

STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

DOCKET DE 16-383

IN THE MATTER OF: LIBERTY UTILITIES (GRANITE STATE ELECTRIC)
CORP. d/b/a LIBERTY UTILITIES

REQUEST FOR CHANGE IN RATES

DIRECT TESTIMONY

OF

LESZEK STACHOW
Assistant Director,
NHPUC Electric Division

DECEMBER 16, 2016

1 **Introduction**

2 **Q. Please state your full name, current position and business address.**

3 A. My name is Leszek Stachow, and I am employed by the New Hampshire Public Utilities
4 Commission (Commission) as Assistant Director of the Electric Division. My business
5 address is 21 South Fruit Street, Suite 10, Concord, New Hampshire
6

7 **Q. Please summarize your education and professional work experience.**

8 A. My educational and professional background is summarized in Exhibit 1.
9

10 **Q. What is the purpose of your testimony in this proceeding?**

11 A. The purpose of my testimony is to question full acceptance of the Liberty Utilities
12 (Granite State Electric) Corp. (“Granite State “ or the “Company”) proposed marginal
13 cost study and comment upon elements of the rate design.
14

15 **Q. How is your testimony organized?**

16 A. My testimony will be confined to two major issues, the Company’s proposed marginal
17 cost study and select components of the rate design.
18

19 **Company Marginal Cost Study**

20 **Q. Please describe the proposed Company marginal cost study.**

21 A. Company witness James Simpson¹, indicated that he used approaches and
22 methodologies that were generally consistent with the marginal cost study that the

¹ James Simpson, Direct Testimony, Bates page 535, lines 18-20

1 Company filed in its most recent distribution rate case, Docket No. DE 13-063. Mr.
2 Simpson further made clear that he made revisions and modifications to the approach
3 that was used in Docket No. DE 13-063 that were appropriate to enhance the estimated
4 marginal cost components, or with the intent of being consistent with principles of
5 economic theory and marginal costs. However, in response to Staff data request 5-15,
6 Mr. Simpson confirmed that he understood that the Settlement reached in DE 13-063 did
7 not address the Company's MCS.

8
9 **Q. Did Mr. Simpson draw upon any Commission precedent in support of the Marginal**
10 **Cost Study.**

11 A. Yes, the witness made clear that since the mid-1980s, the Commission's rate design
12 policy and precedent has been to apply the concepts of marginal cost pricing in a rate
13 case² (a) to determine the share of total rate case revenue requirement for which each rate
14 class is responsible; and (b) to set base distribution rates accordingly, to promote proper
15 energy consumption decisions.

16
17 **Q. Please describe the components of the Company's marginal cost study as indicated**
18 **by the witness?**

19 A. According to Mr. Simpson, the marginal cost study comprises the following:³
20 First, calculations and analyses were prepared to estimate the marginal distribution
21 function related costs that the Company would incur to serve additional demand when the
22 Company is experiencing peak conditions and to serve additional customers.

² James Simpson, Direct Testimony, Bates page 537, lines 3-7

³ James Simpson, Direct Testimony, Bates page 537, lines 15-21

1 For additional peak demand costs, the witness calculated:

2 (1) the additional capacity-related distribution plant costs,

3 (2) the additional Operations and Maintenance (“O&M”) costs that would be caused by
4 an increment to peak demand.

5 (3) the additional general plant-related costs associated with the additions to capacity-
6 related distribution plant,

7 (4) the additional Administrative and General (“A&G”) expenses associated with the
8 additional O&M expenses.

9 (5) Finally, the witness calculated additional elements to account for the effects of bad
10 debt and working capital on the marginal costs previously determined.

11
12 **Q. What was the source of the data that the Company witness relied upon?**

13 A. According to Mr. Simpson, part of the data was furnished by the Company, i.e. (a)
14 distribution plant and general plant balances by account from 1997 to the present, and (b)
15 distribution, customer, customer accounting; A&G; and Materials and Supplies and
16 Prepayments Expenses, also for the period 1997 to the present.

17 The witness further used the Company data to create new data series as follows:

18 (1) Company data was adjusted using a Handy-Whitman index to restate plant additions
19 in 2015 constant dollars; expenses were restated in constant 2015 dollars using an
20 Implicit Price Deflator for Gross Domestic Product, published by Bureau of Economic
21 Analysis.

