P-886 ORIGINAL N-2(e)

Nova Scotia Utility and Review Board

IN THE MATTER OF *The Public Utilities Act,* R.S.N.S. 1989, c.380, as amended

- and -

IN THE MATTER OF an Application by Nova Scotia Power Incorporated for Approval of Certain Revisions to its Rates, Charges and Regulations

NSPI IR RESPONSES

HRM 1 – 7

Liberty 1 – 49

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NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF: The *Public Utilities Act,* R.S.N.S. 1989, c.380 as amended

IN THE MATTER OF: An Application by Nova Scotia Power Incorporated for Approval of Certain Revisions to its Rates, Charges and Regulations

RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-1: **Please file NSPI's updated cost of service analysis for street lighting, dated July 31, 2006 as a part of this proceeding.**

Response IR-1: Please refer to Stutz IR-18.

NOVA SCOTIA UTILITY AND REVIEW BOARD

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-2: **Please provide a breakdown detailing the cost by component of the $4.338M figure for street lighting distribution expenses shown on line (7), column (11) of Exhibit 6A in Appendix G.**

Response IR-2: See the following table:

Cost Component	Amount $K
Direct Expenses	$2,919
Allocation of COPS Admin. & Pension Cost	317
Allocation of Corporate Overhead	1,102
Total Street Light Maintenance Cost	$4,338

Direct Expenses include Customer Operations labour, materials, vehicles and miscellaneous costs associated with maintaining Company-owned streetlights.

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TO: NSPI

FROM: HRM

Question IR-3: **Please provide all calculations and workpapers in support of line (10), columns (4), (5) and (6) of Exhibit 9A in Appendix G.**

Response IR-3: Since this load is not metered, there is no actual hourly consumption data collected. As a result, a representative class curve, developed on engineering principles, is used.

The class comprises several types of electrical devices, each with differing power requirements. Many, such as streetlights and area lighting, have a seasonal pattern, affected by ambient outdoor light conditions, and generally operate from dusk to dawn. Others, such as traffic control lights and signage, operate continuously or with a fixed duty cycle. A portion of the unmetered load is essentially flat and a portion exhibits a daily, and seasonally-changing pattern. The connected demand of this class in 2007 will be approximately 27MW, with about 25MW of the total affected by the number of hours of darkness.

The system coincident factor of 62.3 percent (Exhibit 9A, Column 5) for the unmetered class, represents the relationship of the unmetered class's system coincident peak demand to the class non-coincident peak demand, or connected demand.

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-4: **Please provide a complete rate/revenue proof for the Unmetered class showing a breakdown of billing determinants, the applicable proposed rates and the computation of the figure of $24.158M shown on column (6), line (10) of Exhibit 10 in Appendix.**

Response IR-4: Please refer to Attachment 1.

