

Appendix A

Educational and Professional Background

James J. Cunningham, Jr.

I am employed by the New Hampshire Public Utilities Commission (Commission) as a Utility Analyst. My business address is 21 S. Fruit Street, Suite 10, Concord New Hampshire, 03301.

I am a graduate of Bentley University, Waltham, Massachusetts, and I hold a Bachelor of Science-Accounting Degree. Prior to joining the Commission I was employed by the General Electric Company (GE). While at GE, I graduated from the Corporate Financial Management Training Program and held assignments in General Accounting, Government Accounting & Contracts and Financial Analysis.

In 1988, I joined the staff of the NHPUC. I have provided expert testimony pertaining to depreciation studies, actuarial studies for pension and retirement benefits, energy efficiency programs and other topics pertaining to NH electric, natural gas, water, and steam utilities. In 1995, I completed the NARUC Annual Regulatory Studies Program at Michigan State University, sponsored by the National Association of Regulatory Utility Commissioners. In 1998, I completed the Depreciation Studies Program, sponsored by the Society of Depreciation Professionals, Washington, D.C. I am a member of the Society of Depreciation Professionals (SDP). In 2008, I was promoted to my current position of Utility Analyst.

Appendix B

Discovery Materials

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 17-136

Date Request Received: 10/10/2018

Date of Response: 10/24/2018

Request No. STAFF 2-036

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Request from: New Hampshire Public Utilities Commission Staff

Witness:

Request:

Reference (Bates 230 and 259). Planned savings for Unitil-Gas (Northern) residential sector for 2019 are 123,275 therm savings (Bates 230) (i.e., $12,327.5 \times 10$). However, planned savings for purposes of calculating LBR are only 12,328 therms (Bates 259). Please reconcile.

Response:

The residential planned "therm" savings of 12,328 (Bates 259) were input incorrectly in the September 14, 2018 Core EE Filing. The values were input as MMBtu rather than therms and the resulting LBR was under-stated by a factor of ten.

Furthermore, in responding to this data request, the Company identified a formula error in the Commercial & Industrial (C&I) sector's savings (Bates 256). The C&I therm savings shown in line 13 should be 243,794 (i.e., $24,379.4 \text{ MMBtu} \times 10$). However, the sum of the annualized savings shown below in line 21 is 246,619 therms and this value was used throughout the Company's C&I LBR calculation.

Attachment Staff 2-036 provides a revised Lost Base Revenue (LBR) calculation for Northern Utilities incorporating the correct residential savings of 123,275 therms and the correct C&I savings of 243,794 therms.

(Unitil Response)

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 17-136

Date Request Received: 10/10/2018

Date of Response: 10/24/2018

Request No. STAFF 2-054

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Request from: New Hampshire Public Utilities Commission Staff

Witness: Miles Ingram, Marc E. Lemenager, Heather Tebbetts, Karen Asbury

Request:

Reference Bates 82. This page shows Eversource's overall C&I ratio of annual kW savings to annual kWh savings that is used in the calculation of LBR. Specifically, the ratio is 0.00013 (i.e., 8,734 / 67,184,440).

- a) Please provide a summary, by measure type (e.g., C&I Large Business Energy Solutions, Retrofit Track, Cooling, Heating, Process, etc.) that delineates the following components of the ratio including the following:
1. Maximum Demand Factor (MDF)
 2. % kW Reduction at Customer Peak
 3. % net to gross
 4. % In-Service Rate
 5. % Realization Rate
 6. Billing Adjustment for Ratchets
 7. Retirement Adjustment
 8. Percent of Savings Achieved in the First Year
 9. LBR ADR

Please refer to the LBR Working Group Report at page 6 for further information about this summary.

- b) Please provide similar summary for Liberty and Unitil.

Response:

- a) Please note that between the date that the LBR Working Group report was finalized and when the 2019 Update was filed, there was a reduction in the planned quantity of small business new lighting projects (from 69 to 43) and municipal parking lot lighting projects (from 29 to 28). Using the reduced quantity of projects results in a slightly reduced amount of planned 2019 C&I savings of 8,597 kW instead of the 8,734 kW reported in the LBR final working group report and included in Bates 82 of the 2019 plan. See attached for an updated Eversource LBR Template, and an updated Eversource Attachment E3, which includes LBR kW amounts to replace those on Bates 82.

