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December 27, 2023

VIA ELECTRONIC MAIL

Luly E. Massaro, Commission Clerk
Rhode Island Public Utilities Commission
89 Jefferson Boulevard
Warwick, RI 02888

RE: Docket No. 3628 – Service Quality Plan
The Narragansett Electric Company d/b/a Rhode Island Energy's Proposed Revisions to the Service Quality Plan

Dear Ms. Massaro:

In compliance with the Rhode Island Public Utilities Commission's (the "Commission") September 27, 2023 Open Meeting motions and votes approving with conditions the Company's Advanced Metering Functionality ("AMF") Business Case (the "Decision"), issued in Docket No. 22-49-EL, The Narragansett Electric Company d/b/a Rhode Island Energy ("Rhode Island Energy" or the "Company") submits its proposed updated Service Quality Plan.[1] In this filing, the Company respectfully requests that the Commission make the following rulings:

1. Approve the proposed updated Service Quality Plan;
2. Approve the Company's proposal to file a proposed target and thresholds for the updated Customer Satisfaction service quality adjustment within four months of the start of meter installation; and
3. Make any such other rulings as may be just and proper under the circumstances.

In support of this request, the Company is submitting the Joint Pre-Filed Direct Testimony of Carrie Gill and Philip J. Walnock, which includes a Technical Appendix as Schedules 1 and 2, and the proposed revised Service Quality Plan in redline and clean format as Schedules 3 and 4, respectively. Through the testimony and supporting schedules, the Company explains how it has complied with the Commission's requirement from paragraph 14 of the Decision to "engage with the [Division of Public Utilities and Carriers] to negotiate the details and implementation of . . . [five new and/or revised] service quality mechanisms and file an updated Service Quality Plan for Commission review and approval in Docket 3628 within 3 months." For the reasons set forth in the

[1] Per communication from Commission counsel on October 4, 2021, the Company is submitting an electronic version of this filing followed by hard copies filed with the Clerk within 24 hours of the electronic filing.

testimony and Technical Appendix, the Company respectfully requests that the Commission make the requested rulings.

Thank you for your time and attention to this matter. If you have any questions, please contact me at 401-457-5164 or Jennifer Hutchinson at 401-316-7429.

Very truly yours,

Adam M. Ramos, Esq.

Enclosures

cc: Docket No. 3628 Service List
Docket No. 22-49-EL Service List

CERTIFICATE OF SERVICE

I certify that a copy of the within documents was forwarded by e-mail to the Service List in the above docket on the 27th day of December, 2023.

Adam M. Ramos, Esq.

The Narragansett Electric Company d/b/a Rhode Island Energy
Docket No. 3628 Electric Service Quality Plan (SQA)
Service list updated 11/6/2023

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The Narragansett Electric Company d/b/a Rhode Island Energy
Docket No. 22-49-EL Advanced Meter Functionality (AMF)
Service list updated 7/24/2023

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THE NARRAGANSETT ELECTRIC COMPANY
d/b/a Rhode Island Energy
RIPUC Docket No. 3628
Re: Service Quality Plan
Witnesses: Gill and Walnock

JOINT PRE-FILED DIRECT TESTIMONY

OF

CARRIE GILL

AND

PHILIP J. WALNOCK

December 27, 2023

Table of Contents

I. Introduction

Carrie Gill

Q. Dr. Gill, please state your name and business address.

A. My name is Carrie Gill. My business address is 280 Melrose Street, Providence, Rhode Island 02907.

Q. By whom are you employed and in what position?

A. I am employed by The Narragansett Electric Company d/b/a Rhode Island Energy ("Rhode Island Energy" or the "Company") as Senior Manager of Electric Regulatory Strategy within the External Affairs team. In this role, I am responsible for general regulatory matters, policy development, and filings, including providing strategic support to inform business decisions that advance safe, reliable, and affordable electric distribution service.

Q. Please describe your educational background and professional experience.

A. I received a doctorate in environmental and natural resource economics from the University of Rhode Island in 2017, masters degrees in business administration and oceanography from the University of Rhode Island in 2010, and a bachelor of science in physics and mathematics from Loyola University, Maryland in 2007.

Prior to my role with Rhode Island Energy, I served in multiple positions with the Rhode Island Office of Energy Resources from 2017 to 2022, culminating my tenure as chief economic and policy analyst. In that role, I provided strategic oversight of clean energy and climate policies and programs for the State of Rhode Island. Prior to 2017, I held various research and teaching assistantships within the University of Rhode Island (2012-2017); provided independent consulting to a solar thermal developer in Washington, DC (2012); served as a Knauss Fellow within the U.S. Department of Energy's Wind and Water Power Program (2011-2012); and supported the Coastal Resources Center with research on coastal community climate adaption (2010).

Q. Have you previously submitted testimony on behalf of Rhode Island Energy?

A. Yes, I testified on behalf of Rhode Island Energy in Docket No. 23-47-EE (System Reliability Procurement), Docket No. 23-05-EL (Tariff Advice to Amend the Net Metering Provision), Docket No. 22-56-EL (Grid Modernization Plan), and Docket Nos. 23-44-REG and 22-39-REG (Renewable Energy Growth Program).

<u>Philip J. Walnock</u>

Q. Mr. Walnock, please state your name and business address.

A. My name is Philip J. Walnock. My business address is 2 North 9th Street, Allentown, Pennsylvania 18101.

Q. By whom are you employed and in what position?

A. I am employed by PPL Services Corporation, a subsidiary of PPL Corporation ("PPL"), and I currently hold the position of Director, Product Portfolio – Field Operations & Metering. My responsibilities include leading the development of the Company's Advanced Metering Functionality Business Case filing and supporting materials in Docket No. 22-49-EL.

Q. Please describe your educational background and professional experience.

A. I hold a Bachelor of Arts degree from East Stroudsburg University of Pennsylvania and a Master of Science degree from Stevens Institute of Technology. I have more than 13 years of leadership experience at PPL Electric Utilities Corporation ("PPL Electric") across Customer Service, Advanced Metering, and Transmission & Distribution operations and project management. Prior to my current role, I was Director, Customer Service Project Management Office with direct responsibilities for PPL Electric's energy efficiency and low-income programs, along with the planning and implementation of the customer experience portfolio. From 2015-2019, I was responsible for leading the overall implementation of PPL Electric's Smart Meter Implementation Plan ("SMIP"), through which PPL Electric exchanged approximately 1.45 million automated meter reading ("AMR") meters with second-generation AMF meters in Pennsylvania. From 2009 through 2014, I held leadership roles in Attachments, Vegetation Management, Construction Management, and Project Management. I was employed with Verizon

Communications from 1996-2009 in various front line and leadership roles in Construction, Installation and Maintenance, Customer Operations, and Strategic Initiatives.

Q. Have you previously submitted testimony on behalf of Rhode Island Energy?

A. Yes, I testified on behalf of Rhode Island Energy in Docket No. 22-49-EL.

Q. What is the purpose of your joint testimony?

A. The purpose of our joint testimony is to present the Company's proposed updated Service Quality Plan for Rhode Island Public Utilities Commission ("Commission") review and approval to implement the following service quality mechanisms in accordance with the Commission's September 27, 2023, Open Meeting votes and motions in Docket No. 22-49-EL (the "Decision"): (1) Meter Reading & Billing Service Quality Adjustment ("SQA"); (2) Trouble, Non-Outage SQA; (3) Network Speed SQA; (4) Faster Outage Notification SQA; and (5) Customer Satisfaction SQA.

Q. What rulings is the Company requesting from the Commission with this filing?

A. The Company respectfully requests the Commission make the following rulings:

1. Approve the proposed updated Service Quality Plan included herein as Schedule 4;
2. Approve the Company's proposal to file a proposed Target and Thresholds for the Customer Satisfaction SQA within four months of the start of meter installation; and

3. Make any such other rulings as may be just and proper under the circumstances.

Q. Are you sponsoring any schedules with this testimony?

A. Yes, we are sponsoring:

Schedule 1: Technical Appendix

Schedule 2: Technical Appendix Data (workable Excel file)

Schedule 3: Proposed Service Quality Plan (redlined)

Schedule 4: Proposed Service Quality Plan (clean)

Q. How is this testimony organized?

A. This Section I is the Introduction. Section II presents the Company's Overall Approach to developing the proposed service quality mechanisms. Section III describes and explains the Company's proposed Meter Reading & Billing SQA. Section IV describes and explains the Company's proposed Trouble, Non-Outage SQA. Section V describes and explains the Company's proposed Network Speed SQA. Section VI describes and explains the Company's proposed Faster Outage Notification SQA. Section VII describes and explains the Company's proposed Customer Satisfaction SQA. Section VIII provides details on the Company's approach to developing proposed penalties and offsets for each of the proposed SQAs. Section IX is the Conclusion.