TABLE HRM IR-4

PROOF OF REVENUE
2007 PROPOSED STREET / CROSSWALK LIGHTING RATES

Description	Rate Code	kW.h/Mo.	Units	2007 Proposed Rate Components ($/mo) Power & Energy	Maintenance	Capital	2007 Proposed Rates ($/mo)	Revenue by Rate Component ($/year) Power & Energy	Maintenance	Capital	2007 Proposed Revenue ($)
Incandescent < 300 Watts	001	97	31	$11.25	$2.76	$6.26	$20.27	$ 4,185	$ 1,027	$ 2,329	$7,541
Incandescent > 300 Watts	002	154	3	17.86	2.76	6.40	27.02	643	99	230	973
Incandescent < 300 Watt	003	97	7	11.25	0.00	0.00	11.25	945	0	0	945
			41								9,458
Mercury Vapour :											
Mercury Vapour 100 Watts	100	43	269	4.99	2.76	5.30	13.05	16,108	8,909	17,120	42,137
Mercury Vapour 125 Watts	101	52	11,962	6.03	3.68	4.97	14.68	865,570	528,242	712,736	2,106,548
Mercury Vapour 175 Watts	102	69	3,150	8.00	2.76	4.92	15.68	302,400	104,328	185,880	592,608
Mercury Vapour 250 Watts	103	97	1,149	11.25	2.76	6.26	20.27	155,115	38,055	86,323	279,492
Mercury Vapour 400 Watts	104	154	1,484	17.86	2.76	6.40	27.02	318,051	49,150	113,940	481,141
Mercury Vapour 700 Watts	105	260	12	30.15	2.76	8.42	41.33	4,342	397	1,213	5,952
Mercury Vapour 1000 Watts	106	363	76	42.09	2.76	10.12	54.97	38,386	2,517	9,230	50,134
Mercury Vapour 250 Watt Cont. Oper.	107	212	5	19.05	5.52	6.26	30.83	1,143	331	376	1,850
Mercury Vapour 125 Watts	201	52	9	6.03	3.68	0.00	9.71	651	397	0	1,049
Mercury Vapour 175 Watts	202	69	24	8.00	2.76	0.00	10.76	2,304	795	0	3,099
Mercury Vapour 250 Watts	203	97	34	11.25	2.76	0.00	14.01	4,590	1,126	0	5,716
Mercury Vapour 400 Watts	204	154	10	17.86	2.76	0.00	20.62	2,143	331	0	2,474
Mercury Vapour 700 Watts	205	260	0	30.15	2.76	0.00	32.91	0	0	0	0
Mercury Vapour 1000 Watts	206	363	17	42.09	2.76	0.00	44.85	8,586	563	0	9,149
Mercury Vapour 125 Watts	301	52	11	6.03	0.00	0.00	6.03	796	0	0	796
Mercury Vapour 175 Watts	302	69	153	8.00	0.00	0.00	8.00	14,688	0	0	14,688
Mercury Vapour 250 Watts	303	97	54	11.25	0.00	0.00	11.25	7,290	0	0	7,290
Mercury Vapour 400 Watts	304	154	16	17.86	0.00	0.00	17.86	3,429	0	0	3,429
Mercury Vapour 700 Watts	305	260	1	30.15	0.00	0.00	30.15	362	0	0	362
Mercury Vapour 1000 Watts	306	363	7	42.09	0.00	0.00	42.09	3,536	0	0	3,536
			18,443								3,611,451
Fluorescent :											
Fluorescent 2x24" 70 Watts	110	30	913	3.48	5.52	4.30	13.30	38,127	60,477	47,068	145,672
Fluorescent 2x48" 220 Watts	111	85	153	9.86	5.52	4.73	20.11	18,103	10,135	8,686	36,924
Fluorescent 2x72" 300 Watts	112	116	68	13.45	5.52	5.53	24.50	10,975	4,504	4,513	19,992
Fluorescent 4x72" 600 Watts	113	222	15	25.74	5.52	7.49	38.75	4,633	994	1,349	6,976
Fluorescent 1x96" 110 Watts	114	47	5	5.45	5.52	5.21	16.18	327	331	313	971
Fluorescent 1x72" 150 Watts	115	60	2	6.96	5.52	4.55	17.03	167	132	109	409
Fluorescent 4x48" 440 Watts	116	166	2	19.25	5.52	5.70	30.47	462	132	137	731
			1,158								211,674
Fluorescent 4x72" 600 Watts	213	222	0	25.74	5.52	0.00	31.26	0	0	0	0
Fluorescent 1x96" 110 Watts	214	47	26	5.45	5.52	0.00	10.97	1,700	1,722	0	3,423

