

NYSEG and RG&E T&D Losses

7/17/2008

Case 08-E-0751



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Definition of “Losses”

- NYSEG and RG&E tariff definition:
 - “**Energy Losses**: The unusable energy that results from the generation, transformation, transmission, and distribution of Electric Power Supply to an Eligible Customer’s meter. Unaccounted for Energy (“UFE”) is also included. “



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Definition of “Losses”

- The NYISO definition is:
 - **“Real Power Losses:** The loss of Energy, resulting from transporting power over the NYS Transmission System, between the Point of Injection and Point of Withdrawal of that Energy.”



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Current Level of Losses

Level of loss (thousands of MWH lost)	NYSEG	RG&E
Bulk transmission (230kV and up)	496	37
Local transmission (115kV)	240	
Subtransmission (35kV through 69kV)	161	
Distribution (35kV and below)	540	401
Theft of service	10	
Other	41	
Total	1,488	438
Total Sendout	17,787	8,161
From 1998 Cost of Losses Reports Note – RG&E transmission includes all voltages		



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NYSEG Loss Factors

- NYSEG System 5.67%

Voltage Level	Service Classification	Energy/UFE Loss Factor
Transmission	7-4	1.0000
Sub-transmission	3S, 7-3	1.0150
Primary	3P, 7-2	1.0377
Secondary	1, 2, 6, 7-1, 8, 9, 12 Outdoor/Street Lighting	1.0728



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RG&E Loss Factors

- RG&E System
 - Primary load 4.68%
 - Secondary load 6.48%

Voltage Level	Service Classification	Energy Loss Factor
Primary	3, 8, 9	1.0491
Secondary	1, 2, 3, 4, 6, 7, 8, 9, SL	1.0693



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Loss Components

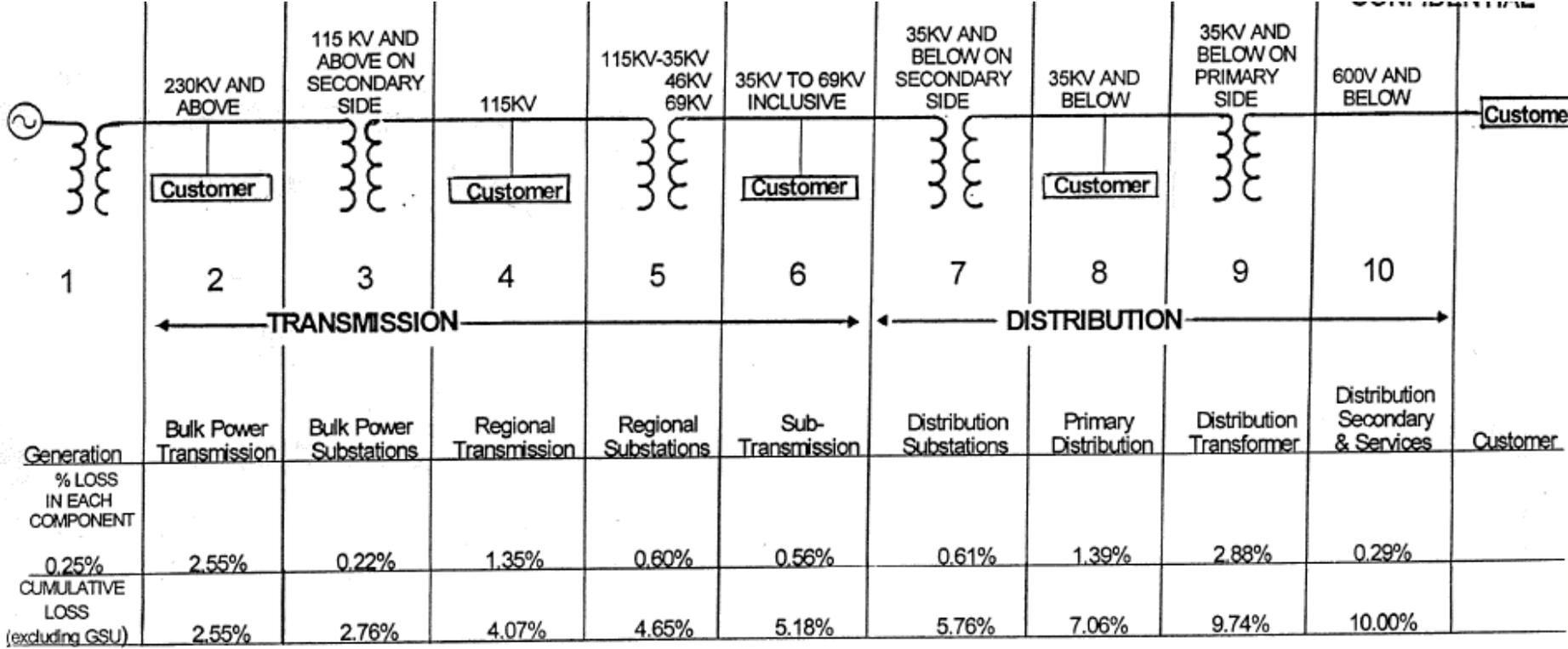
- All equipment contributes in some way to the total losses.