II. Overall Approach

Q. What was the Company's overall approach to developing the five proposed SQAs?

A. The Company's overall approach to developing the five proposed SQAs was to (1) be responsive to the Commission's order, (2) reflect the historical underpinnings of the Service Quality Plan, and (3) use data-driven and analytical methods to develop each of the five proposed SQAs. In Sections III through VIII, we describe how this approach led to our proposal for each SQA and the derivation of proposed penalties and offsets.

Q. In reference to "historical underpinnings," please summarize the specific references that have informed the development of this proposal.

A. The Company references proposals, discussion, and findings within Docket No. 3628. Specifically, these references pertain to the Service Quality Plan approved as part of the Third Amended Stipulation and Settlement between The Narragansett Electric Company, Blackstone Valley Electric Company, Newport Electric Corporation and various parties in Docket No. 2930 in the year 2000 (as referenced in Docket No. 3628), the amended Service Quality Plan proposed, discussed, and adopted in Docket No. 3628 in 2004, and the modifications made in 2007 and 2016 in Docket No. 3628.

Q. What terms does the Company use in its proposal and within this testimony that you would like to define or clarify at this time?

A. Service Quality Adjustment – An SQA is a metric used to assess a penalty (offset) for measured performance below (above) a pre-defined Target. The Service Quality Plan contains a set of SQAs.

Performance Standard – The Performance Standard is the basis by which a Target is derived, and performance is assessed relative to that Target. For example, the Performance Standard for the SAIDI and SAIFI SQAs is the Institute of Electrical and Electronics Engineers, Inc. ("IEEE") Standard 1366-2003.

Structure – The Structure of a given SQA is the character of the mapping from performance to level of penalty/offset assessed.

Target – The Target is the pre-defined value of a given SQA for which the Company is assessed zero penalty or offset for performance equal to the Target.

Dead Band – A Dead Band is a span around the Target for which $0 penalty or offset is assessed for performance within the span. For example, a Target of 100 may have a Dead Band of 100 plus or minus 10; in that case, performance between or equal to 90 through 110 would be assessed $0 penalty or offset.

Threshold – The Threshold is the value at which there is a change in how a penalty or offset is calculated. In the example in the definition of Dead Band, above, the Dead Band Threshold is 10 because the penalty (offset) changes from $0 to non-zero at performance equal to 90 (110). Similarly, the Maximum SQA Penalty/Offset Threshold is the value at which the maximum penalty (or offset) is incurred.

Maximum SQA Penalty/Offset – The Maximum SQA Penalty/Offset is the maximum penalty imposed for a single SQA.

Maximum Potential Penalty/Offset – The Maximum Potential Penalty/Offset is the sum of all maximum penalties (or offsets) for all SQAs in a Service Quality Plan.

Service Quality Plan – The Service Quality Plan is the document that describes the Target, Thresholds, Maximum SQA Penalty/Offset, measurement methodology, and calculation of penalty/offset for each SQA as well as the mechanics for reporting and assessing penalties/offsets.

Service Quality Plan "currently in effect" – The Company refers to the Service Quality Plan currently in effect as the Service Quality Plan that would remain in effect under Docket No. 3628 absent modification by this proposal.[1]

These terms are not defined in the Service Quality Plan currently in effect. Our intent in defining these terms is to aid in clarity of exposition regarding the development of this proposal and support productive discussions. These terms are used primarily to discuss the development of a proposal instead of the execution of the Service Quality Plan. The Company does not propose adding these definitions to the Service Quality Plan at this time.

Q. Did the Company consider any additional adjustments to the Service Quality Plan currently in effect beyond the updates required by the Commission's Decision?

A. No. The Company's filing addresses only modifications to the Service Quality Plan currently in effect in response to the Commission's Decision.[2]

[1] Amended Service Quality Plan for The Narragansett Electric Company ("2015 Amended Electric Service Quality Plan"). Docket No. 3628. https://ripuc.ri.gov/sites/g/files/xkgbur841/files/eventsactions/docket/3628-NGrid-Electric-SQ-SettlementAgreementpercent281-8-16percent29.pdf

[2] Open Meeting motions and votes. September 27, 2023. Docket No. 22-49-EL. https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2023-11/2249-PUC-OM-V0TES_9-27-23.pdf

Q. Did the Company engage with the Division of Public Utilities and Carriers ("Division") regarding its proposal?

A. Yes. In response to the Commission's Decision that directs "Rhode Island Energy to engage with the [Division] to negotiate the details and implementation of the following service quality mechanisms and file an updated Service Quality Plan for Commission review and approval in Docket 3628 within 3 months," the Company held two meetings with the Division during the development of its proposal.

The first meeting occurred on November 9, 2023, with three members of the Division staff present. At that time, the Company presented its preliminary concepts for Performance Standards and structure for the five SQAs contained in this proposal. The second meeting occurred on November 30, 2023, with four members of the Division staff present. At that meeting, the Company presented its proposals for Targets and Thresholds for four of the five SQAs, described its revised concept for Performance Standards and Structure for one of the five SQAs, and addressed questions for further consideration raised at the first meeting.

In addition to the two meetings referenced above, the Company shared its redlined Service Quality Plan with the Division via email on December 15, 2023, together with a summary of the Company's approach to developing proposed penalties and offsets. The Company offered an opportunity to meet to discuss any topic further and/or answer

additional questions; however, no additional meetings took place prior to filing this proposal with the Commission.

Q. Is the Company filing its proposal as an agreement or settlement with the Division?

A. No, the Company is not filing its proposal as an agreement or settlement with the Division.

III. Meter Reading and Billing SQA

Q. Please summarize the Company's approach to developing a Meter Reading and Billing SQA.

A. The Company used a data-driven approach with a statistical analysis comparable to the analysis used to derive Targets and Thresholds for existing SQAs.

Q. Please summarize the Company's key findings and resulting conclusions and explain how parties can find more detail.

A. The Company found that monthly percent meter read data is not normally distributed. A normal distribution means that data are approximately symmetrical about a center, which is not the case with the meter read data. Therefore, instead of using mean and standard deviation to describe the central tendency and variation of the data (which is only appropriate to describe data that are normally distributed), the Company used corresponding percentiles, which is more appropriate in this case to determine the Target

and Thresholds. The Technical Appendix provided as Schedule 1 describes this analysis in detail. The Technical Analysis Data provided as Schedule 2 is the workable Excel file that includes all calculations.

The Company also found that months in which a Major Event Day is declared had low percent meter reads because of the need to prioritize staff resources for power restoration over meter reading.

Q. How does the Company propose to consider months with Major Event Days?

A. The Company contends that power restoration should continue to take priority over meter reading; this prioritization is further signaled by the larger magnitude of maximum penalties for reliability-related SQAs compared to the maximum penalties for customer service-related SQAs in the Service Quality Plan currently in effect.[3] Therefore, the Company proposes to report percent meter read for months with Major Event Days but exclude those months with Major Event Days from the SQA calculation.

[3] Please see Section VIII for more discussion about the magnitude of penalties.

Q. The Commission's Decision states, "The design may or may not be linear, and it may include a dead band." Is the design of this SQA consistent with this statement?

A. Yes, the design of this SQA is consistent with this statement. The proposed SQA includes a Dead Band and linear assessment of penalty and/or offset outside of the Dead Band.

Q. Why is it appropriate to include a Dead Band for this SQA?

A. It is appropriate to include a Dead Band in cases where there is natural variability outside of the Company's direct control for which it would not be reasonable to assess a penalty or gain an offset. This natural variability exists for meter reading. Although the Company can directly control allocating its resources to increasing percentage of meters read each month, external conditions arise that are out of the control of the Company and for which the Company must prioritize its resources. A good example is prioritizing resources for power restoration following storms and other causes of interruptions.

