Station Power

Compliance with FERC Order

And

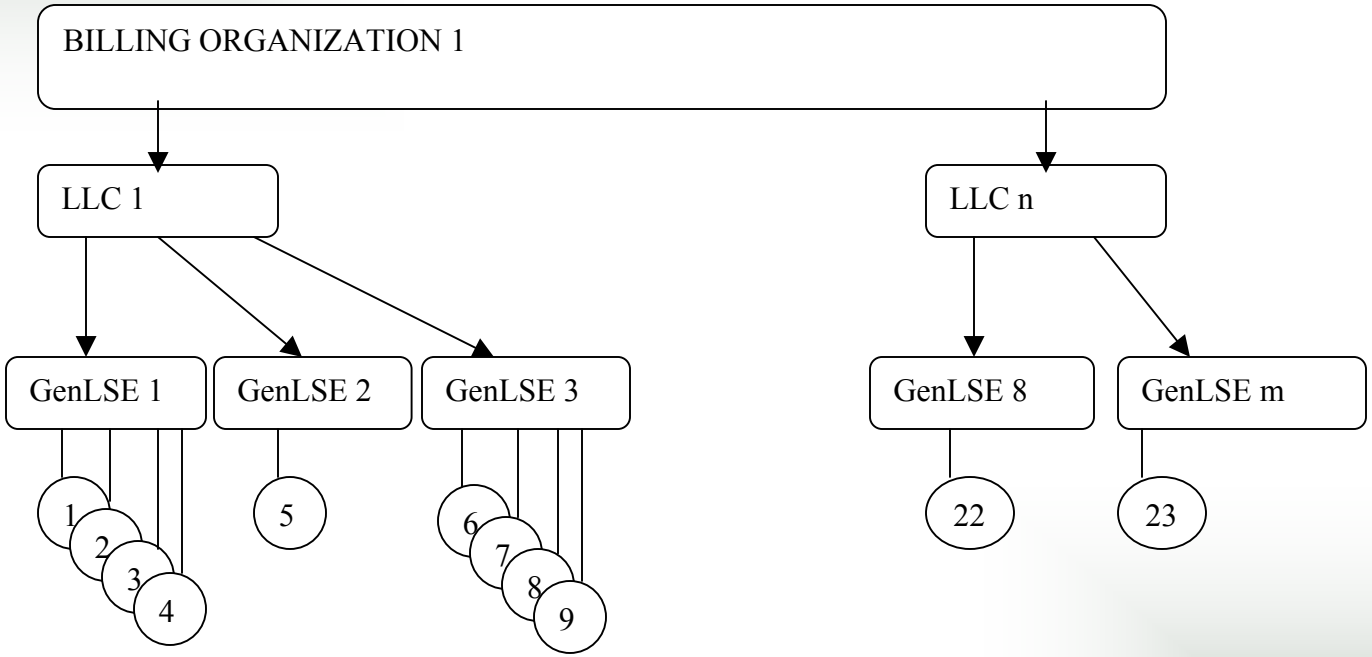
Proposed Method for NYISO Station Power Accounting

Draft –For Discussion Only

FERC Definition of Station Power

- **Electric energy used for:**
  - *The heating, lighting, air-conditioning and office equipment needs of the buildings on a generating facility's site*
  - *Operating the electric equipment that is on the generating facility's site*

Modeling Station Power - Diagram



Modeling Station Power - Explained

- *Each site or LLC will represent a site's generator portfolio.*
- *A cross-reference will map which LLCs belong to which Billing Organization.*
- *The Billing Org-to-LLC relationship is one to many.*
- *A cross-reference will map which generators belong to which LLC.*
- *The LLC to GenLSE relationship is one to one or one to many.*
- *The GenLSE to Generator relationship is one to one or one to many.*
- *A generator can be reassigned to a new LLC.*
- *All generators associated with a single LLC are considered affiliates and this relationship will be used to distinguish self-supply, remote self-supply and third-party supplied station power.*

Concept: GenLSE

- *GenLSE = Generator Load Serving Entity*
- *This new structure will be used to account for station power energy consumed at the generator load bus for each unit. (This is normally one GenLSE per generator, but clusters of GTs (Gas Turbines) may be represented as a single GenLSE)*
- *The load represented at each individual GenLSE is the station power consumed by the generator.*
- *The GenLSE will be billed and settled at generator bus LBMP, not ZONAL LBMP.*

Station Power Types

Self Supply

The netting of generation versus load over a monthly period for the same unit or complex of units affiliated with the same GenLSE.