For items 1 through 8, please refer to the attachments provided in response to STAFF 2-028. For item 9 (LBR ADR), please refer to Bates pages 85 and 87-89 in the 2019 Plan.

- b) Unitil: For items 1 through 8, please refer to Attachment Staff 2-54b-1, which provides the LBR Working Group's kW template incorporating Unitil's updated 2019 data from the 2019 Update filing. For item 9 (LBR ADR), please refer to Bates pages 169 and 174 in the 2019 Plan. While

responding to this data request, Unitil noticed that the C&I kW savings included in its Lost Base Revenue (LBR) calculation was incorrect. Attachment Staff 2-54b-2 provides a revised LBR calculation (i.e., Attachment H3 in the 2019 Update Plan).

Liberty: For items 1 through 9, please refer to Attachment Staff 2-54b-3 GSE LBR template, which provides the LBR Working Group's kW template incorporating Liberty's updated 2019 data from the 2019 Update filing. While responding to this data request, Liberty noticed that the C&I kW savings included in its Lost Base Revenue (LBR) calculation was incorrect. Attachment Staff 2-54b-4 GSE Revised Attachment F3 provides a revised LBR calculation (i.e., Attachment F3 in the 2019 Update Plan).

Public Service of New Hampshire d/b/a Eversource Energy
Docket No. DE 17-136

Date Request Received: 10/17/2018

Date of Response: 10/26/2018

Request No. STAFF 3-006

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Request from: New Hampshire Public Utilities Commission Staff

Witness: Miles Ingram, Heather Tebbetts, Christopher J. Goulding, Karen Asbury

Request:

Reference Filing at Bates 82, Bates 116 and Bates 170). The August 29, 2018 LBR Working Group Report (page 18) describes the components of the LBR calculation, broken down into (1) legacy kWh components in 2017 and 2018 and (2) a new kW component added in 2019.

- a. For 2019, please provide a schedule showing the individual components comprising the total 2019 LBR as follows: Eversource (Bates 82, line 21), \$4,741,259; Liberty (Bates 116, line 21), \$99,073 and Unitil (Bates 170, line 19), \$612,601.
- b. Please explain the variance between proposed LBR for Liberty and Unitil.

Response:

a)

For Eversource, please refer to Bates 82, Lines 8 (Residential kWh Savings), 11 (Legacy C&I Savings), 15 (2019 C&I kWh Savings) and 19 (2019 C&I kW Savings). The sum of these lines results in the total provided on Line 21. If necessary, please refer to the response provided to Staff 2-028 for a revised version of this attachment, including an updated kW Savings amount.

For Liberty, please refer to Bates 116, Lines 8 (Residential kWh Savings), 11 (Legacy C&I Savings), 15 (2019 C&I kWh Savings) and 19 (2019 C&I kW Savings). The sum of these lines results in the total provided on Line 21. If necessary, please refer to the response provided to Staff 2-054 for a revised version of this attachment, including an updated kW Savings amount.

For Unitil, please refer to Bates 170, Lines 7 (Residential kWh Savings), 10 (Legacy C&I Savings), 14 (2019 C&I kWh Savings) and 18 (2019 C&I kW Savings). The sum of these lines results in the total provided on Line 19. If necessary, please refer to the response provided to Staff 2-054 for a revised version of this attachment, including an updated kW Savings amount.

b)

Liberty has only included 2019 LBR because 2018 is a test year for the upcoming rate case to be filed in 2019 and savings and lost revenues are reset.

(Eversource, Liberty and Unitil Response)

Appendix C

Ratchet Analyses

Eversource New Hampshire
(Of 106 Rate LG customers, only 9 were billed under a ratchet demand for one month or more in the past 12 months.
Even if we assumed Customer 8 and 9 were due to energy efficiency, the overall annual impact is 0.002%.)