TABLE HRM IR-4

PROOF OF REVENUE
2007 PROPOSED STREET / CROSSWALK LIGHTING RATES

Description	Rate Code	kW.h/Mo.	Units	2007 Proposed Rate Components ($/mo) Power & Energy	Maintenance	Capital	2007 Proposed Rates ($/mo)	Revenue by Rate Component ($/year) Power & Energy	Maintenance	Capital	2007 Proposed Revenue ($)
Fluorescent 1x72" 150 Watts	215	60	3	6.96	5.52	0.00	12.48	251	199	0	449
Fluorescent 4x48" 440 Watts	216	166	0	19.25	5.52	0.00	24.77	0	0	0	*0*
Fluorescent 1x48" 120 Watts	217	49	1	5.68	5.52	0.00	11.20	68	66	0	134
Fluorescent 2x48" 220 Watts	218	85	0	9.86	5.52	0.00	15.38	0	0	0	0
								0	0	0	
Fluorescent 4x35"	330	47	2	5.45	0.00	0.00	5.45	131	0	0	131
			32								4,137
Fluorescent Crosswalk - Continuous Burning - Customer Owned :											
Fluorescent 2x24" 70 Watts	118	66	17	5.93	0.00	0.00	5.93	1,210	0	0	1,210
Fluorescent 4x48" 440 Watts	119	364	21	32.70	0.00	0.00	32.70	8,241	0	0	8,241
Fluorescent 4x72" 600 Watts	117	486	2	43.67	0.00	0.00	43.67	1,048	0	0	1,048
Fluorescent 2x96"	120	254	29	22.82	0.00	0.00	22.82	7,942	0	0	7,942
Fluorescent 4x96"	150	613	23	55.08	0.00	0.00	55.08	15,201	0	0	15,201
			92								33,642
Fluorescent Crosswalk - Photocell Burning - Customer Owned :											
Fluorescent 2x24" 70 Watts	310	30	1	3.48	0.00	0.00	3.48	42	0	0	42
Fluorescent 4x48" 440 Watts	311	166	5	19.25	0.00	0.00	19.25	1,155	0	0	1,155
Fluorescent 4x72" 600 Watts	313	222	0	25.74	0.00	0.00	25.74	0	0	0	0
Fluorescent 2x72"	312	116	2	13.45	0.00	0.00	13.45	323	0	0	323
Fluorescent 1x96"	314	47	25	5.45	0.00	0.00	5.45	1,635	0	0	1,635
Fluorescent 1x72"	315	60	0	6.96	0.00	0.00	6.96	0	0	0	0
Fluorescent 4x96"	350	280	78	32.47	0.00	0.00	32.47	30,392	0	0	30,392
			111								33,546
Low Pressure Sodium :											
Low Pressure Sodium 90 Watts	132	45	2	5.22	8.28	10.34	23.84	125	199	248	572
Low Pressure Sodium 135 Watts	130	60	61	6.96	8.28	10.34	25.58	5,095	6,061	7,571	18,727
Low Pressure Sodium 180 Watts	131	80	870	9.28	8.28	11.84	29.40	96,883	86,443	123,593	306,920
Low Pressure Sodium 180 Watts E&M	231	80	43	9.28	8.28	0.00	17.56	4,788	4,272	0	9,061
Low Pressure Sodium 180 Watts E/O	331	80	37	9.28	0.00	0.00	9.28	4,120	0	0	4,120
			1,013								339,400
High Pressure Sodium :											
High Pressure Sodium 70 Watts	123	32	38,321	3.71	2.76	4.90	11.37	1,706,051	1,269,192	2,251,625	5,226,868
High Pressure Sodium 100 Watts	124	45	45,889	5.22	2.76	4.79	12.77	2,874,487	1,519,844	2,637,346	7,031,677
High Pressure Sodium 150 Watts	125	65	5,241	7.54	2.76	4.83	15.13	474,206	173,582	303,824	951,611