Remote Self Supply

The netting of generation versus load over a monthly period for affiliate units owned by the the same corporate entity or LLC (and not a corporate affiliate – units associated with the same Billing Organization but different LLCs).

3rd Party Supply

The net of load over generation remaining after SS and RSS.

Self Supply Configuration

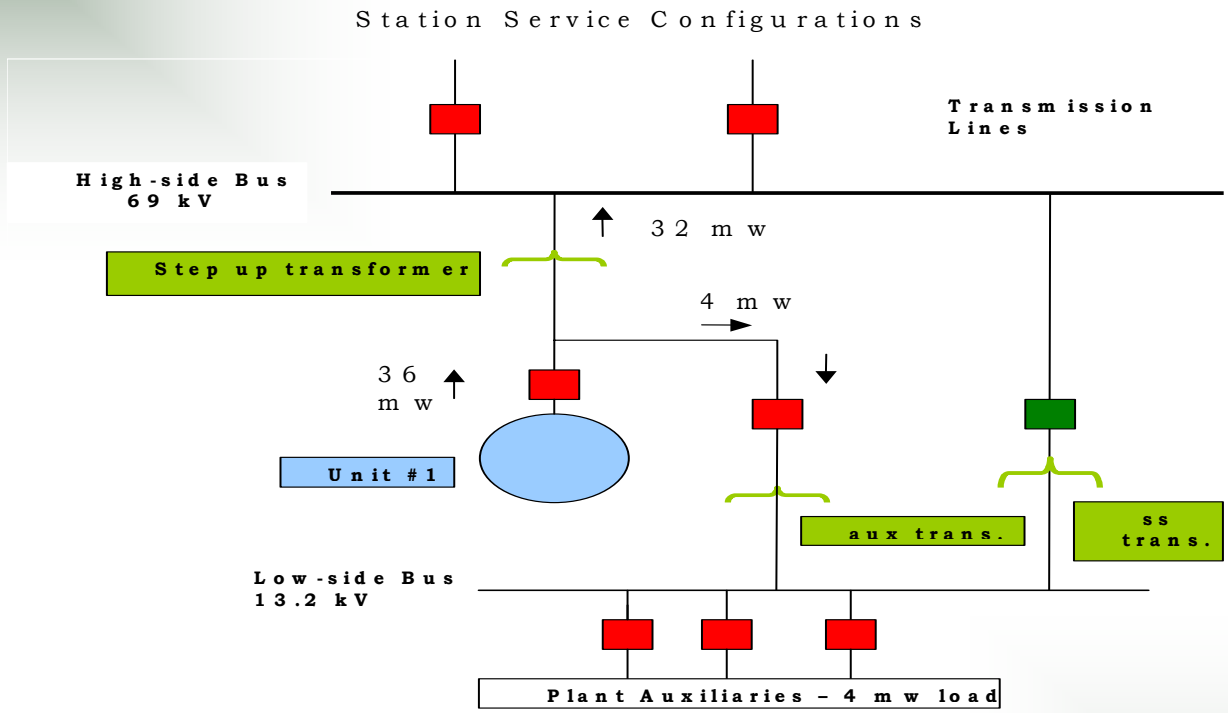


Figure 1 – Self Supply

When the generator is on line, it self supplies the plant auxiliaries off the low side, 13.2 kV bus, through the auxiliary transformer