22 (2) Two separate analyses were used to (1) identify the amount of the capacity-related
23 distribution plant additions related to growth for the years 1997-2015, and (2) classify the

1 growth-related plant additions as being related to either the primary distribution system,
2 secondary distribution system, or line transformers.

3 (3) An analysis of expense accounts was used to functionalize distribution Operations
4 expenses and Maintenance expenses for the years 1997 to 2015 as either capacity-related
5 or customer-related, and also to classify the capacity-related expenses as related to either
6 the primary distribution system, the secondary distribution system, or line transformers.
7

8 **Q. What were the primary types of analysis that the Company witness used to calculate**
9 **the components of marginal costs as outlined earlier?**

10 A. Mr. Simpson made use of two primary approaches. For many of the marginal cost
11 components and making use of all years' data as provided by the Company, he used (a)
12 regression analysis to estimate the relationship between a specific measure of costs and a
13 specific "Cost Driver" variable that he selected. Where he could not find a reliable
14 statistical relationship between a Cost Variable and a Cost Driver variable, he determined
15 (b) the average unit costs.
16

17 **Q. What criteria did the witness use to accept or reject a regression equation?**

18 A. According to Mr. Simpson, he reviewed the following:⁴
19 (a) The reasonableness of the regression equation results. An equation was considered
20 reasonable if the slope coefficient had the "right sign" and was the "right size."
21 (b) The explanatory power of the regression equation as a whole, as measured by the R-
22 squared statistic.

⁴ James Simpson, Direct Testimony, Bates page 543, lines 1-5

1 (c) The explanatory power of the slope coefficient, as measured by the t statistic.

2 When the witness was unable to find a reliable statistical relationship, he made use of

3 average unit costs as a proxy for marginal costs.⁵

4 The witness qualified his approach⁶ by stating that although average unit costs are

5 generally not direct estimates of marginal costs in the same way that regression

6 coefficients can be, average costs are used in marginal cost studies; average unit costs are

7 also appropriate, if carefully prepared.

8

⁵According to the witness, he prepared the alternative average unit cost analyses since he had observed that there was a general overall pattern to the Company's historical plant additions and expenses that affected the estimates of marginal costs produced by the regression analyses.

⁶James Simpson, Direct Testimony, Bates page 540, lines 8-10

Q. Did Staff examine the proportion of the marginal cost study for which a reliable statistical relationship between cost variable and cost drivers had not been found?

A. Yes. In response to Staff data request 5-35, the Company witness indicated that the marginal cost components that were estimated using 2013 – 2015 average unit costs rather than by regression coefficients include the following eleven components:

1.	Marginal Distribution Plant-Related Costs: Primary System
2.	Marginal Distribution Plant-Related Costs: Secondary System
3.	Marginal Distribution Plant-Related Costs: Line Transformers
4.	Marginal Distribution Operations Expense: Primary System
5.	Marginal Distribution Operations Expense: Secondary System
6.	Marginal Distribution Operations Expense: Line Transformers
7.	Marginal Distribution Maintenance Expense: Primary System
8.	Marginal Distribution Maintenance Expense: Secondary System
9.	Marginal Distribution Maintenance Expense: Line Transformers
10.	Marginal Distribution Operations and Maintenance Expense: Customer Related
11.	Marginal Customer Accounts

Q. What proportion of the total marginal cost revenue requirement do the eleven components listed above represent?

A. In response to Staff data request 12-18, the Company witness made clear that the eleven components of the study represented 73.2% of the total marginal cost revenue requirement. (See Table No 1 in Attachment B) This suggests that a large part of the analysis may be based on costs that are more historic than marginal in nature.

1 **Q. How did the Company justify the use of the average unit marginal costs and**
2 **rejected the use of regression analysis?**

3 A. In response to a Staff request for an explanation for the predominant use of average unit
4 marginal costs by the Company, Staff was advised that “Marginal costs that were
5 estimated by regression analyses were unusually large and not in line with the
6 Company’s total embedded cost to serve or with estimates of marginal costs for other
7 similarly situated electric distribution companies.”⁷ As the Company witness asserted,
8 “Because of the significant difference between (a) the Company’s requested rate base
9 revenue requirement in this proceeding, and (b) the regression coefficient version of the
10 total marginal cost revenue requirement, I determined that it was more appropriate to use
11 the 3 year unit average cost version of the total marginal cost revenue requirement.”⁸
12

13 **Q. Please discuss the decision to make use of three year average unit costs as opposed**
14 **to five year average unit capacity related marginal costs.**

15 A. In response to Staff Data request 12-19, the witness indicated that he had compared the
16 values of the three approaches to estimating marginal costs that he had developed:
17 (a) Using the estimate of marginal costs based on three year average unit costs led to a
18 total of \$34,951,686, which was considered close to the base rate revenue requirement of
19 \$40,807,598.
20 (b) In contrast, estimates of marginal costs based on regression coefficients led to a total
21 of \$87,892, 585, well above the rate base revenue requirement.