Q. The Commission's Decision states, "The maximum penalty will be imposed for performance 2.5 standard deviations below the threshold." Does the proposed SQA meet this requirement?

A. Yes, the proposed SQA meets this requirement. Although the Threshold to impose the maximum penalty is not measured in standard deviations, the Threshold does achieve the intent that the maximum penalty is only assessed for substantially poor performance (i.e., only 0.6 percent of data falls below this Threshold).

Q. The Commission's Decision states, "The service quality mechanism should establish a threshold that represents appropriate performance (e.g. the average of the past three years)." Does the proposed SQA represent appropriate performance?

A. Yes, the proposed SQA represents appropriate performance based on the statistical nature of meter reading data and historical performance.

Q. The Commission's Decision states, "The maximum penalty should be generally consistent with existing potential penalties in Docket No. 3628 (i.e. between $200,000-$1,000,000), or show why a higher maximum penalty was determined." Is the maximum penalty consistent with existing penalties in Docket No. 3628?

A. Yes, the maximum penalty is consistent with existing penalties in Docket No. 3628. The proposed maximum penalty of $184,000 is equivalent to the maximum penalties for each of the two existing SQAs related to customer satisfaction (i.e., customer contact survey and calls answered). We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

Q. The Commission's Decision states, "The company will be subject to a meter reading & billing service quality mechanism at the end of the TSA period." When will the Meter Reading and Billing SQA go into effect under the Company's proposal?

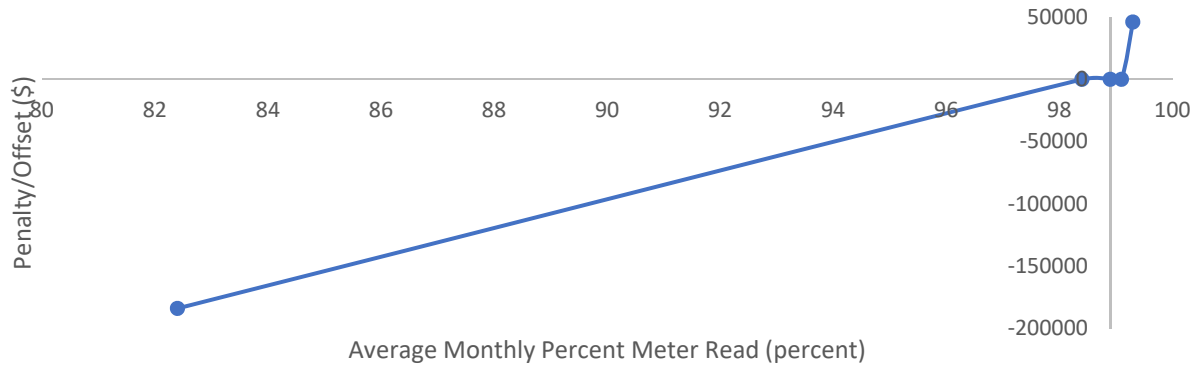
A. The Company proposes that the Meter Reading and Billing SQA go into effect the first full calendar month following the end of the Transition Services Agreement ("TSA")

period, which is the point at which National Grid USA Services Company, Inc. will no longer be providing transition services to the Company under the TSA.[4] The Company proposes the actual assessed penalty or offset to be pro-rated by the number of the months in that calendar year after the term of the TSA ends.

Q. Please summarize the proposed SQA for Meter Reading and Billing.

A. The Company illustrates the proposed Meter Reading and Billing SQA in Figure 1 below. We discuss the proposed maximum penalty and offset in more detail in Section VIII of this testimony and provide full details about the derivation and technical discussion in the Technical Appendix provided as Schedules 1 and 2 to this testimony.

Figure 1



[4] The term "National Grid" is used to refer to The Narragansett Electric Company under National Grid USA's ownership, as distinguished from the rebranded entity that is Rhode Island Energy. When referring to "National Grid USA" as the former owner of Narragansett, this testimony will use that precise term.

IV. Trouble Non-Outage SQA

Q. Please summarize the Company's approach to developing a Trouble Non-Outage SQA.

A. The Company used a data-driven approach with a statistical analysis comparable to the analysis used to derive Targets and Thresholds for existing SQAs currently in effect.

Q. Please summarize the Company's key findings and resulting conclusions and explain how parties can find more detail.

A. The Company found that the subset of data from June 2019 through August 2023 is normally distributed and best represents current trouble non-outage call volumes. The Technical Appendix provided as Schedule 1 describes this analysis in detail. The Technical Analysis Data provided as Schedule 2 is the workable Excel file that includes all calculations.

Q. The Commission's Decision states, "The SQA should impose scaled penalties for increased trouble, non-outage calls, compared to a baseline. The metric, baseline, minimum, and maximum should be defined and justified." Does the proposed SQA impose scaled penalties for increased trouble non-outage calls compared to a baseline?

A. Yes, the proposed SQA imposes scaled penalties for increased trouble non-outage calls compared to a baseline.

Q. How does the Company justify the "metric, baseline, minimum, and maximum"?

A. The specific structure of the proposed SQA is based on the statistical nature of trouble non-outage call volume data and historical performance. Specifically, the proposed SQA uses a baseline of trouble non-outage call volume based on actual average trouble non-outage call volume from June 2019 through August 2023. Outside of the proposed Dead Band, the Company will incur increasingly large penalties for increasing trouble non-outage calls.

Q. Why is it appropriate to include a Dead Band for this SQA?

A. It is appropriate to include a Dead Band in cases where there is natural variability outside of the Company's direct control for which it would not be reasonable to assess a penalty or gain an offset. This natural variability exists for trouble non-outage calls. For example, trouble non-outage call volumes are not correlated with outage call volumes (r-squared = 0.09) or with total call volumes (r-squared = 0.01).[5] Therefore, it is appropriate to include a Dead Band in the SQA.

[5] R-squared is a statistical measure of the strength of correlation. An r-squared value of 0 indicates zero correlation. An r-squared value of 1 indicates perfect correlation.

Q. The Commission's Decision states, "The maximum penalty should be generally consistent with existing potential penalties in Docket No. 3628 (i.e. between $200,000-$1,000,000), or show why a higher maximum was chosen." Is the maximum penalty consistent with existing penalties in Docket No. 3628?

A. Yes, the maximum penalty is consistent with existing penalties in Docket No. 3628. We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

Q. The Commission's Decision states, "Within twelve months after meter installation starts, the company will be subject to a service quality mechanism for trouble, non-outage calls." When is "twelve months after meter installation starts" and how will it be determined?

A. The start of meter installation is the day on which the first advanced meter is installed. "Twelve months after meter installation starts" is that same day the following year. The Company proposes to begin this SQA the calendar month of the day that occurs "twelve months after meter installation starts."

Q. If "twelve months after meter installation starts" is mid-year, when will the Trouble Non-Outage SQA go into effect?

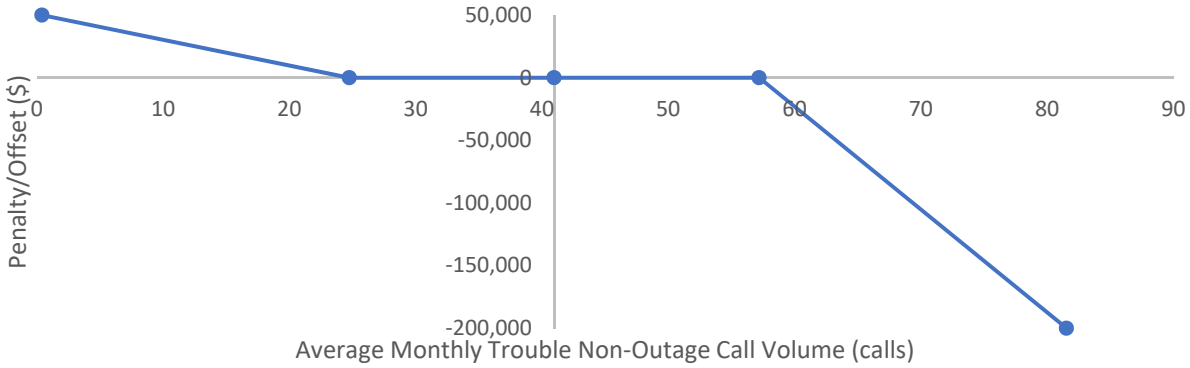
A. The Company proposes the Trouble Non-Outage SQA to go into effect the calendar month of the day that occurs "twelve months after meter installation starts," with the actual assessed penalty or offset to be pro-rated by the number of months in that calendar

year after the term of the TSA ends. For example, if meter installation starts on November 15, 2024, the Company will be assessed 16.7 percent (two months out of 12) of the actual penalty of offset incurred in calendar year 2025 based on trouble non-outage call volume for November through December 2025.

