Unitil
Unitil Service Corp.

May 2, 2005

VIA OVERNIGHT MAIL

Ms. Mary L. Cottrell, Secretary
Department of Telecommunications and Energy
One South Station, 2nd floor
Boston, MA 02110

Re: Investigation by the Department Regarding Service Quality Guidelines Established in Service Quality Standards for Electric Distribution Companies and Local Gas Distribution Companies, D.T.E. 04-116

Dear Secretary Cottrell:

Enclosed for filing on behalf of Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil"), please find an original and one (1) copy of Unitil's responses to the Department's first set of information requests in the above-referenced docket. As requested, copies of Unitil's responses are being sent by e-mail to the parties.

Thank you for your attention to this matter.

Sincerely,

Gary Epler

Enclosure

cc: Jody M. Stiefel, Hearing Officer

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Request No. DTE-A 1-1

Regarding customer notice and customer service guarantees, please describe the following:

a) the process that should be required (1) to ensure accurate notification of planned interruptions to customers on the affected circuit, and (2) to accurately track and provide a customer credit to all affected customers of record; and

b) any proposed new process to ensure accurate appointment notification, rescheduling appointment, and credit for service appointment service guarantee.

Response:

a) Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil") submits that its current system for notifying customers of planned interruptions is sufficient for ensuring accurate notification of its customers. Unitil makes every effort to ensure its customers are informed of all planned non-emergency outages in advance. Unitil uses its customer information system to determine which customers will be affected by a planned outage. Once the area that will be affected is identified, Unitil queries the database, utilizing the meter reading sequence number, to determine affected customers and mails an outage notification to each customer describing the outage date and duration, as well as an alternative date in case of inclement weather. In order to provide customers with sufficient advance notice, notifications are mailed no more than 14 days before and in no case less than 7 days prior to the scheduled outage date. Since Unitil is using its most up-to-date records to notify customers of planned outages, it expects that all customers are being notified. If a customer does not receive notification through this process, Unitil will only be made aware if the customer calls. Therefore, for missed notifications of planned non-emergency outages, Unitil recommends that payment be made to the customer only when the customer requests the credit.

b) Unitil believes that its present procedure to insure appointment notification, rescheduling and crediting is sufficient, and does not, at this time, propose any new processes. The Company is, however, evaluating the addition of an automatic appointment reminder system. Currently, Unitil representatives verbally communicate the mutually agreed upon service appointment to the customers requesting the service work. Unitil makes every effort to keep appointments as originally scheduled; however, if an appointment must be rescheduled, Unitil verbally notifies the customer and establishes a new mutually agreed upon appointment. Unitil is evaluating utilizing its Interactive Voice Response system to perform reminder notifications (i.e. 24 hours prior to the appointment) to ensure customers are given all opportunities to keep the appointment. Unitil makes payment of the $25 customer guarantee for missed service

appointments upon the customer's request. Upon that request, Unitil makes a credit adjustment to the customer's account which will be reflected in their next bill. .

Person Responsible: Mark Lambert **Date:** May 2, 2005

Request No. DTE-A 1-2

Regarding standardization of service quality benchmarks, please identify those service quality measures that could be standardized on a state-wide basis. Explain.

Response:

As previously stated, there are significant limitations, in terms of validity and applicability, of using national, regional and statewide data to establish uniform or comparative performance benchmarks. There are inherent differences among utilities in terms of data-collection methods, data quality, geography, distribution system design and configuration and weather impacts that make it extremely difficult to establish standardized performance benchmarks that would have validity in terms of measuring (and penalizing) the performance of a specific Massachusetts-based utility.

These differences are significant because it is not possible to make comparisons among utilities if, for example, they are not computing the performance statistics in the same way, or are not operating under the same economic, business and natural environments. It would be cost prohibitive for all utilities to establish uniform benchmarks due to the differing operational, demographic and geographic challenges that each utility faces. None of these considerations have changed in the three years since the Department's ruling in D.T.E. 99-84. Although the Department and various industry groups have made progress in terms of the standardization of performance measures through the adoption of common definitions and data-collection practices, nothing has occurred since the filing of the Benchmarking Report to change the fact that the only feasible and analytically sound approach to evaluating a utility's performance is to compare its current performance to its past performance.