⁷ Bates page 0544, lines 3-6

⁸ Staff data response 12-18

1 (c) Using the five-year average unit costs led to marginal costs even higher than those
2 determined by the regression analysis.

3 Thus, the witness elected to make use of the three-year average costs when determining
4 marginal cost estimates for primary, secondary and line transformer plant as it was more
5 reflective of the Company's current cost levels.
6

7 **Q. What was the company response to Staff's concern about whether given that a**
8 **significant portion of the analysis is based on costs that are historic not marginal in**
9 **nature, or utilize simple inflation based extrapolations of costs, whether the MCS**
10 **should still be considered a robust marginal cost study**

11 A. In Staff data response 12-20, the company witness asserted the following: "That (1) it
12 is common and well-accepted practice in New Hampshire and other jurisdictions to
13 estimate marginal costs using "carefully prepared" unit average costs, and (2) it is
14 appropriate to use unit average costs to estimate marginal costs if regression
15 coefficient estimates of marginal cost are unusually large and not in line with the
16 Company's total embedded cost to serve⁹." In addition, the witness cited two recent
17 cases, dockets DG 10-017, and DG 14-180, where average unit costs rather than
18 regression coefficients were utilized when preparing marginal cost studies.
19

20 **Q. How are the results of a marginal cost study used to inform rate design?**

⁹ Staff data response 12-28

1 A. Given the need to modify the class allocation based on marginal costs to make it conform
2 to the revenue requirement, four major approaches have been proposed in the literature¹⁰:

3 (a) Ramsey Pricing (Inverse elasticity rule)

4 (b) Differential adjustment of marginal cost components

5 (c) Equi-proportional adjustment of class marginal cost assignments

6 (d) Lump Sum Transfer Adjustment.

7 When considerations of efficiency, equity, rate stability and administrative feasibility are
8 considered, the equi-proportional approach is often favored since it is arithmetically
9 simple, considered highly equitable and stable over time.¹¹

10
11 **Q. How were the results of the MCS used in this rate case to develop rate design**
12 **considerations?**

13 A. In the current MCS, the Company did apply a variation of the equi-proportional
14 methodology. According to the witness, class revenue targets were based on the results
15 of the marginal cost of service study ("MCS") making adjustments using the Equi-
16 Proportional Method ("EPM") to recover the allowed revenue requirements. As shown in
17 Attachment JDS/MCS-10, the total delivery service marginal cost is \$35,406,670.50.
18 Because the total delivery service marginal cost does not equal the Company's revenue
19 requirement, the delivery service marginal cost for each rate class was adjusted on a pro-
20 rata basis using the EPM. Because the EPM method adjusts all marginal costs by a
21 uniform percentage, the marginal cost based price signals are preserved. That is, the
22 relative rate differences among the classes are preserved, but the price signals are

¹⁰ NARUC Manual (January 1992) Page 149

¹¹ NARUC Manual (January 1992) Page 160

1 somewhat distorted depending on the actual percentage change. In this context, the
2 marginal cost price signals include both the overall level of the revenue target for each
3 rate class, and the specific customer charges and variable (per kWh and per kW) rates
4 charged to the customers in each rate class. The equi-proportionally-adjusted delivery
5 service marginal costs, by rate class, were further adjusted to reflect rate design
6 considerations of continuity of rates and fairness between rate classes.