Remote Self Supply Configuration

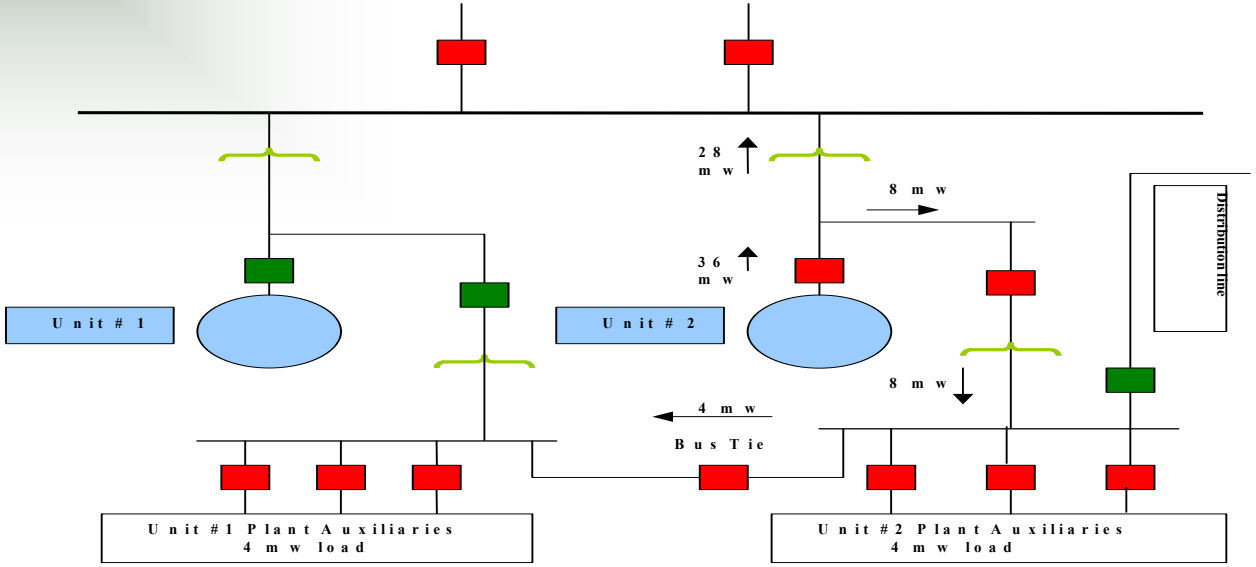


Figure 3 – Remote Self Supply

When unit #1 is off line, Unit 2 feeds both its own 4 mw plant load plus unit 1's 4 mw plant load. The feed in this example is through Unit #2's auxiliary transformer and across the bus tie.
Note that there is a distribution line backup feed in case both units are off line.