Difference in Billing Demand and Metered KVA Demand												
	Rate LG Billing Demand	Customer <u>1</u>	Customer <u>2</u>	Customer <u>3</u>	Customer <u>4</u>	Customer <u>5</u>	Customer <u>6</u>	Customer <u>7</u>	Customer <u>8</u>	Customer <u>9</u>	Total	Customer 8 & 9 Total
Feb-18	202,278	226	433	-	-	120	1,625	-	48	3	2,455	51
Jan-18	211,585	-	428	-	-	120	1,610	-	4	-	2,162	4
Dec-17	195,625	-	429	-	-	120	-	-	-	-	549	-
Nov-17	213,297	-	-	-	-	68	736	-	-	-	804	-
Oct-17	255,577	-	-	-	-	-	-	-	-	-	-	-
Sep-17	268,209	-	-	-	-	93	-	-	-	-	93	-
Aug-17	238,768	-	-	-	-	-	-	-	-	-	-	-
Jul-17	237,486	-	-	-	-	86	-	130	-	-	216	-
Jun-17	236,568	-	-	-	-	-	590	103	-	-	693	-
May-17	221,412	-	-	-	-	-	686	-	-	-	686	-
Apr-17	199,054	-	240	-	-	27	1,216	-	-	-	1,483	-
Mar-17	223,901	<u>277</u>	<u>239</u>	<u>671</u>	<u>134</u>	<u>-</u>	<u>894</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2,215</u>	<u>-</u>
	2,703,760	503	1,769	671	134	634	7,357	233	52	3	11,356	55
											0.4%	0.002%

Customer 1: Gravel / Paving Company

Customer 2: Gravel / Paving Company

Customer 3: Gravel / Paving Company

Customer 4: Gravel / Paving Company

Customer 5: Pipeline Company

Customer 6: Company with generation / supplemental service account - dependent on level of generation output

Customer 7: Company with hydro generation, higher water flow during June/July which offset plant load

Customer 8: Possible EE or other non-EE changes at facility or temperature sensitive load changes.

Customer 9: Possible EE or other non-EE changes at facility or temperature sensitive load changes.

*This analysis is for illustrative purposes only. This measures the impact of the ratched on sales, with no insight into EE measures undertaken.
 As there is a 0% impact of ratchets on billing in general, the impact of ratchets due to EE measures, if any, would necessarily be a subset of this 0%.

Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities
 LBR Working Group
 Rate Class G-1 2017 Ratchet Demand Minus Bill Demand
 June 7, 2018

<u>Customer #</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
1					96.4						71.2	31.6
2	25.6	21.6									19.1	77.7
3					112.0	92.0	142.0	62.0	62.0	62.0	62.0	2.0
4	55.4	49.4	53.4	49.4	35.4						20.4	42.8
5	74.4	86.4	70.4	36.4								98.4
6				46.9	48.5	33.3	42.9	40.5	40.5	26.1	11.7	0.5
7	25.3		8.1									
8			3.6									
9	44.8		36.8	56.8							7.2	28.8
10	143.7	228.9	79.2	139.7								68.2
11	366.7	368.7	358.7	352.7								
12			10.1									
13	4.6		14.5	5.9								10.8
14	2.0		2.0	6.0	10.0		6.0		5.2		11.6	15.2
15						21.7	21.7	23.8	15.4			
16	52.0	56.0	32.4	48.0								22.2
17	3.6	33.6	6.6	26.6	10.6	5.6		9.6				43.8
18	4.4	32.4	32.4	20.4	24.4	18.4						
19				9.6								
20	1332.2	643.2	1084.6		4.2						801.6	1511.4
21	85.6	121.6	121.6								10.4	86.4
22	78.4	86.4	78.4	62.4	22.4							49.6
23	28.8	64.8	40.8	49.0								18.0
24	92.4	134.4	92.4	50.4								
25	11.8	27.8										
26												258.6
27					13.0						46.4	
28					58.4	26.4	26.4	26.4	34.4	46.4	22.4	
29	38.3	40.3	18.7	34.3								10.1
30	49.3	22.1	12.5	30.1								8.8
31	57.3	63.3	61.9	15.1	4.8		0.8				9.7	22.7
32	30.8	34.8	40.8	40.8	46.8	4.8					14.8	36.8
33	116.0	120.0	124.0	76.0							98.4	114.4
34	272.9											