Q. Please summarize the proposed SQA for Trouble Non-Outage.

A. The Company illustrates the proposed SQA for Trouble Non-Outage in Figure 2 below. We discuss the proposed maximum penalty and offset in more detail in Section VIII of this testimony and provide full details about the derivation and technical discussion in the Technical Appendix provided as Schedules 1 and 2 to this testimony.

Figure 2



V. Network Speed SQA

Q. Please summarize the Company's approach to developing a Network Speed SQA.

A. The Company used a data-driven and technologically-sound approach to developing a Network Speed SQA, specifically related to the development of the measurement methodology and the derivation of the Target.

Q. Please summarize the Company's key findings and resulting conclusions, and explain how parties can find more detail.

A. The Company highlights two key findings.

First, the process of retrieving missing packets of data following the initial transmission (referred to as "gap reconciliation") is expected to rectify roughly half of the missing data packets. Given an initial transmission success rate of 80 percent (meaning 80 percent of packets successfully traveled from the meter to the head-end system), eight gap reconciliations are needed to obtain 99.9 percent of data. Because only half of the missing data is ever rectified with any given gap reconciliation, it is unreasonable to expect 100 percent of data will be available prior to the update of billing quality data on the customer portal, which will occur within 24 hours. Stated differently, only 98.8 percent of data will be available within 24 hours (i.e., equivalent to 95 out of 96 15-minute intervals of data each day).

Second, the Company determined that the variables that affect the ability of data to travel successfully from a customer's meter to the Customer Portal are typically customer specific. These customer-specific variables, discussed in more detail below, include topography, new construction, localized external communications issues and updates, construction, and natural disasters.

These two findings lead to the conclusion that an SQA designed to capture the Target proportion of customers meeting a Target network speed is the most appropriate way to assess network speed performance based on the actual technological processes and interactions underlying network speed.

Q. The Commission's Decision states, "The service quality mechanism should establish a measurement of network speed. The measurement should capture the speed of information from the meter to the meter data management system ("MDMS") and back to the customer portal or explain why a different measurement was chosen." What measurement is the Company proposing?

A. The Company is proposing to measure network speed based on the duration of time required (minutes) for information to get from the meter to the customer portal.[6]

[6] Note that "speed" is typically defined as distance covered per unit of time (e.g., miles per hour). This technically narrow definition of "speed" is inappropriate for this SQA, so the Company is using a more colloquial connotation of "speed."

Q. The Commission Decision states, "The service quality mechanism should establish the time period and scope of the measurement." What time period and scope of measurement is the Company proposing?

A. The Company is proposing to collect data used to measure network speed over the 30-day span ("test period") following "full project implementation" as determined by the completion of the "final project acceptance" milestone document by PPL, Rhode Island Energy, and its advanced metering functionality vendors. The SQA will be assessed within the annual report for the calendar year that contains the last day of the 30-day test period.

Q. The Commission's Decision states, "The company and parties should propose the maximum penalty and threshold. Intervals, bins, and dead bands may be considered." Does the Company's proposal align with this statement?

A. Yes, the design of this SQA is consistent with this statement. The proposed SQA includes a Dead Band around a Target, a linearly increasing penalty for poorer performance relative to the Target and culminating in a maximum penalty at a pre-defined Threshold, and a linearly increasing offset for better performance relative to the Target and culminating in a maximum offset at a pre-defined Threshold.

Q. Why is it appropriate to include a Dead Band for this SQA?

A. It is appropriate to include a Dead Band in cases where there is natural variability outside of the Company's direct control for which it would not be reasonable to assess a penalty or gain an offset. This natural variability exists for Network Speed for the reasons as discussed earlier in this testimony. Therefore, it is appropriate to include a Dead Band in the SQA.

Q. Did the Company consider an overall average across all customers for this SQA?

A. Yes, the Company considered an overall average across all customers for this SQA. An overall average (i.e., mean) is an appropriate way to describe the central tendency of data that is normally distributed (and standard deviation is an appropriate way to describe the spread, or variation, of data that is normally distributed), where data that are "normally distributed" have a central cluster and are spread symmetrically on either side of the center.

Q. Why is an overall average across all customers less appropriate than the design proposed for this SQA?

A. Network speed data are not expected to be normally distributed. Network speed data are more likely to be distributed asymmetrically with a cluster of data around 30 minutes (representing the roughly 80 percent of packets successfully transmitted in the initial transmission) and a long righthand tail that captures the relatively few data packets that

require a substantially longer duration to travel from the customer meter to the customer portal (e.g., the data packets that are rectified in the fifth gap reconciliation). The shape of the expected distribution leads to the conclusion that using the statistics of mean and standard deviation would be an inappropriate way to characterize network speed data. Therefore, the Company does not propose a Network Speed SQA that uses mean and standard deviation to derive the Target and Thresholds.

Although taking a total average across all network speeds for all data packets for *all* customers may not be appropriate, the Company considers using the average network speed for all data packets for *each* customer to be reasonable. This is because the factors that impact network speed are likely to be customer specific; only a subset of customers may experience a distribution of network speed data with the long right-hand tail for which an average would not be appropriate. By designing the Network Speed SQA as a Target percentage of customers for whom their average network speeds are faster than a Target speed, the design effectively focuses on only customers for which an average is an appropriate statistic to describe their network speed data. Therefore, the proposed design of the Network Speed SQA is reasonable for the statistical nature of the data.

Q. The Commission's Decision states, "The company will be subject to a one-time or continuous network speed service quality mechanism 12 months after full project implementation." Is the Company proposing that the Network Speed SQA be assessed one-time or be assessed on a recurring basis?

A. The Company is proposing that the Network Speed SQA be assessed one-time.

Q. Why is a one-time assessment more appropriate than a recurring assessment?

A. A one-time assessment would be appropriate for service quality aspects that are not likely to change over time; a recurring assessment would be appropriate for service quality aspects that are likely to or susceptible to change over time. Network Speed is unlikely to change over time. The factors that drive Network Speed, once established, and the likelihood of these factors changing over time are:

- Topography – Topography, like hills and cliffs, can block signals from the meter to the MDMS. Topography is unlikely to change over time.
- Construction – Construction of new buildings, particularly large and tall buildings, can block signals from the meter to the MDMS. Although there is some likelihood that construction occurs, the Company mitigates against construction-related network speed delays as a normal course of business. Specifically, the Company engages in an analysis of customer meter network speed for all customers within a three-block minimum radius from a newly constructed building prompted at the creation of a new

customer account request associated with the new construction. Given the limited likelihood of construction's impacts (*i.e.*, low-medium probability combined with mitigation in normal course of business), the Company does not consider construction as warranting a recurring assessment of network speed.

- External communications issues and updates out of the control of the Company – Although there is a high likelihood of some delays to network speed caused by factors solely pertaining to the larger communication infrastructure system, these factors are unlikely to change over time. Furthermore, the Company proposes to remove data that have been delayed as a result of the communications company, which is outside of the Company's control, from its data used to assess performance. In doing so, even a change to the frequency of external communications issues would not affect the Network Speed SQA if assessed on a recurring basis.
- Degradation of equipment – There is a probability that equipment used to transmit data from the meter to the customer portal degrades over time, which would result in a slowing of network speed. The impact of this degradation, however, is expected to be negligible.
- Noise related to software issues and updates – As with any software, there may be issues or updates that are either planned or unexpected. For unexpected issues, the Company mitigates against the risk of issues occurring, mitigates against the impact of an issue if one were to occur, and considers such issues and updates together as

adding noise to the data rather than presenting a material change to average network speed experienced across the customer base.