3rd Party Supply Configuration

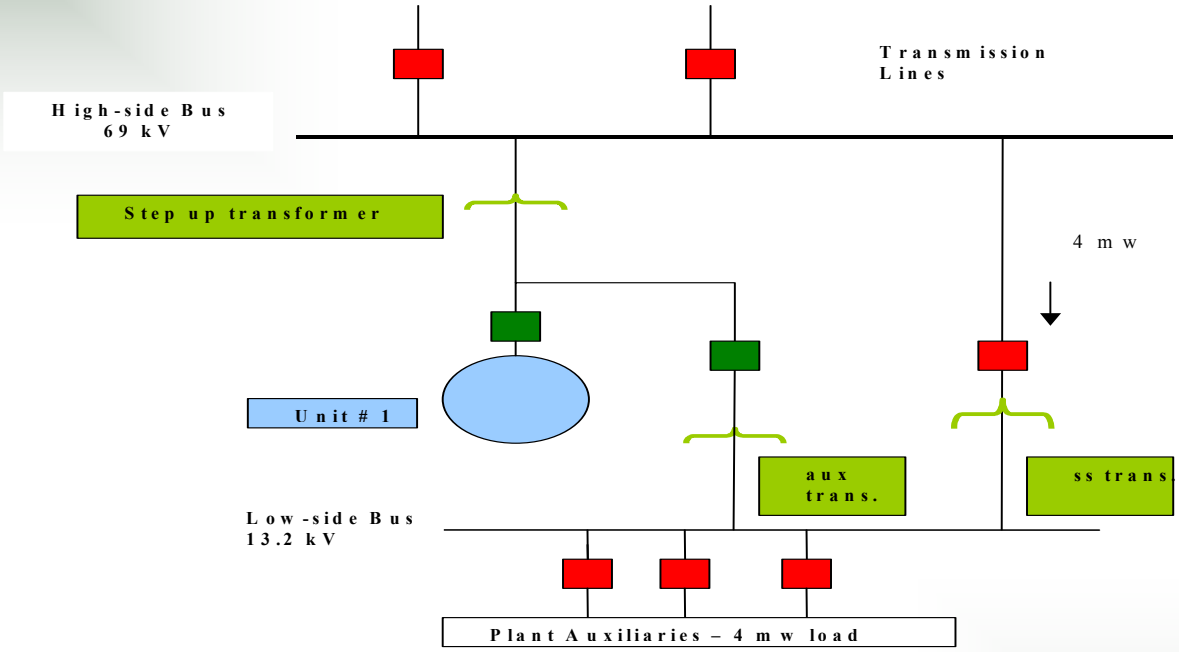


Figure 2 – off system

When the generator is off line, the plant auxiliaries are fed from the system through the station service transformer. In this example the feed is from the 69 kv bus. It could also come from a distribution line.

Charges for Generators

	TO Charges	NTAC	Ancillary Services
Self Supply	Wholesale	No	No
Remote Self Supply	Wholesale	Yes	No
3rd Party	Retail	Yes	Yes

Bidding Station Power

What Gets Bid for Load?

Page Ref: F-3

Load Bid

Load Name: None Selected	Date: 08/31/199 (mm/dd/yyyy)
