered Rights
- DAM Incremental Energy Bid Curves
- DAM GT Start-Up Costs
- Other Issues Related to RT Residuals (as yet unknown).

LECG does not receive in-city mitigated minimum load block bids from the NYISO. LECG currently receives in-city mitigated start-up costs and energy costs, but not minimum load block costs. In order to accurately replicate DAM internal BPCG payments, LECG will need to receive this information to better account for BPCG payments on mitigated units. At present, LECG overstates BPCG payments when in-city mitigation occurs.

On 9/9/02 an in-city mitigated unit was added to meet LRR in 23 hours. The unit generated at its minimum load block for all committed hours. LECG calculated different and higher BPCG for the unit than the NYISO. LECG believes that the difference in the calculated and reported numbers is due to in-city mitigation of the minimum load block. With the appropriate mitigated minimum load block costs, LECG believes it will more accurately calculate BPCG payments for in-city mitigated units.

LECG does not know the set of scheduled transactions based on Grandfathered Rights. LECG would like to evaluate the complete set of day-ahead schedules associated with Grandfathered Rights. With this information, LECG hopes to replicate the day-ahead congestion residuals.

- For June 2002, the average difference in reported and calculated DAM congestion residuals was over \$59,000.
- For July 2002, the average difference in reported and calculated DAM congestion residuals was over \$204,000.

The incremental energy bid curves used by billing are not the same as those used by SCUC. The MIS transforms these market participant bid curves into blocked curves that can be evaluated by SCUC.

LECG receives the SCUC blocked bid curves and not the original market participant bid curves. Therefore, LECG cannot accurately replicate BPCG associated with incremental energy bid curves. This issue causes problems with the replication of day-ahead BPCG payments as the energy curves used by LECG and by NYISO billing are not the same.

On 9/2/02 LECG calculated \$2,565 in BPCG payments for a non in-city unit. The NYISO, however, reported the BPCG to be \$2,319. LECG was able to replicate the net revenue position for the unit in all hours but the hours the unit was generating incremental energy. Only the incremental energy costs remained as an issue.

LECG has identified instances where the reported DAM GT start-up costs are inconsistent with both the mitigated and bid in start-up costs. LECG believes this to be inappropriate modeling of start-up costs on group GT units. LECG has not found evidence that there is a problem with start-up costs on non-group GT units or on non-GT units. The inappropriate GT start-up costs affect the reported DAM internal BPCG numbers.

On 9/9/02 LECG received mitigated start-up costs on in-city mitigated GT units. The start-up cost was explicitly reported for an in-city unit. However, when LECG compared the BPCG payments for the unit in all hours, the only hour that did not match up was the hour in which the unit started. LECG compared the mitigated SCUC start-up cost and the NYISO reported start-up cost and was unable to match the costs.

The real-time residual calculations have been identified as a significant issue. However, due to the noise created by other issues (i.e. Gilboa Modeling), LECG has not been able to identify the precise causes of the differences in LECG calculated and NYISO reported real-time residuals.

LECG is reviewing the data and is in the process of identifying the source(s) of these differences.

LECG and the NYISO have worked together on issues that have been previously identified, but have yet to resolve these issues. LECG and NYISO staff will continue to work towards a resolution for these issues. These issues include:

- RT Gilboa Modeling
- Virtual BPCG Charges

LECG compared the hourly NYISO reported and LECG calculated real-time energy residuals for 8/7/02. After reviewing the hourly pattern of differences, the data displayed a pattern that was similar to the scheduling of Gilboa. LECG worked with the NYISO to determine that there is a modeling issue with the Gilboa units.

Currently, neither LECG nor the NYISO have been able to identify the precise source of the problem. However, both LECG and the NYISO believe that this modeling issue causes problems with the calculations of the real-time residuals. LECG and the NYISO will continue to work on this issue to determine the source of the modeling inaccuracy.

LECG and the NYISO have determined that there is a potential market design flaw in regards to the modeling of virtual BPCG charges. After reviewing the virtual BPCG charges for 4/8/02 and 5/5/02, LECG determined that when units are added for just one hour for forecast load (and no hours for local reliability), all BPCG payments for the unit are included in the virtual BPCG charge, including uplift in hours where the unit was added to meet bid load.

The first step is to review the NYISO Tariff to determine if the modeling is consistent with the language of the tariff. The second step is to determine if the tariff language needs to be adjusted. The final step is to modify the logic to charge virtual BPCG caused by the forecast load commitment.