- Natural disasters – Extreme and unplanned events like natural disasters may impact network speed performance during the event and restoration. Because of the localized impacts of natural disasters, the Company would anticipate a natural disaster as having a more localized effect on the average network speed of a subset of customers, rather than across the entire customer base. Furthermore, the Company proposes to remove data for which the meter was without power during the intervals in question. Therefore, there is low likelihood of impact and even a change to frequency of external communications issue would not affect the Network Speed SQA if assessed on a recurring basis.

Given the low likelihood of change to the proportion of customers experiencing average network speed faster than or equal to 45 minutes, and the practical consideration that assessing Network Speed is administratively cumbersome, the Company posits it is most appropriate to assess a Network Speed SQA on a one-time basis.

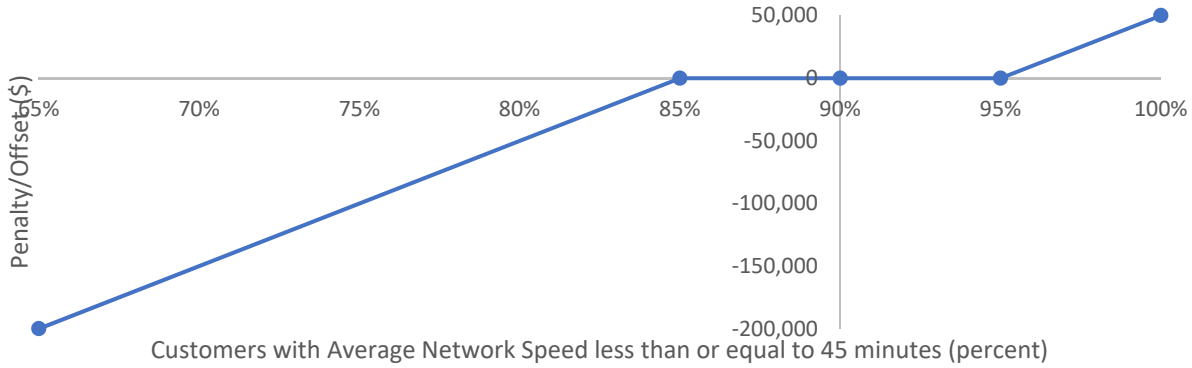
Q. The Commission's Decision states, "The maximum penalty should be generally consistent with existing potential penalties in Docket 3628 (*i.e.* between $200,000-$1,000,000), or show why a higher maximum was chosen." Is the maximum penalty consistent with existing penalties in Docket No. 3628?

A. Yes, the proposed maximum penalty is consistent with the existing penalties in Docket No. 3628. We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

Q. Please summarize the proposed SQA for Network Speed.

A. The Company illustrates the proposed Network Speed SQA in Figure 3 below. We discuss the proposed maximum penalty and offset in more detail in Section VIII of this testimony and provide full details about the derivation and technical discussion in the Technical Appendix provided as Schedules 1 and 2 to this testimony.

Figure 3



VI. Faster Outage Notification SQA

Q. Please summarize the Company's approach to developing a Faster Outage Notification SQA.

A. The Company used an approach based on, and consistent with, the Company's analysis used to claim a faster outage notification benefit within Docket No. 22-49-EL.

Q. Please summarize the Company's analysis used to derive the estimated faster outage notification.

A. The Company used the difference in time between the first Last Gasp meter outage notification and the first customer-initiated notification (e.g., customer call to the call center) as a proxy for how much faster the Company becomes aware of a customer outage with advanced meters compared to without advanced meters. The Company proposes to use this same time differential using Rhode Island data to assess Faster Outage Notification performance. The Company proposes a Target of 22 minutes faster outage notification consistent with the Company's presentation in Docket No. 22-49-EL, and consistent with the Commission's Decision.

Q. The Commission's Decision states, "The service quality mechanism should establish a baseline for outage notification." What is the proposed baseline?

A. The Company does not propose a baseline, *per se*, in that the Company does not propose to estimate an average duration between outage and customer-initiated notification prior

to installation of advanced meters. Doing so would be impossible with the existing fleet of meters because the existing fleet of meters cannot provide Last Gasp notification. Instead, the Company is proposing to use the same methodology used in the analysis to derive the magnitude of the Faster Outage Notification benefit as presented in Docket No. 22-49-EL. This analysis uses only data from advanced meters; this analysis does not use any data from before advanced meters are installed.

Q. The Commission's Decision states, "The metric may be an annual average over all customers or explain why a different metric was chosen." Is the proposed SQA based on an annual average over all customers?

A. No, the Company proposes an SQA that assesses performance using an average of the difference in Last Gasp outage notification and the first customer-initiated outage notification for each outage, across all outages in a 12-month period. This method is consistent with the method used to derive the 22-minute faster outage notification benefit discussed in Docket No. 22-49-EL. To be clear, the Company does not propose to take an average across all customers. For a given outage, averaging across all customers would have the effect of substantially increasing the difference in time between the Last Gasp outage notification and the customer-initiated notifications. (For example: If the Last Gasp outage notification occurs at noon and the first customer-initiated notification occurs at 12:22, then this singular example results in a Faster Outage Notification = 22 minutes. If the Company were to average across all customers, then every subsequent

customer-initiated outage notification subsequent to the first customer-initiated outage notification would be later in time, with roughly 20 percent of customers not expected to call in at all. Averaging across all customers would necessarily result in Faster Outage Notification > 22 minutes.)

Q. The Commission's Decision states, "The mechanism may or may not be linear. Intervals, bins, and dead-bands may be considered." Is the design of this SQA consistent with this direction?

A. Yes, the proposed design of this SQA is consistent with this direction. The proposed SQA includes a Dead Band and linear assessment of penalty/offset outside of the Dead Band.

Q. Why is it appropriate to include a Dead Band for this SQA?

A. It is appropriate to include a Dead Band in cases where there is natural variability outside of the Company's direct control for which it would not be reasonable to assess a penalty or gain an offset. This natural variability exists for customer-initiated outage notification calls. First, in its analysis within Docket No. 22-49-EL, the Company assumed that behavior of Rhode Island customers is likely to be similar to behavior of Pennsylvania customers, and, therefore, outage notification findings would be externally valid and could be applied to Rhode Island. However, as noted during proceedings in that docket, there may be variations in customer behavior that impact the applicability of this assumption. In other words, Rhode Island customers may call regarding an outage either

faster or slower than Pennsylvania customers. Second, data from Pennsylvania used in the analysis in Docket No. 22-49-EL showed that roughly 20 percent of customers who experience an outage never call in. However, the reason why this subset of customers does not call to notify the Company of an outage is not observed, and, therefore, the Company cannot determine the speed at which those customers would notify the Company if they chose to do so. The combination of these two factors leads the Company to the conclusion that there is likely some natural variability in customer-initiated outage notifications; therefore, it is appropriate to include a Dead Band in the SQA.

Q. How did the Company develop the Dead Band?

A. Because the natural variability referenced in the previous response is not observable in the data *a priori* (*i.e.*, the data do not provide insight regarding external validity or regarding the subset of customers who never call), the Company could not use a statistically derived measure of variability to determine the Thresholds for the Dead Band. Instead, the Company proposes to manufacture a lower Threshold based on the scenario that all 20 percent of customers who never call in would call in at the same time as the Last Gasp outage notification (i.e., 0 minutes faster). The calculation is a weighted average, where 0.8 corresponds to the 80 percent of customers who do call regarding an outage, with an average call time of 22 minutes, and 0.2 corresponds to the 20 percent of customers who never call, with an assumed call time of zero minutes:

$$Lower\ Dead\ Band\ Threshold\ = 0.8 * 22\ minutes + 0.2 * 0\ minutes$$

$$= 17.6\ minutes$$

Using this reasoning, the Company proposes a lower Threshold for the Dead Band of 17.6 minutes. The Company then applies the same differential between the Target and lower bound of the Dead Band (i.e., 4.4 minutes) to derive a symmetrical upper bound of the Dead Band (i.e., 26.4 minutes). The Company applied the Threshold for maximum penalty/offset used in other SQAs (2.5 standard deviations) to derive the Threshold for maximum offset (i.e., 33 minutes faster) for the Faster Outage Notification SQA. The Commission's Decision predetermined the Threshold at which the maximum penalty is assessed (zero minutes).