	Interruptible Type: None Selected

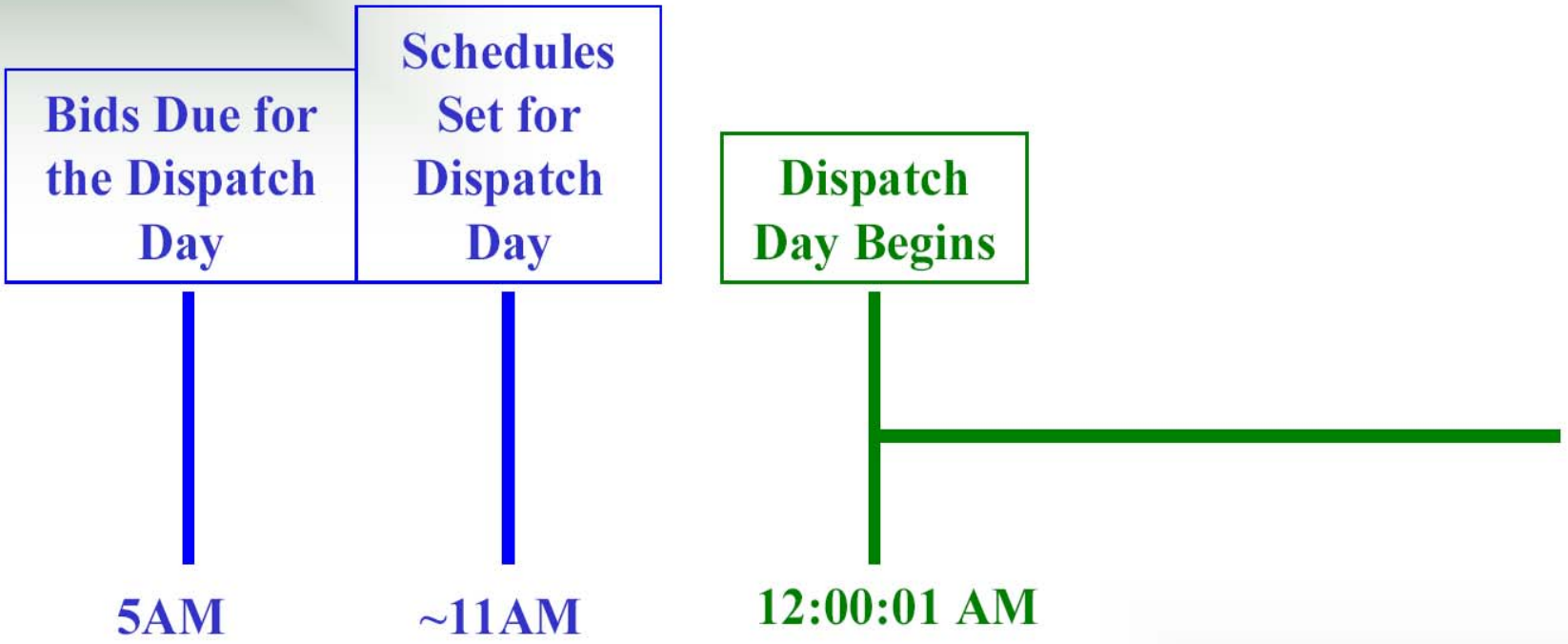
Time	Forecast MW	Fixed Bid MW	Price Cap #1 MW	Price Cap #1 $/MW	Price Cap #2 MW	Price Cap #2 $/MW	Price Cap #3 MW	Price Cap #3 $/MW	Interrupt Price Cap MW	Interrupt Price Cap $/MW	Interrupt Fixed MW	Interrupt Fixed $/MW	Bid Status	Schedule: Price Cap	Schedule: Inter Fixed MW	Schedule: Inter Price Cap MW
1999-N 00:00	1633	1200	88	38.01												
1999-N 01:00	1627	1194	88	36.01												
1999-N 02:00	1601	1167	88	34.01												
1999-N 03:00	1588	1154	88	32.01												