Currently, both NYISO staff and LECG are working together to resolve these issue.

The same issue potentially applies to LRR BPCGs.

LECG has significantly modified its schedule 1 verification process and is now in a better position to analyze the schedule 1 data. The remaining steps that LECG needs to perform is to:

- Rerun the Verification Process
- Analyze Historical Outlying Results

LECG has made significant changes to the schedule 1 verification process throughout the summer. LECG is currently in the process of rerunning all cases with the new logic.

Rerunning the case introduces problems with the analysis. Most notably, price corrections and rebills have occurred since the creation of the schedule 1 data.

- To correct for the rebill problem, LECG has the ability to obtain the base daily reconciliation reports for historical data and will analyze this data and not the rebill information.
- To correct for the price correction problem, LECG will utilize original prices whenever feasible.

LECG has also begun and will continue the process of determining the causes of the outlying issues as well as create appropriate tracking thresholds to review further outlying results.

The following slides of this presentation show statistics of the historical data as well as the historical outlying data that LECG has identified for further review.

- The timeframe reviewed consists of all dates between 3/10/02 and 9/11/02.
- All data has been taken from the earliest available version of the new formatted version of the MIS daily reconciliation report.

LECG has tracked historical reported schedule 1 data. The statistics are for all dates between 3/10/02 and 9/11/02.

Period	Category	Charge Sign	Average	St. Dev.	Minimum	Maximum
DAM	Reported BPCG on Internal Units	Positive	64,065.67	77,265.55	-	418,454.12
DAM	Reported BPCG on External Units	Positive	691.42	2,324.20	-	18,994.65
DAM	Reported Virtual BPCG	Positive	3,052.96	9,655.35	-	94,576.71
DAM	Reported BPCG on Units Committed in the LRR	Positive	57,003.85	68,890.94	-	515,732.17
DAM	Reported DAM Energy Residual	Positive	28,542.42	56,459.15	(13,274.17)	615,774.66
DAM	Reported DAM Congestion Residual	Negative	(313,415.12)	541,240.31	(3,846,946.03)	1,124,917.53
DAM	Reported DAM Loss Residual	Positive	(620,390.49)	293,406.65	(1,667,021.94)	(130,242.14)
RT	Reported Total BPCG on Internal Units	Positive	245,646.55	206,366.43	3,602.05	1,354,866.10
RT	Reported Total BPCG on External Units	Positive	32,197.37	36,725.41	1.56	217,306.34
RT	Reported BPCG on Units Committed in the LRR	Positive	354,484.45	439,197.40	290.29	2,466,471.88
RT	Reported Total BPCG on Curtailed Imports	Positive	162.30	1,820.18	-	24,716.46
RT	Reported DAM Contract Balancing	Positive	77,206.62	149,389.11	2,547.06	1,707,559.61
RT	Reported RT Energy Residual	Positive	204,530.08	239,682.50	(1,206,032.75)	1,281,084.87
RT	Reported RT Congestion Residual	Positive	468,536.96	862,723.31	(144,829.78)	9,676,100.47
RT	Reported RT Loss Residual	Positive	7,698.94	41,404.10	(166,717.33)	292,831.30

OUTLYING RESULTS

RT Internal BPCG

Date	Reported Total Bid Production Guarantees on Internal Units	Comments
6/2/2002	1,354,866.10	
7/4/2002	1,126,081.29	
6/26/2002	1,034,718.98	
7/22/2002	976,621.61	
7/1/2002	862,699.29	
6/17/2002	816,940.65	
7/2/2002	783,822.79	
7/30/2002	672,944.19	
7/3/2002	630,541.20	
4/18/2002	594,897.58	
6/22/2002	567,466.23	
7/31/2002	554,702.97	
7/5/2002	542,346.92	
7/15/2002	537,078.06	
8/5/2002	526,009.48	
7/19/2002	516,738.68	

A positive number indicates an undercollection.

OUTLYING RESULTS

RT External BPCG

Date	Reported Total Bid Production Guarantees on External Units	Comments
7/5/2002	217,306.34	
5/7/2002	195,726.15	
3/24/2002	156,608.12	
5/17/2002	153,772.81	
8/26/2002	145,544.06	
3/16/2002	138,693.93	
5/4/2002	134,734.53	
5/16/2002	134,618.29	
5/8/2002	107,862.71	
8/14/2002	107,420.42	
6/26/2002	104,350.72	
5/15/2002	98,804.14	
8/13/2002	96,836.39	
5/6/2002	96,217.81	

A positive number indicates an undercollection.