Q. The Commission's Decision states, "The maximum penalty will be imposed if evidence shows that the company is notified of outages 0 minutes faster than the baseline." Is the proposed SQA aligned with this statement?

A. Yes, the proposed SQA imposes the maximum penalty if data shows that the outage notification provided by the Last Gasp notification from advanced meters is no faster than customer-initiated calls (i.e., Faster Outage Notification = zero minutes).

Q. The Commission's Decision states, "No penalty will be imposed if evidence shows that the company is notified of outages 22 minutes faster than the baseline." Is the proposed SQA aligned with this statement?

A. Yes, the proposed SQA imposes zero penalty if data shows that the outage notification provided by the Last Gasp notification from advanced meters is 22 minutes faster than customer-initiated calls (i.e., Faster Outage Notification = 22 minutes).

Q. The Commission's Decision states, "The maximum penalty should be generally consistent with existing potential penalties in Docket 3628 (i.e. between $200,000-$1,000,000), or show why a higher maximum was chosen." Is the maximum penalty consistent with existing penalties in Docket No. 3628?

A. Yes, the proposed maximum penalty is consistent with the existing penalties in Docket No. 3628. We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

Q. The Commission's Decision states, "The mechanism may (but is not required to) include a shared savings mechanism for evidence that that the company is notified of outages more than 23 minutes faster than the baseline." Is the design of this SQA consistent with this statement?

A. Yes, the proposed design of this SQA is consistent with this statement; however, the Company proposes to earn an offset in the same manner as the other SQAs rather than

base non-offset, monetary earnings on shared savings. We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

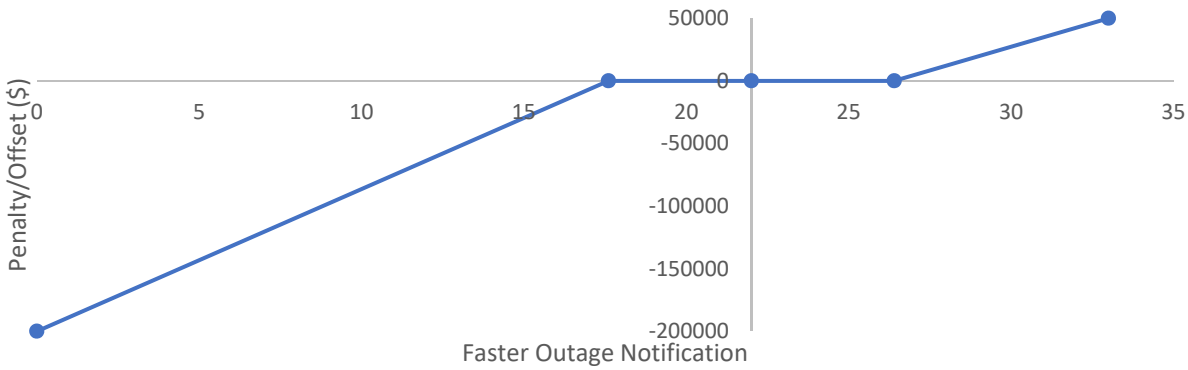
Q. The Commission's Decision states, "The company will be subject to a one-time faster outage notification service quality mechanism 12 months after full project implementation." Is the proposed SQA aligned with this statement?

A. Yes, the proposed SQA is a one-time assessment 12 months after full project implementation. The Company proposes to collect data to assess Faster Outage Notification performance in the 12-month span ("test period") commencing following full project implementation. Full project implementation is determined by the execution of the "final project acceptance" milestone among PPL, Rhode Island Energy, and its advanced metering functionality vendor. The SQA will be assessed within the annual report for the calendar year that contains the last day of the 12-month test period.

Q. Please summarize the proposed Faster Outage Notification SQA.

A. The Company illustrates the proposed SQA for Faster Outage Notification in Figure 4 below. We discuss the proposed maximum penalty and offset in more detail in Section VIII of this testimony and provide full details about the derivation and technical discussion in the Technical Appendix provided as Schedules 1 and 2 to this testimony.

Figure 4



VII. Customer Satisfaction SQA

Q. Please summarize the Company's approach to developing a Customer Satisfaction SQA.

A. The Company used an approach that preserved the existing customer contact SQA currently in effect and supplemented with data specifically related to the primary driver of customer satisfaction and data collected from a less biased sample of customers for a more representative assessment of overall customer satisfaction.

Q. Please summarize the Company's key findings and resulting conclusions, and explain how parties can find more detail.

A. The Company identified three key insights into the existing customer satisfaction SQA that is based on the customer contact survey.

First, only one of the two questions of interest in the customer contact survey is likely to provide any insight into how customer satisfaction changes with the deployment of advanced meters. The question that may provide insight is "Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied," how satisfied are you with the services provided by Rhode Island Energy?" This question may provide insight because it asks about satisfaction generally. The question that is unlikely to provide insight is "Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied," how satisfied are you with the quality of the service provided by the telephone representative?" This question is unlikely to provide insight because advanced metering does not fundamentally change the service provided by the telephone representative.

Second, the existing customer satisfaction SQA that is based on the customer contact survey data collected from a biased sample of customers. This survey is only administered to "customers who have contacted the call center recently" (Service Quality Plan currently in effect). It is plausible that this subset of customers is more likely to be dissatisfied with Rhode Island Energy because they are selected based on contacting the customer call center, and most customers only contact the customer call center if they experience a problem or have a need. Therefore, it is plausible that survey responses will be biased toward dissatisfaction. The deployment of advanced meters will not fundamentally alter the sample of customer surveyed, so there is limited likelihood that

responses to either of the two customer contact survey questions will be affected by the deployment of advanced meters.

Third, although the customer contact survey is not ideal for assessing any increase to customer satisfaction, the customer contact survey is able to provide valuable feedback regarding the satisfaction of the subset of customers surveyed.

Together, these three insights led the Company to conclude that it would be appropriate to maintain the two customer contact survey questions, supplement these two customer contact survey questions with another question that can reveal changes pre- and post-deployment, and supplement the three customer contact survey questions with survey responses from a truly random and unbiased sample of customers.

Q. What question does the Company propose to add to the customer contact survey?

A. The Company proposes to add a question to the customer contact survey that is likely to elicit a change in response from before advanced meter deployment to after advanced meter deployment. From experience in Pennsylvania and from industry research, the Company recognizes that a primary driver of customer satisfaction is power reliability.[7] Advanced metering is also likely to improve power reliability, such as through faster

[7] The J.D. Power Electric Utility Residential Customer Satisfaction Study Index Model is comprised of six Index Factors, with Reliability having the most significant impact at 25 percent of overall customer satisfaction with a utility. (Source 2023 J.D. Power Electric Utility Residential Study Methodology)

outage notification. Therefore, a supplemental question about reliability is reasonably likely to provide insights into changes in customer satisfaction. The Company proposes to add "Using a 10-point scale, where 1 means unacceptable and 10 means outstanding, how would you rate the reliability of electric service delivered to your home (or business)?" to the customer contact survey.

Q. What survey responses from a truly random and unbiased sample of customers does the Company propose to add to this SQA?

A. The Company is implementing what it refers to as the "Quarterly Customer Satisfaction Survey" beginning in the first quarter of 2024. This ten-minute survey is conducted by a third-party vendor for a random sample of 2000 residential customers (surveyed online) and 400 small and mid-sized commercial customers (surveyed over the phone) in aggregate across a calendar year. The larger objective of the survey is to measure and track overall satisfaction and other key components that impact Company performance. Respondents are decision makers for the electric or gas service or pay the utility bill for the household or business. Data is weighted to ensure an accurate representation of customers in the customer base. Because this survey is conducted with a random sample of customers, those customers are equally likely to have recently had a complaint, called the call center, had a recent strong interaction with the Company, or any other potential cause of self-reported satisfaction levels. Furthermore, the Company will be able to connect customer responses to other aspects of service, like having an advanced meter or

not, which will allow for further statistically robust analysis to disentangle the effects and mechanisms for impact of advanced meters. The Company proposes incorporating the results to the same reliability question proposed to supplement the customer contact survey into the assessment of customer satisfaction in the SQA.

