

STATE OF NEW HAMPSHIRE  
PUBLIC UTILITIES COMMISSION

DOCKET DE 19-120

IN THE MATTER OF: Liberty Utilities (Granite State Electric) Corp. d/b/a  
Liberty Utilities  
2019 Least Cost Integrated Resource Plan.

DIRECT TESTIMONY

OF

Kurt Demmer  
Utility Analyst NHPUC

January 23, 2020

1 **Q. Please state your full name.**

2 A. Kurt Demmer.

3

4 **Q. By whom are you employed and what is your business address?**

5 A. I am employed as a Utility Analyst in the Electric Division of the New Hampshire Public  
6 Utilities Commission (Commission or PUC). My business address is 21 South Fruit St.,  
7 Suite 10, Concord, NH, 03301.

8

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

10 A. I graduated from Merrimack College in North Andover, Massachusetts with a Bachelor of  
11 Science degree in Electrical Engineering in 1987. In 2002, I received a Master's degree in  
12 Electrical Engineering and Power Systems Management from Worcester Polytechnic  
13 Institute in Worcester, Massachusetts. Since 1996, I have been a registered professional  
14 engineer in the State of New Hampshire.  
15 In June 1988, I joined Massachusetts Electric Company as an Operations Field Engineer. In  
16 1996, I became a Senior Engineer for Massachusetts Electric Company. In 1999, my area of  
17 responsibility expanded to include distribution planning engineering. In 2000, I accepted a  
18 position as Area Supervisor for the Salem NH area of National Grid USA and was  
19 responsible for all distribution engineering, distribution overhead/underground/substation  
20 construction, substation operations, and warehousing in the Salem/Pelham area. In 2002, I  
21 was promoted to Superintendent of Electric Operations in the Salem/Beverly/Cape Ann  
22 Massachusetts area. As Superintendent, I was responsible for distribution engineering  
23 immediate oversight, distribution overhead/underground/substation construction, substation

1 operations, and warehousing. From 2003 to 2004, I was a project manager for a 14-mile, \$19  
2 million subtransmission 34.5kV underground distribution project consisting of manhole and  
3 duct construction housing (1) 34.5kV distribution supply circuit and (1) 34.5kV distribution  
4 circuit connecting East Beverly substation to a downtown Gloucester distribution substation.  
5 In 2005, as Superintendent of electric overhead distribution operations, I was assigned to the  
6 Merrimack Valley district area in Massachusetts. In 2008, I was promoted to Manager of  
7 Electric Operations in New Hampshire for National Grid, responsible for the operations,  
8 construction, and maintenance functions for the electric distribution organization. In 2010, I  
9 was promoted to Acting Director of Electrical Operations in New Hampshire for National  
10 Grid. In 2012, I became Director of Electrical Operations in New Hampshire for Liberty  
11 Utilities (Liberty). My continued areas of responsibility were to oversee the construction,  
12 maintenance, and operation of the electric distribution system. Since 2017, I have been  
13 employed as a Utility Analyst in the Electric Division for the Commission.

14  
15 **Q. What is the purpose of your testimony?**

16 A. My testimony in this proceeding will review and evaluate the Liberty Utilities (Liberty)  
17 limited Least Cost Integrated Resource Plan (LCIRP) submittal as required in Order No.  
18 26,261. The evaluation will determine whether Liberty complied with the Commission order  
19 and recommend next steps to the Commission for the Company's January 15, 2021 full  
20 LCIRP submittal.

1 **Q. Did Liberty file a Least cost Integrated Resource Plan (LCIRP) on July 15, 2019?**

2 A. No. Liberty requested—and was granted—a waiver of the 2019 LCIRP requirements in

3 Order No. 26,261 (June 14, 2019). That order stated, in pertinent part:

4 While we will allow Liberty to delay its LCIRP filing, we will nonetheless require  
5 a more limited filing by the Company on or before July 15, 2019. The purpose of  
6 this filing will be to ensure that Liberty is adhering to certain commitments made  
7 in its prior approved LCIRP. Our approval of Liberty’s 2016 LCIRP contained  
8 specific deliverables and we will require updates of those in Liberty’s July 15 filing,  
9 as follows:

- 10 • Confirmation that the utility is currently following the process of system  
11 planning using established procedures, criteria, and policies outlined in its 2016  
12 LCIRP, and achieving the objectives included its 2016 LCIRP.  
13  
14 • Copies of adopted standard operating procedures for employees and managers  
15 integrating day-to-day and long-term planning consistent with the Company’s  
16 objectives of Least Cost Planning.  
17

18 Instead of an LCIRP, Liberty provided a “more limited filing” pursuant to Order No. 26,261  
19 (June 14, 2019). In the testimony below, I review the Company’s more limited filing for  
20 consistency with the Commission’s direction in Order No. 26,261, and make recommendations  
21 for the full LCIRP the Company must file on January 15, 2021.