Standardized benchmarking on a state-wide basis begins with consistent definitions; however, that is not all that is required. The Department has made significant strides in standardizing the definitions so all utilities are reporting on the same basis. However, performance of a utility is based upon factors that are company specific. For instance, on-cycle meter reading is very difficult to measure from one utility to another. Factors such as number of meters, customer density, size of labor force, and overall size of franchise area are the physical constraints. A company which may have installed an automated meter reading system would tend to perform at a higher level than a company which continues to manually read individual meters, though the latter company may be conducting its meter reading in an exemplary manner.

Technology can have a major impact on many of the service quality standards (telephone service factor, on-cycle meter reading, SAIDI, SAIFI, CAIDI, billing adjustments, etc.). The comparison of a utility that has implemented certain technology

to a company that has not will not necessarily yield an accurate performance appraisal. Technology is only one of the many factors that differ amongst the utilities.

Person Responsible: Mark Lambert and Kevin Sprague **Date:** May 2, 2005

Request No. DTE-A 1-3

Please refer to the existing Service Quality Guidelines, Attachment 1, at 15-16, where the electric distribution companies are required to report outage information.

a) Comment on whether the required outage information in the Service Quality Guidelines is adequate and correlates to the outage information that local electric distribution companies maintain and use for calculating service quality calculation, including system average interruption duration index ("SAIDI"), system average interruption frequency index ("SAIFI"), customer average interruption frequency index, and momentary average interruption frequency;

b) If the required outage information is not considered adequate, please provide a list of additional outage information that would be necessary to correlate to the outage information used in the service quality calculation.

Response:

Unitil believes that the information provided in these reports is adequate and consistent with its calculation of SAIDI and SAIFI for the entire system. Unitil's outage information system stores up-to-date information on outages, but relies on a manual entry of customer counts. Unitil utilizes a separate customer information system to gather the number of customers served for any given month. The monthly customer numbers are then averaged to calculate the annual average number of customers served. This information is not required to be provided in the existing Service Quality Guidelines, Attachment 1, at 15-16, but is used to calculate SAIDI and SAIFI.

Unitil does not collect the necessary information to calculate the momentary average interruption frequency index. This information would be difficult and costly to gather because there are multitudes of devices on each circuit and throughout the system which have the capability of providing automatic reclosing in an effort to avoid a sustained outage. Additionally, most of these devices do not record the date and time of the event. In order to capture this type of information, a utility would have to upgrade every device with the capability to record the details of an event, as well as initiate a program to retrieve and store this information. This equipment upgrade would be extremely costly.

Person Responsible: Kevin Sprague **Date:** May 2, 2005

Request No. DTE-A 1-4

Regarding the IEEE Standard 1366-2003, please explain:

a) its level of conformance to the level of minimum performance required under the existing Service Quality Guidelines, i.e., performance level should not be below those levels that existed in 1997 or the existing SAIDI and SAIFI benchmarks;

b) whether this proposed IEEE standard meets the statutory requirement of minimum performance measurements; and

c) whether this standard provides an incentive for local electric distribution companies to avoid minimizing interruption durations once the threshold hits a low point and window for the excludable events increase.

Response:

a) The application of the IEEE 1366-2003 standard would not be consistent with the current approach to measuring reliability as outlined in the Service Quality Guidelines. Fitchburg Gas and Electric Light Company d/b/a Unitil would recommend the development of new benchmarks if the IEEE 1366-2003 methodology were adopted. Essentially, this criterion is a different "measuring stick" for reliability performance. Under the present Service Quality Guidelines, events which affect more than 15% of the customers (or other catastrophic even criteria) are excluded from the Annual Service Quality filing. Under the IEEE 1366-2003 methodology, data is segregated into two categories: 1) day-to-day type of outages (those less than 2.5 beta); and 2) Major Event Days ("MED"). The MED methodology segregates events that are greater than 2.5 beta. The MED threshold includes both number of customers and outage duration in the statistical analysis.

The IEEE methodology does not "exclude" any data. The methodology established in IEEE 1366-2003 requires the recalculation of the 2.5 beta threshold annually for the past 5 years, creating a rolling reference point for categorizing outages. This annual change would be different from the Service Quality Guideline approach of establishing a single historical reference and would create a situation where it would be impossible to compare the everyday outages on a basis similar to outages measured under the Service Quality Guidelines.

The IEEE methodology is arguably the more accurate mathematical approach to analyzing reliability since it does normalize the data. The challenge it presents is how to handle the changing threshold of the 2.5 beta calculation for major event days. This might be resolved by taking a modified approach to IEEE 1366-2003 where the utilities would set a benchmark 2.5 beta threshold based upon the Service Quality Guideline benchmark timeframe and not change it for Annual Service Quality reporting.