Q. What is the value of including results to the same question from two different samples of the customer base?

A. The primary benefit of including results to the same question from two different samples of the customer base is that the Company will be able to understand and characterize the bias of the customer contact survey sample relative to a random ostensibly unbiased sample, thereby producing a more accurate measure of customer satisfaction pre- and post-advanced meter deployment.

Q. How does the Company propose to aggregate responses to these four questions (three questions from the customer contact survey and one question from the quarterly customer satisfaction survey)?

A. The Company proposes to apply the same method currently used to determine the individual satisfaction score for each question and the composite score used to assess performance relative to a Target. The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8," "9," or "10" on a ten-point scale where one means "dissatisfied" or "unacceptable" and ten means "satisfied" or

"outstanding." The percent satisfied composite score is a simple arithmetic average of the satisfaction score from each question.

Q. The Commission's Decision states, "Updates may include, but not be limited to, increasing the minimum percent satisfied threshold, increasing the value of the penalty, and narrowing the dead band." Is the design of this SQA consistent with this statement?

A. Yes, the proposed design of this SQA is consistent with this statement. The proposed SQA includes a Dead Band and linear assessment of penalty/offset outside of the Dead Band.

Q. What does the Company propose for the design and the derivation of the Target and Thresholds of the SQA?

A. The Company proposes to maintain a design similar to the customer contact SQA currently in effect: an identified Target based on actual historical data, a Dead Band with Thresholds determined by one standard deviation from the Target, and maximum penalty/offset assessed at 2.5 standard deviations from the Target. Because the Company is proposing to add two questions (one question to the customer contact survey and one question from the forthcoming quarterly customer satisfaction survey), there is no data from which to derive a Target and Thresholds at present. The Company proposes to collect data beginning in 2024 from which it will calculate the mean of the individual

satisfaction score to each question. The Company will compute a percent satisfied composite using the existing Target for the existing two customer contact survey questions and the individual satisfaction score means from the two new questions using the baseline data collected beginning in 2024. The Company proposes to file a compliance filing with the Commission within four months of the start of meter installation. The compliance filing will include a redlined Service Quality Plan updated to reflect the proposed updated mean and standard deviation for the Customer Satisfaction SQA.

Q. Why is it appropriate to include a Dead Band for this SQA?

A. It is appropriate to include a Dead Band in cases where there is natural variability outside of the Company's direct control for which it would not be reasonable to assess a penalty or gain an offset. This natural variability exists for Customer Satisfaction, as recognized in the design of the existing SQA. The Company does not propose to change this design; the Company continues to include a Dead Band in its proposed SQA for Customer Satisfaction.

Q. The Commission's Decision states, "The maximum penalty should be generally consistent with existing potential penalties in Docket 3628 (*i.e.* between $200,000-$1,000,000), or show why a higher maximum was chosen." Is the maximum penalty consistent with existing penalties in Docket No. 3628?

A. Yes, the proposed maximum penalty is consistent with the existing penalties in Docket No. 3628. We discuss the proposed penalties and offsets in more detail in Section VIII of this testimony.

Q. The Commission's Decision states, "Within six months after meter installation starts, the company will be subject to an updated customer contact standard that reflects the company's expectations of higher customer satisfaction." Is the proposed SQA in alignment with this direction?

A. Alignment with this statement requires assessment of whether the Target and design of the SQA "reflects the company's expectations of higher customer satisfaction." Although the Company has proposed an update to this SQA intended to reflect expectations of higher customer satisfaction due to improved reliability, and the Company intends to file a proposed SQA that reflects the Company's expectations of higher customer satisfaction, the Company does not have sufficient information to make a conclusive assessment of whether the proposed SQA reflects the Company's expectations of higher customer satisfaction at present.

Q. Please summarize the proposed Customer Satisfaction SQA.

A. The Company proposes an SQA in which zero penalty is assessed/zero offset is earned for customer satisfaction within one standard deviation of a Target, and the maximum penalty (offset) is assessed for customer satisfaction 2.5 standard deviations below (above) the Target. The Customer Satisfaction SQA will build on the existing SQA by adding a question to the existing customer contact survey directed toward assessing customer satisfaction associated with service reliability, and by adding results from that same question from a separate randomized customer survey. The specific Target and Thresholds will be developed from data collected in 2024, subject to Commission review and approval through a compliance filing. We discuss the proposed maximum penalty and offset in more detail in Section VIII of this testimony and provide full details about the derivation and technical discussion in the Technical Appendix provided as Schedules 1 and 2 to this testimony.

VIII. Determination of Penalties and Offsets

Q. Please summarize the Company's approach to determining penalties and offsets.

A. The Company's approach to determining an appropriate magnitude for each SQA's maximum penalty/offset was to retain the same reasoning used in prior Service Quality Plans. Using this reasoning, the Company first determined an appropriate total maximum penalty in aggregate for the entire service quality plan (referred to henceforth as the "plan maximum penalty"). Then, the Company used prior reasoning to determine the aggregate

maximum penalty for reliability-related SQAs and each individual maximum penalty, and the aggregate maximum penalty for customer satisfaction-related SQAs and each individual maximum penalty. Then, the Company used prior reasoning to determine the proposed maximum offset for each SQA.

Q. Please elaborate on "prior reasoning" and explain how it was used to develop a proposal for the plan maximum penalty.

A. In reviewing materials on record in Docket No. 3628, the Company found that the service quality plan in effect in 2000 (resulting from Docket No. 2930) had set the plan maximum penalty at $2.4 million. When the service quality plan was amended in 2004, parties[8] lowered the plan maximum penalty to $2.2 million, roughly one percent of electric distribution revenues; the Commission affirmed this amount in Docket No. 3628, finding, "[a] maximum annual penalty of $2.2 million should be a sufficient deterrent to Narragansett against declining service quality" (Commission Findings, Order No. 18294, Docket No. 3628 at 11). Neither amendment to the Service Quality Plan in 2007 and 2016 (both within Docket No. 3628) attempted to change the plan maximum penalty.

[8] The Company and the Division were the sole parties to a Distribution Rate Plan Settlement Agreement in Docket No. 3617, which was accepted by the Commission in Order No. 18294, Docket No. 3628.

The Company then (i) reviewed its record of penalty assessment and found it has been penalized five times since 2005, with no penalties since 2016,[9] (ii) concluded and re-confirmed its internal concurrence that this level of plan maximum penalty (i.e., one percent of electric distribution revenues) is a sufficient deterrent against declining service quality, and (iii) determined that, following the 2010 Revenue Decoupling Act, the electric revenue decoupling mechanism ("RDM") is the appropriate equivalent to "electric distribution revenue" pre-Revenue Decoupling Act. The Company's 2022 RDM was $299 million, so one percent of the RDM equates to a plan maximum penalty of $2.9 million.

Q. What did the Company do next?

A. Next, the Company looked again to prior reasoning on the record in Docket No. 3628 for how to divide the plan maximum penalty among all constituent SQAs. The Commission found that an 83 percent/17 percent split between reliability SQAs and customer satisfaction SQAs, respectively, was appropriate:

> The current and the proposed SQPs both weigh 83 percent of the penalty to the reliability service measures and the remaining 17 percent to the customer service measures. This approach is appropriate because reliability is of the utmost concern to all ratepayers. Without reliable electric service, a modern society, economically and socially, would decline. Thus, placing 83 percent of a potential penalty upon reliability service measures demonstrates the importance of reliability to the Commission. (Order No. 18294, Docket No. 3628, Commission Findings at 11.)

[9] See Annual Reports: 2005-2022 Annual Reports available on https://ripuc.ri.gov/eventsactions/docket/3628page.html.

Using this 83 percent/17 percent benchmark, the Company estimated the new set of reliability-related SQAs should have a maximum penalty of approximately $2.4 million in aggregate and the new set of customer satisfaction-related SQAs should have a maximum penalty of approximately $500,000 in aggregate.