22

23 **Procedures, criteria, and policies outlined in its 2016 LCIRP**

24

25 **Q. Is the Company following the process of system planning utilizing the established**  
26 **procedures, criteria, and policies outlined in its 2016 LCIRP?**

27 A. No. Overall the planning criteria for the 2016 LCIRP and the 2019 limited filing LCIRP

28 describe similar design criteria, equipment rating criteria, and forecasting methodology,

29 however, there are additional equipment rating criteria for distribution transformers that were

1 new to the 2019 limited filing LCIRP planning criteria. There were also other strategies or  
2 procedures that were in the 2019 limited filing LCIRP that differ from the 2016 full LCIRP  
3 filing.

4  
5 **Q. What are the other procedures, policies, and criteria that are different from the 2016**  
6 **LCIRP filing?**

7 A. Items that were submitted in the 2019 limited LCIRP that are in addition to those submitted  
8 in the 2016 LCIRP include a comprehensive set of Distribution Construction Standards for  
9 overhead and underground equipment, electric operating procedures for distribution, strategy  
10 documents (DAS-1 through DAS-5),<sup>1</sup> and reliability based review processes and identification  
11 tools (DAM-012 and DAM-016).<sup>2</sup> These documents, numbered DAS-1 through DAS-15  
12 provide Liberty employees guidance on Liberty's asset management strategy on numerous  
13 distribution field assets. Since most of the strategy documents are revised National Grid  
14 documents, Staff requested the original or pre-2016 versions of the strategy documents in Staff  
15 3-15. A majority of the strategy documents have been revised in either 2018 or 2019 . It appears  
16 that DAS-010 is a new strategy document (Poor Performing Feeder Strategy) released in June  
17 2019. In addition to the revised and new Strategy documents, DAM-012, Engineering  
18 Reliability Review Process is also a new strategy document released in June 2019.

19

20 **Standard Operating Procedures for Employees and Managers**

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<sup>1</sup> Docket No. DE 19-120. Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities Least Cost Integrated Resource Plan, Attachment 1

<sup>2</sup> *Id.*

1 **Q. Did the Company provide copies of adopted standard operating procedures for**  
2 **employees and managers integrating day-to-day and long-term planning consistent with**  
3 **the Company's objectives of Least Cost Planning?**

4 A. The Company provided the documentation described in the answer above, however the  
5 Company's filing in Docket No. DE 19-120 is missing certain key documents which would have  
6 shown whether the Company's standards and operating procedures for employees and managers  
7 integrate day-to-day and long-term planning consistent with the Company's objectives of Least  
8 Cost Planning.

9  
10 **Q. Please describe the missing documentation.**

11 A. As part of the construction standards, operating policies, and procedures, there are also  
12 substation maintenance procedures (SMP) and substation maintenance standards (SMS). These  
13 procedures and standards, which were developed by National Grid to adequately maintain  
14 substation assets, are an essential resource for Liberty to benchmark asset performance and  
15 gauge substation asset condition. During the Liberty Technical Session held November 26,  
16 2019, the Company discussed the ongoing revisions or modifications to the original SMP and  
17 SMS documents as the substation department takes on more of the substation tasks.

18  
19 **Q. What is the significance of not receiving all of the 2019 Limited Filing LCIRP**  
20 **deliverables at this time?**

21 A. As stated in Order No. 26,039, it is imperative for the Company to include adopted standard  
22 operating procedures for employees and managers integrating day-to-day and long-term planning

1 consistent with the Company's objectives of Least Cost Planning.<sup>3</sup> The lack of updated or  
2 adopted SMS and SMP indicates a disconnect between substation asset evaluation and the least  
3 cost planning process. Furthermore, Order No 26,261 requires the Company to submit all of the  
4 Company's adopted standard operating procedures for employees and managers.