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Chart of components



Power Factor

- “Normal” conditions
 - Target 97% pf
 - Utilize fixed capacitors
 - Check light load conditions
- Peak conditions
 - Target 97% pf
 - Utilize switched capacitors



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Record of System Power Factor

The Energy Control System monitors real and reactive flows at the bulk-transmission interface and the transmission-subtransmission interfaces at least every 10 seconds

- Once a year, a system peak case is analyzed



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NYSEG-RGE REACTIVE RESOURCE ASSESSMENT

2008 SUMMER PEAK OPERATING BASE CASE						
	NYSEG MW	MVAR	PF	RGE MW	MVAR	PF
LOAD	2875	1330		1632	646	
LOSSES	145	1698		31	439	
CHARGING	0	-616		0	-155	
SHUNT DEVICES	0	-1536		0	-835	
TOTAL	3020	876	96.0%	1663	95	99.8%
DYNAMIC (Qgen)*		-493			-64	
TOTAL	3020	383	99.2%	1663	31	100.0%
DYNAMIC RESERVES (Qmax-Qgen)*		707			114	
SHUNT REACTORS NOT DISPATCHED		34			125	

* Located in NYSEG/RGE area

All information may not be exact as information depends on TO bus assignments.



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NYSEG Reactive Compensation

Transmission Substation Capacitor Banks	Number of Cap Banks	MVAR (nominal)
Existing	53	781
Additions	3	150
Total	56	931
Distribution Capacitor Banks		
Fixed	2,400	500
Switched	105	203
Total	2,505	703



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RG&E Reactive Compensation

Transmission Substation Capacitor Banks	Number of Cap Banks	MVAR (nominal)
Existing	22	505
Additions	7	432
Total	29	937
Distribution Capacitor Banks		
Fixed	529	254
Switched	180	685
Total	709	939



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Annual Costs for Reactive Compensation

- Ancillary costs paid to the generators through the ISO for reactive support
 - For 2007
 - NYSEG \$3.3 million
 - RG&E \$1.7 million
- Capital costs of upgrades to meet needs
- O&M costs to maintain compensation devices already deployed



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NYSEG Tariff Provisions

- Service Class No. 2, 3, and 7 provide for RKVAH metering and billing
 - Customer whose metered maximum demand is $\geq 200\text{kW}$ for 2 consecutive billing periods
 - RKVAH in excess of $1/3$ of metered kWhrs
- Current rate is \$0.00095/RKVAH



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RG&E Tariff Provisions

- RG&E does not meter reactive power and does not have rates for reactive power

SPECIAL PROVISIONS:

1. Power Factor Adjustment

Whenever the customer's equipment is so operated that the maximum kilovolt-amperes of **lagging reactive demand exceed forty-eight percent (48%) of the maximum kilowatt demand** during the billing month, the customer shall remedy that condition in a manner deemed adequate by Company, by either:

- a. Installing and maintaining at its own expense the power factor corrective equipment deemed necessary by Company to remedy the condition, or
- b. Making a cash contribution of the actual reasonable cost of any power factor corrective equipment installed by Company on its side of the point of delivery to effect such correction.



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Other Tariff Provisions

- Both NYSEG and RG&E have provisions in the Standardized Interconnection Requirements and Application Process that call for generators to maintain pf between 0.9 leading and 0.9 lagging



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Cost Recovery

- Current costs of losses are included in revenue requirement
- Revenue requirement is divided by billed (metered) kwhs to develop the rates



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General Planning and Operations Considerations

- Inspections and maintenance
- Tree trimming
- Proper system connections
- Equipment ratings
- IR scans
- Theft of Service vigilance
- Adherence to standards
- QC reporting for equipment problems



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Planning and Operations Considerations – cont.

- Losses are considered as part of the economic analysis portion of the transmission planning process.
- Distribution planning directs corrective action be taken as needed on the distribution facilities



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Budget Considerations

- System Planning drives system investment to make corrections to meet operating objectives
- Capital dollars are allocated for projects such as capacitor installation
- Equipment selection evaluations



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Customer Capacitors

- Customers have minimal incentive to add capacitors solely for power factor correction
- Other operational factors may have made project beneficial for a particular customer



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Summary

- Losses are considered as part of the planning process
- Losses are considered as part of project evaluation and equipment selection
- Opportunities exist to reduce losses but must be done economically and costs must be recoverable
- Loss improvement can be seen on individual projects but it takes time to change the whole system



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