Subzone Load Calculation

Subzone Load = (∑ Subzone Ties + ∑ Subzone Generators) -

(∑ **Subzone Station Power (from actuals bid in Load Forecast unless TO supplies daily actuals**) + ∑ Subzone Losses)

Two Settlement Timeline



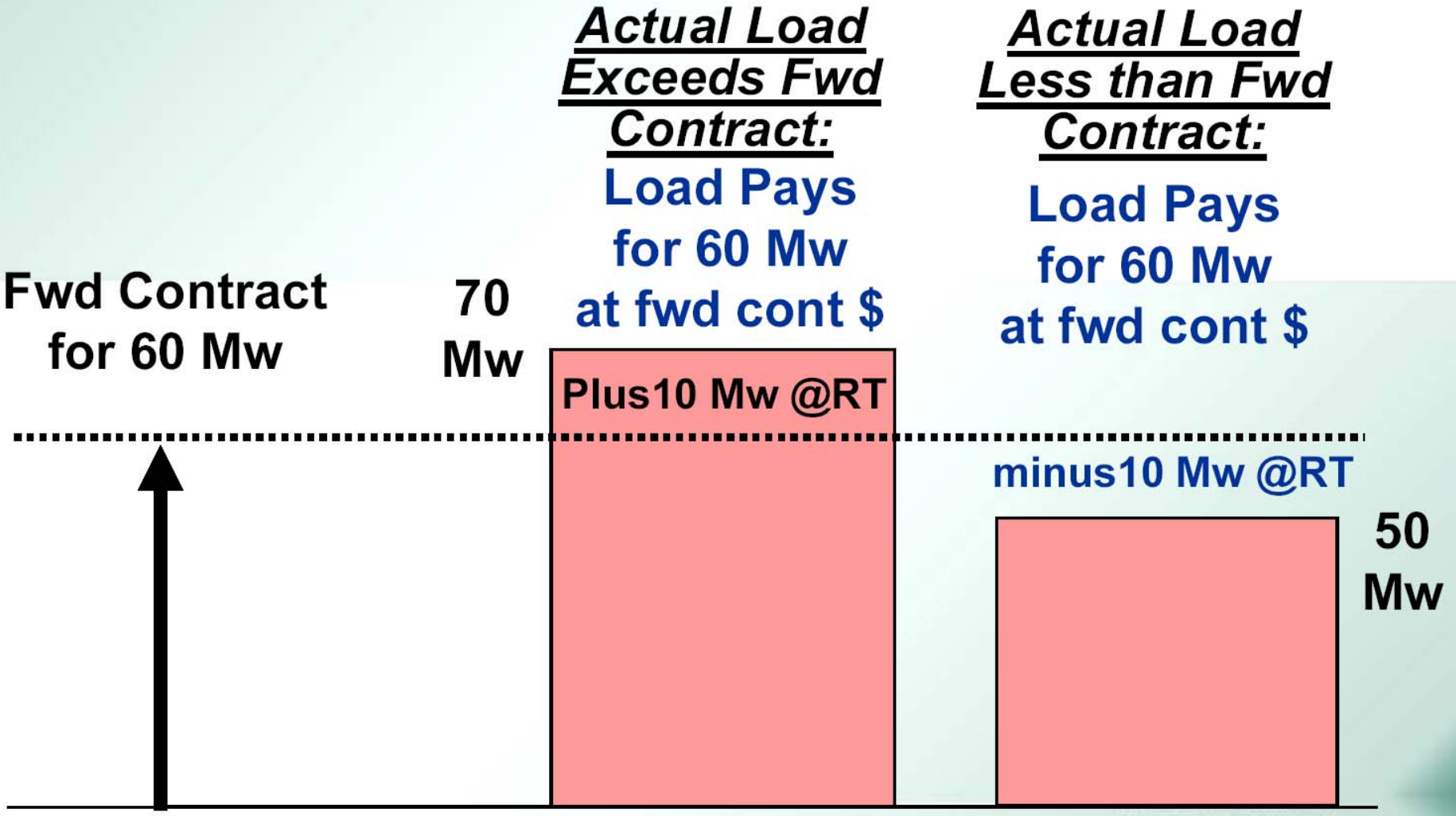
Day Ahead Market

Real Time Market

NEW YORK INDEPENDENT SYSTEM OPERATOR

"$"

Forward Contract for Covering Load vs. Real-Time Load



Accounting and Billing Calculations

Unit Net Gen

- Hourly Unit Net Gen Profile for all hours in the month will be calculated from Hourly Gen and Hourly Unit Station Power for each unit for each hour

Net Generation by Unit:															
HB	0	1	2	3	4	…	713	714	715	716	717	718	719	**Net**	**Neg Net**
Generator #															
1	10.00	8.00	-1.00	-2.00	0.00	…	0.00	-2.00	-2.00	-1.00	5.00	10.00	10.00	**35.00**	-8.00
2	4.00	2.00	-4.00	**-5.00**	0.00	…	0.00	-5.00	-4.00	-5.00	-4.00	-5.00	-4.00	**-30.00**	**-36.00**
3	-4.00	-4.00	-4.00	-4.00	0.00	…	0.00	-4.00	-4.00	-4.00	-4.00	2.00	4.00	**-26.00**	-32.00
4	-3.00	-3.00	-3.00	-3.00	0.00	…	0.00	-3.00	-3.00	-3.00	-3.00	4.00	8.00	**-12.00**	-24.00
											Owner Total:			**-33.00**	

Note: If this calculation results in a negative value, then the unit consumed more MWs in station power than it produced as energy MW in that hour. In the example above, units 2, 3, and 4 consumed more station power than the energy they generated according to the Net calculation shown in the "Net" column.

Retail Load to Net Negative Units

- For each LLC that has a negative Monthly Accumulated Unit Net Generation (MW), a calculation must be run to allocate Retail Load to Net Negative Units within that LLC. This allocation will be distributed only to the units with a Negative Monthly Accumulated Unit Net Gen, allocated first to the most negative unit and progressing until all MWs are distributed to the units that consumed more energy than they produced.