<u>Customer #</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
35		46.2	81.2	116.2							46.2	18.2
36	9.6				199.2	259.2	217.2	217.2	205.2	217.2	283.2	13.2
37						18.4	0.4	16.4			14.4	
38							13.9		61.1	13.9	60.5	
39					112.0	132.0	120.0	108.0	128.0	96.0	120.0	4.0
40	1140.5	1301.5	1295.1	1150.6								
41							112.3	115.5				
42								11.5				
43	122.0	132.0	152.0	152.0					48.0	78.0	58.0	178.0
44	22.9	55.9	58.3									31.3
45	57.6	141.6			15.6						24.5	120.5
46						35.2	47.2	31.2	31.2	27.2		
47	8.0	34.0	8.0	69.8		3.2	0.8			1.2	31.2	
48	96.4	135.9	181.4	201.4	211.4	211.4	221.4	213.2	182.0	146.0	81.0	
49					210.0	187.5	195.0	202.5	210.0	172.5	105.0	
50	783.6	706.4	753.2	895.2	361.6	75.6					116.8	432.4
51	132.8	132.8	64.8									
52											1.0	36.0
53	11.3											
54	356.1	360.1	358.1	358.1								
55	148.3	60.5	44.6	144.3	31.7							41.8
56												8.8
57					31.2			26.4			134.4	
58		33.6	33.6	45.6	93.6	79.2	91.2	88.8	91.2	69.6	72.0	31.2
59	56.7	18.7	40.7									
60								55.5				49.5
61									3.2			
62	101.9	99.9	84.9	108.9	40.7							105.4
63	7.9	15.9	17.5		7.9							14.1
64	91.7	87.7	103.7	295.7	223.7	231.7	227.7				82.8	95.6
65	60.8	60.8	56.8	52.8							5.6	17.6
66	6.0	2.2	2.8				0.8	2.8				2.2
67	259.7	259.7	259.7	253.7								
68		106.7	272.7	974.4	99.9		50.0					
69	17.3	2.9	14.9	22.1								
70			247.5	359.5								
71	106.4	108.0	110.4	41.6							14.9	92.5

Liberty Utilities (Granite State Electric) d/b/a Liberty Utilities
 LBR Working Group

Rate Class G-1 2017 Ratchet Demand Minus Bill Demand For Customers Who Received Energy Efficiency Measures in 2017
 June 7, 2018

Month	Customer #										
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>
January	9.28	22.5	22.5	90.9		31.2	241.2	880.8	2486.4	101.6	76.4
February	29.28	106.5				35.2		628.8	1706.4	105.6	64.9
March			7.5			19.2	133.2	832.8	1922.4	85.6	8.4
April		196.5								109.6	62.4
May				30.9		1.2		352.8	422.4		
June											
July											
August											
September											
October						20.4					
November						26.4		494.4	631.2		
December			104.4		19	66.4	180	458.4	1891.2	19.2	46.6

Month EE completed

Month EE would have taken effect (billing date is prior to completed project)

Customer EE Savings			
Customer	kW Savings	Minimum Demand Difference ¹	Savings > Demand Difference ¹
1	1.33	0.00	N/A
2	8.49	0.00	N/A
3	40.03	104.40	FALSE
4	25.35	0.00	N/A
5	38.55	19.00	TRUE
6	90.68	20.40	TRUE
7	0.13	180.00	FALSE
8	137.64	458.40	FALSE
9	232.48	1891.20	FALSE
10	29.83	19.20	TRUE
11	3.37	46.60	FALSE

¹ Billed Ratchet demand minus actual measured demand

Unitil Energy Systems, Inc.
Large General Service (G1) Customers Completing Energy Efficiency Projects During 2017