Unitil is concerned about implementing a new standard without having further discussion and study of the implications. Unitil would suggest the development of a working group to explore the issues surrounding the IEEE 1366-2003 methodology and its application for benchmarking purposes prior to a final decision.

b) As stated above, the IEEE 1366-2003 methodology provides a mathematical approach to segregating data based upon day-to-day and MED performance categories based on a rolling 5-year history. This approach is contrary to the approach of establishing historical benchmarks. However, this methodology does not "exclude" data. It just segregates the data for analysis and reporting purposes. Unitil recommends further study on this question to determine if the methodology would meet the statutory requirement of minimum performance measurements.

c) The IEEE 1366-2003 methodology does not "exclude" any data. The data is segregated for analysis purposes so that daily response to outages can be segregated and analyzed separately from larger scale events.

In NSTAR's Reply Comments, April 5, 2005, there was some concern that the IEEE 1366-2003 methodology would allow the company to manage events into a MED classification. In the longer term, however, Unitil believes that this type of restoration response would have a result of flattening out the normal curve and thus migrate the 2.5 beta threshold further away from the mean. This would result in fewer events above the 2.5 beta MED classification and also increase the day-to-day SAIDI and SAIFI performance. It may be more difficult under the IEEE 1366-2003 methodology to manage events into the MED classification due to the "self-correcting" mechanism.

As stated above, Unitil does not believe that all of the factors have been analyzed and considered with respect to the adoption of IEEE 1366-2003. The adoption of this standard may require different benchmarks and incentives, but without further analysis and discussion, it is difficult to determine the effects.

Person Responsible: Kevin Sprague **Date:** May 2, 2005

Commonwealth of Massachusetts
Department of Telecommunications and Energy
Investigation Into Service Quality Guidelines
Docket No: D.T.E. 04-116
Department Staff's First Set of Information Requests to
All Electric Local Distribution Companies

Request No. DTE-LDC 1-1

Under the existing Service Quality Guidelines, each electric distribution company reports line losses. For example, MECo reports line loss in terms of energy losses for its entire system on a monthly basis. Please provide peak megawatt ("MW") loss separately at each voltage level, such as 345 kV to 120/240 kV, and calculate as a percentage of your annual system peak. In addition, please provide the method used to calculate these losses.

Response:

Fitchburg Gas and Electric Light Company d/b/a Unitil uses the following primary and secondary voltage classes to serve customers:

Primary Voltages: 115kV, 69kV, 13.8kV and 4.16kV
Secondary Voltages: 120/240V, 120/208V and 277/480V

An analysis was completed to estimate the line losses at each voltage level. Unitil is having difficulty estimating the secondary voltage losses for the entire system as discussed below. Unitil experienced a system peak of 94.15 MW on August 30, 2004 at 17:00. All of the load and loss information used in this analysis assumed 2004 peak loading conditions. The breakdown of system losses at each voltage level is shown in the table below.

	Losses (MW)	% of System Peak	Notes
System Peak Load	94.150		
115kV Transformer Losses	0.119	0.13%	Includes the 115kV-69kV transformers at Flagg Pond
69kV Line Losses	1.055	1.12%	Includes the 69kV distribution lines
13.8kV Transformer Losses	0.421	0.45%	Includes 69kV - 13.8kV transformers
13.8kV Line Losses	3.375	3.58%	Includes all 13.8kV distribution circuits
4kV Transformer Losses	0.047	0.05%	Includes all 69kV - 4kV transformers
4kV Line Losses	0.372	0.40%	Includes all 4kV distribution circuits
Secondary Line Losses	N/A	N/A	Includes distribution transformers, secondaries, services, and meter losses
Total	5.389	5.72%	

The 115kV – 69kV transformer losses were estimated using loadflow analysis. The loads in the model were scaled to meet the 2004 system peak load conditions. The losses were calculated by the power flow software representing the no-load and load

losses of the transformers at the given load level. The load flow software is a one line approach and assumes balanced loading on all three phases.

The 69kV line losses were calculated using the same load flow model. These losses represent the i^2R losses associated with the distribution lines. These lines do not serve any load directly, but they do serve 69 kV – 13.8kV and 69 kV – 4 kV distribution substations.

The 69 kV – 13.8kV and 69kV – 4kV transformer losses were calculated using the same load flow model. These losses represent the no-load and load losses of the transformers at the given load level.