OUTLYING RESULTS

RT LRR BPCG

Date	Reported Total LRR Bid Production Guarantees	Comments
4/17/2002	2,466,471.88	
7/3/2002	2,137,867.55	
5/31/2002	2,065,211.24	
6/1/2002	2,050,622.25	
4/19/2002	2,046,627.93	
4/15/2002	1,946,911.89	
4/16/2002	1,479,947.26	
5/25/2002	1,385,897.70	
5/26/2002	1,236,647.82	
4/13/2002	1,234,315.93	
7/30/2002	1,185,085.95	
7/2/2002	1,064,358.71	

A positive number indicates an undercollection.

OUTLYING RESULTS

RT BPCG on Curtailed Imports

Date	Reported Total Bid Production Guarantees on Curtailed Imports	Comments
7/5/2002	24,716.46	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM Contract Balancing

Date	Reported DAM Contract Balancing	Comments
7/29/2002	1,707,559.61	
7/30/2002	568,249.60	
7/2/2002	535,088.35	
7/31/2002	498,340.49	
4/18/2002	396,692.70	
7/23/2002	299,861.88	
7/3/2002	295,169.62	
8/1/2002	267,294.33	
9/4/2002	257,076.66	
6/12/2002	245,003.70	
8/2/2002	216,878.35	
6/24/2002	206,537.59	
8/16/2002	205,090.22	
8/15/2002	197,683.49	

A positive number indicates an undercollection.

OUTLYING RESULTS

RT Energy Residual

Date	Reported RT Energy Residual	Comments
7/29/2002	1,281,084.87	
9/4/2002	1,272,449.33	
9/3/2002	1,202,239.95	
7/30/2002	867,732.91	
8/13/2002	668,722.37	
8/15/2002	663,847.86	
7/21/2002	649,795.12	
8/26/2002	573,285.30	
7/31/2002	569,471.99	
8/1/2002	568,991.51	
8/4/2002	529,143.82	
8/16/2002	526,346.99	
7/1/2002	(105,102.77)	
9/10/2002	(112,210.83)	
7/9/2002	(113,630.50)	
7/5/2002	(153,682.32)	
7/4/2002	(252,122.45)	
7/2/2002	(762,771.48)	
7/3/2002	(1,206,032.75)	

A positive number indicates an undercollection.

OUTLYING RESULTS

RT Congestion Residual

Date	Reported RT Congestion Residual	Comments
4/17/2002	9,676,100.47	
4/18/2002	4,347,467.39	
7/30/2002	3,424,079.79	
6/27/2002	1,788,472.05	
7/5/2002	1,698,507.33	
8/12/2002	1,520,784.83	
3/16/2002	1,376,556.29	
8/10/2002	1,318,049.59	
8/2/2002	1,277,291.94	
7/19/2002	1,247,307.27	
8/5/2002	1,240,845.24	
3/17/2002	1,189,562.35	
7/15/2002	1,188,241.55	
7/23/2002	1,171,693.43	
3/21/2002	(40,133.57)	
4/29/2002	(46,230.89)	
5/24/2002	(52,674.41)	
3/26/2002	(60,340.86)	
5/23/2002	(78,390.94)	
4/24/2002	(87,310.24)	
4/23/2002	(139,588.13)	
4/16/2002	(144,829.78)	

A positive number indicates an undercollection.

LECG

OUTLYING RESULTS

RT Loss Residual

Date	Reported RT Loss Residual	Comments
9/3/2002	292,831.30	
8/13/2002	145,238.25	
7/21/2002	119,414.10	
4/15/2002	104,661.30	
8/2/2002	87,072.75	
8/12/2002	80,955.65	
8/22/2002	75,028.10	
6/27/2002	73,439.04	
8/16/2002	72,455.17	
8/23/2002	69,304.17	
7/26/2002	63,580.58	
4/17/2002	(50,523.85)	
7/4/2002	(56,240.28)	
9/10/2002	(72,423.01)	
7/29/2002	(80,158.28)	
8/17/2002	(88,987.45)	
7/2/2002	(96,624.34)	
6/24/2002	(99,938.37)	
7/3/2002	(166,717.33)	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM Internal BPCG