TABLE HRM IR-4

PROOF OF REVENUE
2007 PROPOSED STREET / CROSSWALK LIGHTING RATES

Description	Rate Code	kW.h/Mo.	Units	2007 Proposed Rate Components ($/mo) Power & Energy	Maintenance	Capital	2007 Proposed Rates ($/mo)	Revenue by Rate Component ($/year) Power & Energy	Maintenance	Capital	2007 Proposed Revenue ($)
High Pressure Sodium 250 Watts	121	100	5,256	11.60	2.76	5.53	19.89	731,635	174,079	348,494	1,254,208
High Pressure Sodium 400 Watts	122	150	3,667	17.39	2.76	5.73	25.88	765,230	121,451	252,195	1,138,875
HP Sodium 100 Watts - Cont. Oper.	126	99	0	8.89	5.52	4.79	19.20	0	0	0	0
High Pressure Sodium 70 Watts	222	32	224	3.71	2.76	0.00	6.47	9,972	7,419	0	17,391
High Pressure Sodium 100 Watts	223	45	110	5.22	2.76	0.00	7.98	6,890	3,643	0	10,534
High Pressure Sodium 150 Watts	224	65	232	7.54	2.76	0.00	10.30	20,991	7,684	0	28,675
High Pressure Sodium 250 Watts	221	100	160	11.60	2.76	0.00	14.36	22,272	5,299	0	27,571
High Pressure Sodium 70 Watts	323	32	6,299	3.71	0.00	0.00	3.71	280,431	0	0	280,431
High Pressure Sodium 100 Watts	324	45	2,508	5.22	0.00	0.00	5.22	157,101	0	0	157,101
High Pressure Sodium 150 Watts	325	65	1,299	7.54	0.00	0.00	7.54	117,534	0	0	117,534
High Pressure Sodium 250 Watts	321	100	1,677	11.60	0.00	0.00	11.60	233,438	0	0	233,438
High Pressure Sodium 400 Watts	322	150	86	17.39	0.00	0.00	17.39	17,946	0	0	17,946
High Pressure Sodium 500 Watts	327	183	3	21.22	0.00	0.00	21.22	764	0	0	764
			110,972								16,494,625
Metallic Additive :											
Metallic Arc 250 Watts	142	100	64	11.60	6.62	8.21	26.43	8,909	5,084	6,306	20,299
Metallic Arc 400 Watts	140	150	1,215	17.39	4.41	6.30	28.10	253,546	64,298	91,867	409,711
Metallic Arc 1000 Watts	141	360	833	41.75	6.62	9.68	58.05	417,333	66,174	96,784	580,290
Metallic Arc 150 Watts	143	67	1	7.77	6.62	8.21	22.60	93	79	99	271
Metallic Arc 250 Watts	343	100	66	11.60	0.00	0.00	11.60	9,187	0	0	9,187
Metallic Arc 400 Watts	342	150	153	17.39	0.00	0.00	17.39	31,928	0	0	31,928
Metallic Arc 1000 Watts	341	360	11	41.75	0.00	0.00	41.75	5,511	0	0	5,511
Metallic Arc 175 Watts	344	75	72	8.70	0.00	0.00	8.70	7,517	0	0	7,517
Metallic Arc 150 Watts	345	67	3	7.77	0.00	0.00	7.77	280	0	0	280
			2,418								1,064,994
TOTALS			**134,280**					**$10,161,661**	**$4,329,764**	**$7,311,503**	**$21,802,928**

TABLE HRM IR-4

PROOF OF REVENUE
2007 PROPOSED STREET / CROSSWALK LIGHTING RATES

DETERMINATION OF UNMETERED SERVICE LOAD GROWTH FOR 2007

		Sales based on Dec 2005 inventories (kWh)	2007 Unmetered Sales (kWh)	Sales Growth (kWh)	2006 Average Rate ($/kWh)	Proposed 2007 Average rate ($/kWh)	Dec 2005 Ratio of 70W to 100W HPS	Annual Sales Growth by Fixture Type (kWh)	Annual Energy Usage by Fixture (kWh)	Estimated # of Units Added	2007 HPS Pwr. & Eng. Rates	Forecast Rev. Inc. due to Sales Growth in 2007 ($)
Street & Crosswalk Lighting		87,708,312	89,014,842	1,306,530	$0.1077	$0.1158						
	70W HPS						45%	587,939	384	1,531	$3.71	
	100W HPS						55%	718,592	540	1,331	$5.22	
							100%	1,306,530		2,862		$151,534
Misc. Lighting		23,024,712	23,367,695	342,983	$0.0876	$0.0942						32,299
Total		**110,733,024**	**112,382,537**	**1,649,513**								**$183,833**