5  
6 **Q. Is there a concern with Liberty's existing planning criteria?**

7 A. Liberty addresses a change in design criteria in its 2016 and limited 2019 filing.. It states  
8 "Liberty Utilities has refined the distribution planning criteria to better fit Liberty's strategy and  
9 scale of facilities. These refinements...reflect Liberty's strategy of having sufficient capacity  
10 available to meet changes in demand, including new customer demand, to improve operations  
11 during emergency conditions, and to allow more time for the planning, analysis and construction,  
12 as needed, of new facilities. In addition the refinements reflect the operating parameters of  
13 Liberty's smaller distribution footprint and resource base."<sup>4</sup>  
14 Liberty's scale of facilities, similar to other New Hampshire Investor Owned Utilities (NH IOUs)  
15 is proportional to its customer base. Less customers typically equate to less distribution circuits,  
16 substations, and resources. Conversely, as the customer count increases and load increases, the  
17 distribution system that serves those customers also increases. This assumes a similar mix of  
18 geographical topography, customer class, and load density (i.e. rural vs. urban density). Liberty,  
19 Eversource, and Unitil have both rural and urban areas. Liberty's design criteria is significantly  
20 lower for normal loading than other NH investor owned utilities. Adopting a "take action" step  
21 at 75% rather than 100% of the equipment's continuous rating equates to a premature

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<sup>3</sup> Order No. 26,039 at 5-6. (July 10, 2017)

<sup>4</sup> Docket No. DE 19-120. Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities Least Cost Integrated Resource Plan. Attachment 2, Bates page 0142.

1 replacement of distribution and substation equipment, which is not necessary as the equipment is  
2 rated for 25% more loading.

3 Liberty's assessment of the lowered design criteria as necessary to allow more time for planning,  
4 analysis, and construction of new facilities does not align with Liberty's PSA forecast at the  
5 system level or township level. Liberty's Final Seasonal Peak Forecast 2018-2034 dated January  
6 2019 lists a summary of results for Liberty's NH service territory. Table 1 indicates a -0.42%  
7 average growth rate for 2013-2017 summer weather adjusted peak loads. Table 2 indicates a  
8 0.36% average load growth rate for 2020-2024 summer peak loads assuming normal weather.  
9 The largest average load growth for 2020-2024 at the township level is 1.04% average load  
10 growth rate for 2020-2024 summer peak loads assuming normal weather in the Derry  
11 Township.<sup>5</sup> There are spot loads 300kVA and larger that Liberty adds to the future forecast  
12 when planning load forecasts annually, however considering that past spot loads are now  
13 embedded in the historical load growth, spot loads typically are not significantly changing the  
14 peak loads.

15

16 **Q. Are there other criteria that Liberty should reevaluate as part of the normal loading**  
17 **concerns?**

18 A. Liberty's equipment rating criteria also is more conservative than National Grid and the other  
19 NH IOUs. The Long Term Emergency (LTE) load rating relies on the type of asset that is  
20 limiting the circuit as well as the duration.

21

22 **Q. Can Staff provide an example of these conservative rating criteria?**

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<sup>5</sup> Attachment KFD-1. Docket No. DE 19-120, Staff Data Request 1-003a3. Page (21) of (47)

1 A. For example, the LTE load rating for overhead conductors is based on a 24-hour duration with  
2 an elevated temperature of the conductor not to exceed 90°C, however, bare wire may  
3 accommodate a higher temperature without risking safety or reliability. For circuits where the  
4 LTE rating is based on an overhead conductor, the current LTE rating may not accurately  
5 represent available additional capacity for restoration during a first contingency event. While I  
6 recognize that other factors that may limit the temperature range of bare conductor (e.g. pole top  
7 insulator temperature restrictions and clearances to other conductors as the conductor sag  
8 increases), a higher temperature range and resultant increased LTE rating for applicable circuits  
9 during contingencies may result in less load at risk and fewer requirements to upgrade the  
10 infrastructure at a higher cost.