The 13.8kV and 4kV distribution circuits supply the customer load. The 13.8kV distribution circuits serve approximately 93% of the overall load and the 4kV circuits serve approximately 7% of the overall system load. Line losses for the distribution circuits were developed in a different manner. A 10% sample of distribution circuits were modeled using circuit analysis software. The loads used for this analysis are only an approximation because Unitil does not have time-stamped load data for most of the distribution circuits. Unitil uses thermal demand ammeters to gather monthly peak demand load information on their distribution circuits. The non-coincident 2004 peak loads were scaled to calculate an approximation of coincident loads at the time of system peak. These loads were then applied to the circuit model. Load was allocated to the model proportionately based upon connected transformer kVA. Losses were calculated from the model and represent the i^2R losses associated with the 13.8kV and 4kV distribution circuits. For each of the circuits, a loss-to-load ratio was calculated. This loss-to-load ratio was averaged by the 13.8kV and 4kV voltage classes to come up with an average loss-to-load ratios for each voltage class used to calculate an estimated amount of losses for each circuit. The sum of the losses for each voltage class was then compared to the system peak load to calculate an estimated percent loss.

Unitil has no direct means to calculate losses at the customer voltage level (120/240V, 12/208V and 277/480V). In order to estimate these losses, there are many assumptions that would be required. Some of the assumptions required would be: 1) X/R ratio of the service transformers; 2) diversity of customer load; 3) power factor of customer load; coincidence factor; 4) length and size of service; and 5) meter losses. The number of assumptions required to estimate these losses would result in a poor approximation of the actual conditions; therefore, Unitil did not break the system losses down for these secondary voltages.

In the most recent Annual Service Quality Report filing, Unitil reported a 2004 line loss of 5.4%. This represents the average line losses over the entire year. The calculations provided in this response would tend to represent the worst conditions as the losses at system peak conditions would be expected to be greater than the average losses over the course of the year.

The calculations used in this analysis require many assumptions. The calculations shown here are only broad estimates of the actual conditions at the time of system peak. Due to the inherent inaccuracy of the assumptions, Unitil does not recommend using this approach to measure service quality. Unitil does recommend continuing to use the present approach of calculating and reporting line losses in terms of energy losses for its entire system. This approach provides the average line losses over the given reporting period. If the calculated line losses were to change substantially in comparison to historical data, this might indicate that the 1) overall customer and system load power factor has changed, 2) load profile has changed, 3) system configuration has changed, 4) system equipment has changed, or 5) other load or system related changes.

Person Responsible: Kevin Sprague **Date:** May 2, 2005

Commonwealth of Massachusetts
Department of Telecommunications and Energy
Investigation Into Service Quality Guidelines
Docket No: D.T.E. 04-116
Department Staff's First Set of Information Requests to
All Electric Local Distribution Companies

Request No. DTE-LDC 1-2

Refer to the Initial Comments of Massachusetts Electric Company and Nantucket Electric company ("MECo") at 15-16, Att. 1, where MECo discusses discrepancies between indices collected using paper-based outage data collection systems verses mature/automated outage data collection and management systems. Please indicate:

a) whether this type of discrepancy applies to your company's outage data collection and management systems; and,

b) whether the existing fixed SAIDI and SAIFI benchmarks are a true representation of your company's historical performance, and whether these existing benchmarks should be revised. If so, also propose new benchmarks.

Response:

Fitchburg Gas and Electric Light Company d/b/a Unitil uses a paper-based outage data collection system. Trouble reports are filled out by the field personnel and submitted to office personnel after the outage is restored. The office personnel enter all of the trouble report information into an outage database which is used for querying data to develop reports and calculate reliability indices.

The outage database has been programmed with data quality controls. For instance, the outage database will not allow outages to be entered into the system without having all of the required data. In addition, the streets are correlated with the circuits and the circuits are correlated with the towns that they serve. These quality controls have enabled Unitil to gather accurate information on all of its outages.

Customer count information is taken from the customer information system ("CIS"). Each account number has an address and circuit number associated with it. This information is kept up-to-date and used to determine the number of customers affected for every interruption. This approach provides an accurate and consistent approach to reporting reliability data. As commented in DTE-A 1-3, Unitil's CIS system is not "linked" to the outage database, so average customer counts are manually entered into the outage system. This active link between systems is being explored for future implementation of an active outage management system in conjunction with automated meter reading and graphical information system ("GIS") efforts currently being considered. The extent and timing of these information system projects has not been fully determined at this point in time.

Unitil believes that this approach provides an accurate representation of the company's historical performance.

Person Responsible: Kevin Sprague **Date:** May 2, 2005