2007 Proposed Revenue (Using Est. 2007 Inv. Level)

	Power & Energy	Maintenance	Capital	Total
Proposed Streetlight Rate Revenue using Dec 2005 Inventory	**$10,161,661**	**$4,329,764**	**$7,311,503**	**$21,802,928**
Additional 2007 Streetlight Revenue	151,534	0	0	151,534
Proposed 2007 Streetlight Revenue	10,313,195	4,329,764	7,311,503	21,954,462
Proposed Misc. Lighting Revenue using Dec 2005 inventory	2,170,854			2,170,854
Additional 2007 Misc. Lighting Revenue	32,299			32,299
Total Proposed Unmetered Revenue	**$12,516,348**	**$4,329,764**	**$7,311,503**	**$24,157,615**

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-5: **Please provide the date and hour ended of NSPI's system peak in December 2005, January 2006 and February 2006.**

Response IR-5: See the following table:

Date	Hour
December 21, 2005	20:00
January 3, 2006	18:00
February 27, 2006	20:00

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-6: **With regard to NSPI's updated cost of service analysis for street lighting:**

a. The third column in Appendix A, Table 2, titled "Unmetered Accts with more than 10 lights & LED TCL Conversions" shows as assignment of 1.0 FTE for the Unmetered class.

i. Please provide support for the assignment of one full-time employee.

ii. Approximately what portion of the 1.0 FTE assignment is related to LED TCL conversions?

b. In Table 2, please confirm that:

i. An assignment of 15 full-time employees is used to allocate $2.6 million of Billing Services Operations, such that an assignment of 1.0 FTE carries a cost responsibility of $173,333.

ii. Residential cost responsibility per account for Billing is 6.52 FTE x $173,333/FTE / 415,831 accounts, or $2.75 per account.

iii. Unmetered cost responsibility per account for Billing is (0.12 FTE + 1.0 FTE) x $173,333/FTE / 7,491 accounts, or $25.92 per account.

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-6: (cont'd)

iv. Billing cost responsibility per account for Unmetered is approximately 9.4 times that for residential ($25.92/$2.75),

c. Please detail the activities involved in billing street lights and residential customers in support of NSPI's finding that it costs nearly 10 times as much to bill a street light account as a residential account.

d. Please detail all of the activities involved in billing a street lighting account with more than ten fixtures in any particular month. Also detail all of the activities involved in billing the same street lighting account in the subsequent month and discuss any differences. Provide the same information for residential customers, including new service requests.

e. How much direct labour is included in the $2.6 million figure in Table 2? What is the nature of the costs other than direct labour?

f. What is the nature of the difference in costs between the $2.6 million figure and the $3.272 million figure shown in Table 1 of Appendix A of the street lighting study?

Response IR-6: (a) (i) The following work routines are regularly performed by Billing Services personnel:

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Response IR-6: (cont'd)

1. Manual updating of billing dates for new services, or old services being removed.
2. Processing of unmetered billing exceptions such as invalid ending date and invalid fixed charge rate code.
3. Processing of daily customer inquiries, street light repairs, incorrect number of lights and incorrect rates (over/underbilling).
4. Setting up of new unmetered rates in the billing system.
5. Maintenance of existing 391 unmetered service rates in the billing system.
6. Coordinating conversion of incandescent traffic control lights to LED traffic control lights, in most municipalities. This involves creating service requests and billing adjustments on unmetered service accounts.
7. Billing Services reviews of five manual audit/exception reports identifying unmetered service accounts that could bill incorrectly such as:
   a) closing bills with unmetered services billing for less than 52 days;
   b) working new unmetered service requests that have not been assigned a rate code;
   c) inactive unmetered services with quantity greater than two;
   d) invalid street light reports.

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Response IR-6: (cont'd)

8. Performing testing and updates on unmetered services rate changes.
9. Setting up one-time and regular billing for municipal Christmas lighting.

(ii) 50 percent.

(b) (i) Confirmed. This includes costs other than labour. Please refer to (e) below.

(ii) This figure amounts to $2.72 per account.

(iii) Confirmed.

(iv) This figure amounts to 9.5 times ($25.92/$2.72).