11

12 **Q. What is the correlation between the risk assessment and Liberty's contingency load at**  
13 **risk design criteria?**

14 Liberty presently does not utilize risk assessment software, however the Megawatt (MW) and  
15 Megawatt-hour (MWhr) contingency load at risk should, at a minimum, reflect the actual risk  
16 and impact that a substation transformer, subtransmission line, and distribution feeder  
17 contingency presents. The existing Liberty design criteria is more conservative than its  
18 predecessor, National Grid, and is far more conservative than the other NH IOUs. Refer to Table  
19 1 below for planning criteria comparisons:<sup>6</sup>

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<sup>6</sup> Docket No. DE 19- 064 Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities Petition for Permanent Rates Distribution Service Rate Case. Direct Testimony of Kurt Demmer, Bates page 000013, "Table 1".

1

Table 1 Comparison of Planning Criteria and Forecasting Methodology			
Liberty Utilities	National Grid	Eversource (See Note)	Unitil
<b>Normal Operations</b>			
Distribution feeders to remain within <u>75%</u> of normal ratings.	Distribution Feeder to remain within <u>100%</u> of normal ratings	Distribution Feeder to remain within <u>100%</u> of normal ratings	Distribution Feeder to remain within <u>100%</u> of normal ratings
Subtransmission lines to remain within <u>90%</u> of normal ratings.	Subtransmission lines to remain within <u>100%</u> of normal ratings	Subtransmission lines to remain within <u>100%</u> of normal ratings	Subtransmission lines to remain within <u>100%</u> of normal ratings
Substation transformers to remain within <u>75%</u> of normal ratings.	Substation transformers to remain within <u>100%</u> of normal ratings	Substation transformers to remain within <u>100%</u> of TFRAT ratings with an 85% TFRAT rating identification	Substation transformers to remain within <u>100%</u> of normal ratings
<b>First Contingency (N-1) Operations</b>			
For loss of a distribution feeder, with no more than <u>16MWhr</u> load at risk during peak loading	For loss of a distribution feeder, with no more than <u>16MWhr</u> load at risk during peak loading	N/A	N/A
For loss of a subtransmission line, load at risk after switching is no more than <u>1.5 MW</u> . No more than <u>36 MWhr</u> load at risk during peak loading	For loss of a subtransmission line, load at risk after switching is no more than <u>20 MW</u> . No more than <u>240 MWhr</u> load at risk during peak loading	For loss of a subtransmission line, load at risk after switching is no more than <u>30 MW</u> . No more than <u>720 MWhr</u> load at risk during peak loading	For loss of a subtransmission line, load at risk after switching is no more than <u>30 MW</u> . No more than <u>720 MWhr</u> load at risk during peak loading
For loss of a substation transformer, load at risk after switching is no more than <u>2.5 MW</u> . No more than <u>60 MWhr</u> load at risk during peak loading	For loss of a substation transformer, load at risk after switching is no more than <u>10 MW</u> . No more than <u>240 MWhr</u> load at risk during peak loading	For loss of a substation transformer, load at risk after switching is no more than <u>30 MW</u> . No more than <u>720 MWhr</u> load at risk during peak loading	For loss of a system supply substation transformer, load at risk after switching is no more than <u>30 MW</u> . No more than <u>720 MWhr</u> load at risk during peak loading
<b>Other First Contingency (N-1) Design Criteria</b>			
In general, and whenever practical, each distribution feeder should have 3 feeder ties to adjacent circuits	Circuits shall tie to neighboring circuits as much as practical as the flexibility to reconfigure feeders has a positive reliability impact for a wide range of possible	N/A	N/A
Distribution circuits should be limited to 2,500 customers and sectionailed such that the number of customers does not exceed 500 or 2,000 KVA of load between disconnecting devices	N/A	N/A	N/A
<b>Load Forecasting Methodology</b>			
Load forecast is based on econometric models and updated annually. It is developed on both weather normalized and weather probabalistic basis on both a system level and a Planning Study Area (PSA) level. The following year (Year 1) forecast is based on an extreme weather forecast which is a 95/5 forecast. Known spot loads are added to the PSA forecast after the forecast has been determined.	Load forecast is based on econometric models and updated annually. It is developed on both weather normalized and weather probabalistic basis on both a system level and a Planning Study Area (PSA) level. The following year (Year 1) forecast is based on an extreme weather forecast which is a 95/5 forecast. Known spot loads are added to the PSA forecast after the forecast has been determined	The maximum Peak Load Forecast shall be based upon the highest recorded peak within the previous five years where consecutive days of 17 cooling degree days occurred. Each Operating area has separate peak load forecast based on spot load increases and New Hampshire Coop / Unitil Load forecasts	Load forecasts are developed using a linear trend regression model that correlates a 10-year history of daily peak load versus daily average temperature and humidity. A Monte Carlo simulation is utilized to produce a range of peak load possibilities. Peak Design load is used for system infrastructure adequacy and contingency studies. Peak Design load is a 90/10 forecast.