Ratchet Demand minus Metered Demand																	Participating
Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 EE Customers
Jan		133			58	249	76		59	18	151	152				185	1,081
Feb		152			63	5	77		60	11	150	157				168	844
Mar		93			26	37	67		59		138	115				135	670
Apr		58		51		164	34		34		97	159	6			65	668
May						87		11			84	41	36			61	321
Jun						164					44	50	56				315
Jul				60		168					12	22					263
Aug						187					28						215
Sep						218											218
Oct						229			19								248
Nov						197		12	55		99	30				127	45 565
Dec		62				171	88		56		146	101	1	64		186	13 888
Total Variance	-	498	-	111	147	1,877	343	23	343	29	948	828	99	64	-	928	57 6,295

(Ratchet - Metered Demand) / Metered Demand

5%

Data shows the effect of the ratchet on kVA billed to G1 customers who participated in energy efficiency in 2017. As shown, ratcheted kVa for these customers is 5% higher than the metered kVa. However, this does not necessarily mean that installed energy efficiency demand savings were 5% lower due to the ratchet.

For instance, a customer could be billed on a ratchet in the early part of the year and then complete an EE project in the middle of the year. The impact of the ratchet is still included in the (5%) percentage calculation although the ratchet and EE project have no relation to each other. In a second example, suppose a customer completes an EE project early in the year, but then later in the year, is billed on a ratchet due to a high summer peak caused by weather. The summer peak was still lower by the amount of the installed EE project thus the Company still lost revenue even though the ratchet was implicated. Even in instances where a ratchet may be billed for an entire year, an energy efficiency project would have had an impact on what that ratcheted demand was -- if not during the current year, then in the following year, since the ratchet only looks back 11 months.

As previously agreed, it is not feasible to identify the impacts with precision and not feasible to track demand charge impacts on a customer by customer basis. Overall, the ratchet only comes into play for 4 months on average, and is very small in percentage terms.

Notes:

All Data: Large General Service (G1) customer billing data from 2017

Number of G1 customers as of Dec. 2017 = 161

G1 customers completing energy efficiency projects during 2017 = 17

G1 "EE" customers' average months on ratchet = 4 Months in 2017

Schedule 1
C&I kW Savings and LBR
Calculation

DE 17-136

Schedule JJC-1

C&I kW Savings and LBR Calculation

Recommended Template to be Incorporated in Future Filings

Illustration Based on Eversource Data

Line No.	Description	Eversource	footnote
1	Annualized kWh Savings	67,184,440	1
2	Maximum Demand Factor (MDF)	0.000205	2
3	Extended Max. Load Reduction kW	13,793.0	
4	% kW Demand Reduction at Customer Peak	63.32%	2
5	Sub-Total Customer Peak kW Reduction	8,734.0	1
6	% Net to Gross	100.00%	2
7	Sub-Total Customer Peak kW Reduction	8,734.0	
8	% In-Service Rate	100.00%	2
9	Sub-Total Customer Peak kW Reduction	8,734.0	
10	% kW Realization Rate	99.80%	2
11	Sub-Total Customer Peak kW Reduction	8,716.5	
12	% Billing Adjustment to Reflect Ratchets (1)	100.00%	3
13	Sub-Total Customer Peak kW Reduction	8,716.5	
14	% Retirement Adjustment	100.00%	4
15	Total Customer Peak kW Reduction, Full Year	8,716.5	
16	% Annual Savings Achieved in First Year	50.00%	5
17	Total Customer Peak Red. in First Year	4,358.3	
18	Annualized (x12)	52,299.2	
19	Average Distribution Rate (ADR)	\$ 6.42	6
20	LBR	\$ 335,760.81	

footnotes:

1. Source: 2019 Update Filing (Bates 82)
2. Utilities provide Staff 2-28 going forward, "Tab ES 2019-2020 LBR Savings, kW" as part of filing, not as part of discovery.
3. Utilities provide ratchet analysis, similar to one provided in LBRWG Report at the time final LBR report is filed for 2019 (i.e., June 2020)
4. Not applicable at this time since no retirements are projected in 2019.
5. Based on half-year convention - i.e., 50 percent of 2019 installations are achieved in 2019 and 100 percent are achieved in 2020.
6. Based on 2019 Update Filing (Bates 86)