Generator	Unit Net Gen	Allocation	
1	35.000		
2	-30.000	30.000	
3	-26.000	3.000	
4	-12.000	-	
	-33.000	**33.000**	

For the above example, allocation of Retail Load to Net Negative Units results in only units 2 (30MW) and 3 (3MW) covering retail load

Retail Load Allocation

- Retail Load Allocation needs to be calculated to provide an index that will determine the hourly wholesale cost of allocated 3rd Party station power.
- **Allocation Formula:**
  (Unit Net Gen * Allocation of Retail Load to Net Negative Units) / ∑ (Hourly Unit Net Gen < 0)

Allocation of Retail Load to Units 2, 3 and 4 to Net Negative Hours During the Month:												
HB	0	1	2	3	...	714	715	716	717	718	719	Total
Generator#1												
2	-	-	3.333	**4.167**	#	4.167	3.333	4.167	3.333	4.167	3.333	**30.000**
3	0.375	0.375	0.375	0.375	#	0.375	0.375	0.375	0.375	-	-	**3.000**
4	-	-	-	-	#	-	-	-	-	-	-	**-**
												33.000

•For example, Unit 2 has a Net Gen of –5.00 for hour 3 and an allocation of retail load to net negative units of 30.000. Unit 2 has negative net generation totaling –36.00 MWHRs over the month.
•Hourly Allocation of Retail Load for Negative Net Gen for hour 3 for unit 2 is: ((-5.00*30.000)/36.00) = 4.167 MW.

Gen Bus LBMP

HB	0	1	2	3	…	714	715	716	717	718	719
Generator #											
1	$ 33.62	$ 28.46	$ 21.72	$ 22.54	…	$ 42.86	$ 42.58	$ 51.36	$ 45.63	$ 40.47	$ 30.12
2	$ 33.62	$ 28.46	$ 21.72	**$ 22.54**	…	$ 42.86	$ 42.58	$ 51.36	$ 45.63	$ 40.47	$ 30.12
3	$ 33.62	$ 28.46	$ 21.72	$ 22.54	…	$ 42.86	$ 42.58	$ 51.36	$ 45.63	$ 40.47	$ 30.12
4	$ 33.62	$ 28.46	$ 21.72	$ 22.54	…	$ 42.86	$ 42.58	$ 51.36	$ 45.63	$ 40.47	$ 30.12

Rebate Calculation

- Use Retail Load Allocation and Gen Bus LBMP to determine the Retail Load Adjustment:

Retail Load $ Adjustment:												
HB	0	1	2	3	…	714	715	716	717	718	719	Total
Generator#1												
2	$ -	$ -	$ 72.41	**$ 93.92**	…	$178.58	$141.93	$214.00	$ 152.10	$168.63	$100.40	**1,121.97**
3	$ 12.61	$ 10.67	$ 8.15	$ 8.45	…	$ 16.07	$ 15.97	$ 19.26	$ 17.11	$ -	$ -	**$ 108.29**
4	$ -	$ -	$ -	$ -	…	$ -	$ -	$ -	$ -	$ -	$ -	**$ -**
												1,230.25

Unit 2 has a Hourly Retail Load Allocation for hour 3 of 4.167 MW and a Gen Bus LBMP of $22.54. The Hourly Retail Load Adjustment $ is 4.167 * $22.54 = $93.92

The Aggregated Monthly Retail Load Adjustment $ = ∑ Hourly Retail Load Allocation. For the above example, the Aggregated Monthly Retail Load Adjustment $ for unit 2 is $1,121.97

Rebate/Charges – Breakdown

Generator	NYISO Rebate to GenCo	NYISO Charge to T.O.	Energy MW T.O. can charge to GenCo
2	$1,121.97	$1,121.97	30
3	$108.29	$108.29	3