2

3 **Staff Recommendations and Expectations for the 2021 LCIRP**

4

5 **Q. Does Staff have any recommendations related to the Company’s distribution capital**  
 6 **projects and least cost planning?**

7 A. For the next LCIRP due January 2021, Liberty should provide the level of detail and

8 transparency into least cost planning, planned capital projects, circuit level load forecasts, and

1 current system visibility that Unitil provided in its 2016 LCIRP and Attachments in Docket No.  
2 DE 16-463. This would include any recently completed capital plans, area planning studies, ten-  
3 year circuit level loading criteria and forecasts, and an evaluation of planned investments and  
4 potential least cost alternatives.

5

6 **Q. How does the Company plan to satisfy its obligation under Order No. 26,207?**

7 A. When asked whether the Company would provide a grid needs assessment within its next  
8 LCIRP, the Company stated that it would file such an assessment in its next LCIRP, which would  
9 be due to the Commission on or before June 19, 2020 absent intervening Commission action.<sup>7</sup>

10

11 **Q. What is Staff's recommendation for risk evaluation in Liberty's planning and design**  
12 **criteria?**

13 Liberty's planning and design criteria for the assets that have the probability for a larger impact  
14 should be consistent with the other NH IOUs while still evaluating the actual probability and  
15 impact of each significant contingency event. The 30MW/720MWh load at risk should be  
16 considered as a first step. Mitigation of contingencies such as portable transformers, emergency  
17 portable generation, and access enhancement should be considered before significant capital  
18 investment is employed.

19

20 **Q. Does this recommendation extend to the 16MWh first contingency design criteria for**  
21 **distribution circuits?**

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<sup>7</sup> Attachment KFD-2, Docket No DE 19-120, Staff Data Request 1-001.

1 A. No, it does not. The impact and likelihood of a distribution circuit outage does not warrant a  
2 specific load at risk criteria. Distribution circuits vary too much in their layout and level of  
3 complexity to provide backup configurations, criticality of load, and circuit design. The 16MWh  
4 criteria is a guideline and should not be part of a criteria that requires a costly solution to resolve.

5  
6 **Q. What is Staff’s position on the Company’s planning criteria as it relates to this limited**  
7 **filing and the proposed January 2021 full LCIRP filing?**

8 A. Staff does not support the planning criteria as submitted in the Company’s 2016 LCIRP and  
9 2019 limited filing. Staff recommends the following planning or design criteria changes:

- 10 • Liberty change the existing 75% “take action” criteria and use the 75% as a “take notice”  
11 criteria. The change will allow planners and engineers ample time to identify a future  
12 risk and plan accordingly. A “take notice” identified asset will be on an annual watch  
13 list to ensure that there is sufficient time to mitigate or eliminate a future issue if or when  
14 the asset approaches 100%.
- 15 • Rerate or adjust the LTE rating to reflect the contingency violation as well as evaluate  
16 any limiting asset for increased temperature capabilities.
- 17 • Outage contingency load at risk should accurately reflect the risk or probability of failure  
18 as well as impact and cost to either mitigate or eliminate that risk. This load at risk  
19 should align with other NH investor owned utilities (IOUs).
- 20 • Feeder criteria, such as number of customers per feeder and outage contingency load at  
21 risk, should be further evaluated as guidelines rather than investment planning criteria.

22 Staff recommends that the Commission require the Company to suspend any investments arising  
23 from the planning criteria and methodology changes that have been made in the 2016 LCIRP

1 Docket DE 16-097 and the 2019 limited filing until approval of the Company's next full LCIRP,  
2 which is due to be filed in January 2021. During that proceeding, the Company should provide  
3 Staff the necessary justification and documentation required for the modifications, additions, or  
4 deletions, to the planning criteria, policies, procedures, and methodologies.

5

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

7 A. Yes.