7
8 **Q. Does Staff believe that the “average” nature of the company’s marginal costs study**
9 **is a shortcoming of this filing?**

10 A. In the section of the NARUC Manual¹² addressing marginal cost studies, one notes that
11 input data used by utilities in the development of marginal cost studies are often
12 supported or based on information that is more average or current than marginal in
13 nature. According to the Manual, “Determination of marginal costs especially for
14 distribution and customer costs is much more difficult and less precise than for power
15 supply, and that it is not clear whether the benefits are sufficient to justify the effort.” The
16 Manual goes on to state that it is still common for analysts to use some variation of a
17 projected embedded methodology for these elements rather than a strictly marginal
18 approach.¹³ Staff agrees that the use of average unit costs as an alternative to marginal
19 costs derived from a regression analysis may not be necessarily wrong, but the
20 company’s approach does raise some doubts.

21 1. If the results of the regression analysis were ‘problematic’ relative to the required rate
22 base, why did the company not conduct any analysis to try to determine the underlying

¹² NARUC Manual (January 1992) Page 127

¹³ NARUC Manual (January 1992) Page 127

1 causes for its regression analysis difficulties. According the discussions with the
2 Company witness during technical sessions, Staff was informed that no such studies were
3 performed.

4 2. The Company witness stated that use of the three-year average costs as opposed to the
5 five-year average costs was determined because the five-year average unit capacity
6 related marginal costs were similar to but greater than the regression coefficient marginal
7 costs¹⁴. This suggests a level of possible subjectivity that belies the rigor of the MCS
8 analysis.

9
10 **Q. Would the rate class allocations leading to adjustments to the rate design been**
11 **different had the results of the regression analysis been utilized.**

12 A. Arising from Staff data request 12-20, the company provided a schedule (Attachment C)
13 to show the following:

- 14 (1) Company proforma normalized calendar month revenues at current rates;
15 (2) total class marginal costs based on three-year unit average costs, and
16 (3) total class marginal costs based on regression coefficients.

17 The company went on to conclude that Attachment Staff 12-20, lines 2, 4, and 6
18 demonstrate that relative class shares of normalized revenues, 3-year average unit costs
19 and regression coefficient marginal costs are very similar; lines 8 and 9 quantify that
20 similarity. Mr. Simpson concluded that based on considerations of rate continuity and
21 rate stability, both the 3-year unit average marginal costs and the regression coefficient

¹⁴ Staff data response 12-19

1 marginal costs provide appropriate and reasonable guidance in setting revenue targets in
2 this proceeding.

3 Staff agrees that relative to the percentage of total revenues by rate class arising from the
4 pro forma normalized calendar month revenues at current rates, the equivalent percentage
5 of total class marginal costs utilizing the three-year unit average and the percentage of
6 total class marginal costs utilizing the regression coefficient are quite similar. Where they
7 primarily differ is with respect to the relative percentages for Domestic Service Rate D
8 and General Service TOU Rate G-1.

9 Utilizing the three-year average unit costs would suggest a need to allocate more of the
10 marginal costs to Rate class D (an increase from 46.71% to 47.86%), whereas utilizing
11 regression analysis the allocation of marginal costs would decrease from 46.71% to
12 45.91%.

13 Similarly, for Rate class G-1, the three-year average unit cost analysis would decrease the
14 percentage marginal cost allocation from 23.02% to 22.21% whereas using the regression
15 analysis would increase the marginal cost allocation from 23.02% to 24.90%.

16 Utilizing the three-year average unit costs approach results in a limited, but greater
17 burden of revenue recovery on rate class D while reducing the burden for rate class G-1.

18 While the overall impact may be quite small, nevertheless departing from the regression
19 analysis based marginal cost approach results in a somewhat higher burden of revenue
20 recovery from the residential rate class.

21
22 **Q. What are the implications of these findings going forward?**

23 **A.** Staff would like to recommend the following going forward:

1 1. When a utility proposes to submit a marginal cost study, the burden should lie
2 with the Company to demonstrate why standard regression analysis is inappropriate in a
3 given case. It is insufficient to draw attention to ‘lumpy investment’ in the form of
4 capacity related distribution plant additions between 1997-2015, and determine that due
5 to the unusually large nature of the regression findings that utilization of the alternative
6 average unit costs will be preferable. By the witnesses’ own admission, the regression
7 analysis was rigorous¹⁵ and could have been utilized (albeit less conveniently) to adjust
8 class revenue requirements.

9 2. More rigorous diagnostic analysis of the regression results would have enabled
10 the Company to better determine the causes behind the high cost results and provided the
11 Commission with greater confidence in the results of the marginal cost study.