(c) See response to (a), part (i). A residential account represents one connection to NSPI's system. One unmetered account often represents tens or hundreds of connections, requiring the types of activities described in response (a).

(d) See response to (a), part (i). The fact that there are multiple fixtures per account increases the activity for that account.

(e) Direct labour amounts to $0.6 million. The remaining costs of $2.0 million are associated with bill printing, preparation and postage.

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Response IR-6: (cont'd)

(f) The $3.272 million is associated with the 2006 Compliance Filing based on an estimate developed in 2005. The $2.6 million is the forecast estimate for 2006.

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-7: **With respect to NSPI's updated cost of service analysis for street lighting, pages 11 and 12 and Schedule 9:**

a. **Please provide all calculations and workpapers in support of the derivation of the "Misc. Small Loads Tariff Rate Components & 1kW lighting load", which, as indicated on the last page of Schedule 9, serves as the basis for the Power and Energy Rate component for street lighting.**

b. **In Schedule 9, and as NSPI discusses in lines 10-17 of its updated street lighting analysis, the new rates resulting from its analysis results in an increase of $0.276M over the current approved rates. Please quantify the portion of this increase that is related to the use of the Misc. Small Loads Tariff to price street lighting fixtures.**

c. **To what extent is the demand component of the Misc. Small Loads Tariff reflective of the magnitude of demand costs for the unmetered class in the cost of service study?**

d. **Please provide a breakdown and quantification of all functional components of the Misc. Small Loads Tariff, i.e., generation, transmission, distribution, customer and other, and indicate the portion of each functional component in the demand versus the energy charge of the rate.**

e. **If photocell actuated streetlight were to shift away from NSPI's system peak, to what extent can this be recognized in the Misc. Small Loads Tariff?**

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RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Question IR-7: (cont'd)

f. Provide the number of customers, kWh sales and metered kW for all customers directly served under the Misc. Small Loads Tariff.

g. On page 11, lines 14-17 it is indicated that the 2006 current approved rates for street and crosswalk lighting is $21.397M. Please reconcile this figure with the $23.796M figure shown in the compliance filing cost of service study, Exhibit 10, line (9), column (6).

Response IR-7:

(a) The table provided in Schedule 9 contains the calculations used to determine the Power & Energy cost component. Applying the cents per kWh rate for either the photocell control, or continuous operation, to the kWh usage for each type of light, results in the monthly Power & Energy charge. For photocell operation, NSPI used 4,000 dusk-to-dawn hours per year, or 333 hours per month. For continuous operation, NSPI used all 8,760 hours per year or 730 hours per month.

(b) The portion of this increase associated with the use of the Miscellaneous Small Loads Tariff amounts to a decrease of $2.669 million. Conversely, the maintenance cost component would increase by $3.358 million and the capital cost component would decrease by $0.413 million. The net effect would be an overall increase of $0.276 million.

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF: The *Public Utilities Act,* R.S.N.S. 1989, c.380 as amended

IN THE MATTER OF: An Application by Nova Scotia Power Incorporated for Approval of Certain Revisions to its Rates, Charges and Regulations

RESPONSE TO INFORMATION REQUEST

TO: NSPI

FROM: HRM

Response IR-7: (cont'd)

(c) Increases to rate components within each customer class are proposed to be applied uniformly in all classes.

(d) Generation, transmission, distribution, customer and other costs are allocated to customer classes and not to individual tariff components.

(e) The class load shape assumed for the unmetered class is based on the changing hours of dusk and dawn. If the system peak occurs during daylight hours when photocell-activated streetlights have shut down the streetlight, the loadshape used automatically reflects its lower contribution to system peak. The Misc. Small Loads Tariff is not affected by this.

(f) There are no customers specifically billed under the Misc. Small Loads tariff. The tariff's rate components are used to develop the power and energy costs for use with unmetered service rates.

(g) The $23.796 million figure includes miscellaneous lighting such as outdoor customer signs, telephone booths, cable power supply units and traffic control lights, whereas the $21.397 million figure is only street and crosswalk lighting.