Date	Reported BPCG on Internal Units	Comments
5/12/2002	418,454.12	
5/11/2002	326,139.67	
6/24/2002	323,894.28	
3/30/2002	289,524.50	
6/26/2002	260,453.73	
3/10/2002	243,311.15	
4/7/2002	241,910.57	
5/13/2002	241,506.32	
4/4/2002	231,088.93	
4/28/2002	230,628.60	
3/31/2002	219,383.87	
6/15/2002	208,463.80	
5/19/2002	208,335.02	
3/29/2002	207,052.26	
5/26/2002	204,115.45	
5/5/2002	202,210.61	

A positive number indicates an undercollection.

Date	Reported BPCG on External Units	Comments
4/10/2002	18,994.65	
8/15/2002	14,065.00	
4/19/2002	12,523.97	
4/11/2002	11,019.25	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM Virtual BPCG

Date	Reported Virtual BPCG	Comments
4/8/2002	94,576.71	
3/17/2002	36,713.73	
4/10/2002	35,202.56	
6/4/2002	32,002.86	
4/2/2002	29,760.03	
4/1/2002	28,897.89	
3/28/2002	28,760.11	
5/27/2002	27,950.21	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM LRR BPCG

Date	Reported BPCG on units committed for LRR	Comments
7/30/2002	515,732.17	
4/18/2002	368,869.32	
6/15/2002	246,297.88	
4/10/2002	239,415.71	
8/1/2002	224,793.61	
4/9/2002	215,663.21	
4/11/2002	208,984.43	
4/12/2002	191,242.47	
4/13/2002	173,474.97	
5/9/2002	170,627.08	
4/26/2002	170,612.02	
4/1/2002	164,261.51	
3/16/2002	162,255.05	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM Energy Residual

Date	Reported DAM Energy Residual	Comments
4/17/2002	615,774.66	
4/3/2002	279,326.44	
4/10/2002	189,671.44	
4/8/2002	133,548.35	
4/2/2002	117,961.66	
4/9/2002	115,953.66	
3/21/2002	114,192.98	
3/28/2002	108,371.18	
9/10/2002	(11,084.03)	
8/15/2002	(12,357.51)	
7/31/2002	(13,274.17)	

A positive number indicates an undercollection.

OUTLYING RESULTS

DAM Congestion Residual

Date	Reported DAM Congestion Residual	Comments
8/9/2002	1,124,917.53	
6/12/2002	363,277.46	
7/29/2002	327,238.56	
7/12/2002	279,039.40	
7/8/2002	267,320.89	
6/18/2002	200,139.84	
6/19/2002	187,536.22	
6/7/2002	155,568.39	
7/14/2002	(1,271,689.01)	
5/5/2002	(1,303,986.18)	
6/1/2002	(1,331,666.44)	
6/2/2002	(1,384,086.44)	
5/6/2002	(1,396,223.30)	
8/24/2002	(1,511,282.82)	
5/7/2002	(1,534,298.00)	
5/24/2002	(1,561,659.98)	
5/22/2002	(1,574,217.00)	
5/3/2002	(1,622,886.92)	
4/29/2002	(1,681,749.61)	
8/17/2002	(1,805,380.94)	
4/30/2002	(1,865,416.65)	
5/23/2002	(1,916,816.33)	
4/17/2002	(3,846,946.03)	All Long Island load inappropriately dropped out of billing process. Bill to be rerun with correct Long Island load.

A negative number indicates an undercollection.

LECG

OUTLYING RESULTS

DAM Loss Residual

Date	Reported DAM Loss Residual	Comments
8/2/2002	(1,667,021.94)	
7/31/2002	(1,659,149.95)	
8/1/2002	(1,649,655.88)	
8/14/2002	(1,523,538.51)	
8/15/2002	(1,515,192.91)	
8/5/2002	(1,514,037.31)	
8/16/2002	(1,370,598.88)	
7/30/2002	(1,366,177.81)	
7/29/2002	(1,273,843.41)	
8/13/2002	(1,197,643.91)	
8/12/2002	(1,114,076.32)	
6/27/2002	(1,104,357.89)	
6/26/2002	(1,097,118.98)	
7/2/2002	(1,074,226.90)	
7/1/2002	(1,047,591.72)	
7/3/2002	(1,044,176.38)	
7/18/2002	(1,003,537.60)	

A positive number indicates an undercollection.