12 3. The Commission’s reliance on marginal cost principles for revenue allocation and
13 rate design provides an economically correct price signal, which encourages customers to
14 use electricity efficiently and to make appropriate choices when purchasing electricity
15 consuming equipment and appliances. At present there is growing interest in customer
16 sited distribution generation and demand response, and increased awareness of
17 distribution competition amongst utilities. In this environment, inefficient pricing can
18 lead to uneconomic bypass of utility facilities, resulting in unnecessary investment in
19 duplicative facilities and higher rates for remaining utility service customers. Thus, it is
20 critical that the Company adhere as much as possible to standard marginal cost based
21 methodology and limit its use of average unit costs to determine class revenues.

¹⁵ Staff data response 12-20

1 4. In this rate case, Staff recommends that Company adhere to the class revenue
2 signals as derived from the regression analysis to broadly increase the burden of recovery
3 from General Service Rate Class G-1 while concurrently decreasing the burden of
4 recovery from Domestic Rate Class D.¹⁶

5
6 **Rate design issue.**

7 **Q. Does Staff have any concerns about how the Company made use of the marginal**
8 **cost study to inform the rate design.**

9 **A.** No. The methodology utilized is well known and understood and relies on the
10 identification of current total class revenue requirements, and a comparison made
11 between class revenues and class marginal costs. Since the results of the marginal cost
12 study amounted to \$35,406,670 and the revenue target of current rates plus the Company
13 proposed revenue deficiency of \$5,328,583 amounts to \$40,807,598, the Company
14 applied an equi-proportional adjustment to the class marginal costs to close the gap while
15 at the same time seeking to preserve the marginal cost based price signals.¹⁷
16 Deviations from this approach included the exclusion of Rate M; a rate continuity cap of
17 120% of the total Company increase was applied to each class in turn, and the remaining
18 resulting shortfall of \$265,672 was subsequently allocated to all classes that were below
19 the cap by apportioning the shortfall to each of these classes in proportion to their relative
20 contribution to total company test year revenues.

21

¹⁶ Staff data response 12-20, Attachment see table entitled, “ Total Marginal Costs and Total Proforma Distribution Revenues by Rate Class.”

¹⁷ Heather Tebbetts & James Simpson, Direct Testimony. Bates page 207, line14 and following.

1 **Q. What concern does Staff have with respect to the rate design for Rate D?**

2 A. Under a provision dating back to the 1980's, utilities implemented lifeline rates for low
3 usage customers through a lower cost block for the first 250 kWh of consumption a
4 month.

5 Seeking apparent consistency with other NH Utilities, under the proposed rate design the
6 Company is proposing the eliminate the separate lower rate for the first 250 kWh of
7 usage, and to replace it with a flat energy rate for all kilowatt-hours under Rate D.¹⁸

8 In support of its approach, the Company has drawn attention to its discounted rates
9 available through the Electric Assistance Program ("EAP"), and indicated that for low
10 usage customer, under the EAP they would be able to receive a discount based on income
11 for their first 750kWh of usage to mitigate the proposed increase to the first 250 kWh
12 discount that these customers currently receive.

13 **Q. Staff data request 12-21 asked the Company whether the existing low income**
14 **customer already benefits from the EAP discount?**

15 A. The Company confirmed that currently low income customers already have access to the
16 EAP and clarified that if that customer's bill increases as a result of a proposed rate
17 change that will increase the rate for the first 250 kWh of usage per month, then the EAP
18 discount will be applied to that higher rate and partially offset its impact.¹⁹

19 **Q. Does the Staff position differ in this matter?**

20 A. Yes, while Staff understands the desirability of establishing a uniform flat rate it remains
21 concerned about the impact on the most vulnerable segment of customers. Staff
22 recommends that rather than eliminating the 250 kWh flat rate discount for lower usage

¹⁸ Heather Tebbetts & James Simpson, Direct Testimony. Bates page 214, Lines 5-12

¹⁹ Staff Data Response 12-21.

1 customers, that the Company consider phasing this change over a two-year period in
2 order to limit any short run challenges faced by low income users. Staff recommends that
3 the Company reduce the discount for the first 250 kWh of consumption for low income
4 users by half while applying the new lower flat rate for all consumption beyond that level
5 rate and retaining the 8% EAP discount across the board.

6
7 **Q. Does this conclude your testimony?**

8 **A. Yes.**
9
10