Q. How did the Company then arrive at the proposed maximum penalty for each SQA?

A. Because the Commission's ruling in Docket No. 22-49-EL pertains only to new or updated SQAs, the Company did not find it appropriate to propose any modifications – including modifications to maximum penalties – for the existing SQAs that were not part of the Commission's order (i.e., SAIDI, SAIFI, and Calls Answered). Maintaining those maximum penalties, and using the 83 percent/17 percent split, there is approximately $600,000 to be divided among the new reliability-related SQAs (i.e., Trouble Non-Outage, Faster Outage Notification, and Network Speed). The Company is proposing to allocate a $200,000 maximum penalty to each of these three new reliability-related SQAs, for a total of $600,000 in new potential penalties for SQAs related to reliability.

Similarly, the Company took the existing maximum penalties for the Calls Answered SQA as a given (i.e., $184,000), leaving approximately $368,000 to be divided among the updated and new customer satisfaction-related SQAs (i.e., updated Customer Contact Survey and Meter Reading & Billing). The Company is proposing to allocate $184,000 to each of these two SQAs, thereby maintaining the maximum penalty for the Customer

Contact Survey and setting the maximum penalty for Meter Reading & Billing equal to each of the other customer satisfaction SQAs.

Q. To what extent do the resulting proposed maximum penalties for each SQA align with prior reasoning?

A. The resulting proposed maximum penalties for each SQA align well with prior reasoning. The plan maximum penalty proposed is $2.984 million, which is approximately one percent of electric RDM. The aggregate maximum penalties for reliability-related SQAs and customer service-related SQAs is split 81.5 percent for reliability and 18.5 percent for customer satisfaction, proximate to the prior 83 percent/17 percent split.

Q. The Company is proposing that the Faster Outage Notification and Network Speed SQAs to be one-time adjustments. Will the plan maximum penalty still be sufficient to deter against declining service quality in subsequent years?

A. Yes, based on historical performance, the Company is confident the plan maximum penalty will be sufficient to deter against declining service quality in subsequent years.

The Faster Outage Notification SQA serves to reduce duration of interruptions, which is covered on an annual and ongoing basis through the SAIDI SQA. The SAIDI SQA has been shown to be effective (evidenced by the Company incurring only two penalties for SAIDI in 2005 and 2010, neither of which reached the maximum penalty).

The Company contends it already has an ongoing accountability mechanism for Network Speed. The Commission's Decision includes the requirement that "the effect of the CapEx cap is that the Company will be required to keep spending, even if above the cap, until it achieves the functionalities as set forth in prior motions today."[10] The Commission's Decision at paragraph (3)(b) specifically references the functionalities listed in Figures 6.2 and 6.3 in the Company's Advanced Metering Functionality Business Case. Figure 6.3 includes the functionality of near real-time customer data access: "Availability of near real-time raw usage data through the customer portal. This allows 15-minute electrical raw usage data, available within 30-45 minutes, updated with the bill quality data within 24 hours."[11] Therefore, the Company has an accountability mechanism in place to ensure that Target Network Speed is achieved.

After the Faster Outage Notification and Network Speed SQAs are assessed, the Company will continue to incur three reliability-related SQAs: SAIFI, SAIDI, and Trouble Non-Outage. The existing SQAs for SAIFI and SAIDI (i) are out of scope for the Company's proposal and (ii) have already proven to be effective as demonstrated by the track record of penalties assessed and performance. Therefore, the Company contends

[10] See Motion 11: https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2023-11/2249-PUC-OM-V0TES_9-27-23.pdf

[11] See Bates Page 72: https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2022-11/2249-RIE-AMFPlan-Book2percent2011-18-22.pdf

that there is no change that is warranted at this time for the SAIFI or SAIDI SQAs. The Company contends it also already has an ongoing accountability mechanism for Trouble Non-Outage. Trouble Non-Outage calls are typically driven by issues with voltage.[12] Figure 6.3 references functionalities related to voltage measurement (i.e., ADMS Voltage Automated Notification: Configurable real-time alert for momentary under or over voltage on a meter integrated into ADMS for immediate action, and ADMS On Demand Voltage Measurement: ADMS function to ping networked electric devices and meters for voltage measurements).[13] Therefore, the Company has an accountability mechanism in place (i.e., Commission Decision paragraph (3)(b)) to ensure that Target Trouble Non-Outage is achieved.

Therefore, the proposed plan maximum penalty, proposed individual maximum penalties, and proposed assessment frequency and structure for each reliability-related SQA will be sufficient to deter against declining service quality in subsequent years.

[12] Trouble Non-Outage calls include calls related to "dim lights, low voltage, half-power, flickering lights, reduced TV picture size, high voltage, frequently burned out bulbs, motor running problems, damaged appliances and equipment, computer operation problems and non-Interruptions related inquiries."

[13] See Bates Page 72: https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2022-11/2249-RIE-AMFPlan-Book2percent2011-18-22.pdf

Q. How did the Company determine its proposed maximum offsets?

A. The Company is not proposing any changes to prior reasoning behind the magnitude of maximum offsets, which were adjusted from 75 percent to 25 percent of maximum penalties in the Settlement Agreement between the The Narragansett Electric Company and the Division filed with the Commission on December 29, 2004, as approved by the Commission in Report and Order No. 19294 in Docket No. 3628. The Company proposes a maximum offset that is 25 percent of the maximum penalty for each SQA.

IX. Conclusion

Q. Does this conclude your testimony?

A. Yes, it does.

Schedule 1

Technical Appendix

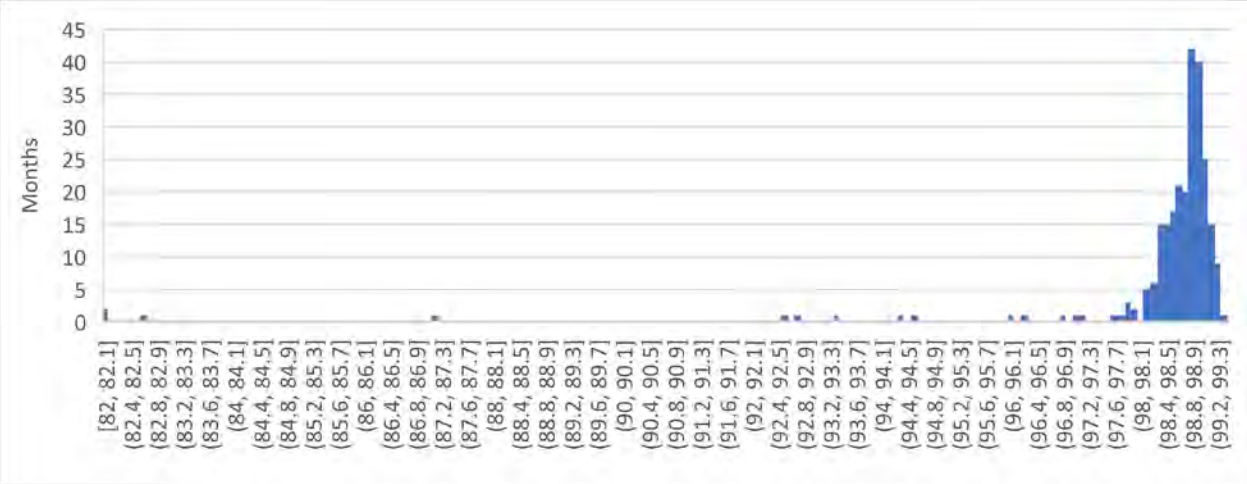
Introduction

This Technical Appendix describes the data and methods used to derive the performance standards for the (1) Meter Reading & Billing service quality adjustment, (2) Trouble, Non-Outage service quality adjustment, (3) Network Speed service quality adjustment, and (4) Faster Outage Notification service quality adjustment. This Technical Appendix will be updated to include data and methods used to derive the performance standards for (5) the Customer Satisfaction service quality adjustment and resubmitted with its subsequent proposed filing to the Commission.

Meter Reading & Billing

The Company compiled monthly percent read data for each month January 2002 through December 2022. Monthly percent read is the percent of meters read, not estimated, each calendar month. The Company compiled this dataset using the 2005-2022 Annual Reports contained within Docket No. 3628 and annual reports for 2002-2004 on record by the Company. The Company did not have any annual reports on digital record from prior to 2002, so January 2002 is the earliest practical date to include in this dataset. The Company had not pulled any data for 2023, so December 2022 is the most recent practical date to include in this dataset.

Figure 1: Histogram of Monthly Percent Read

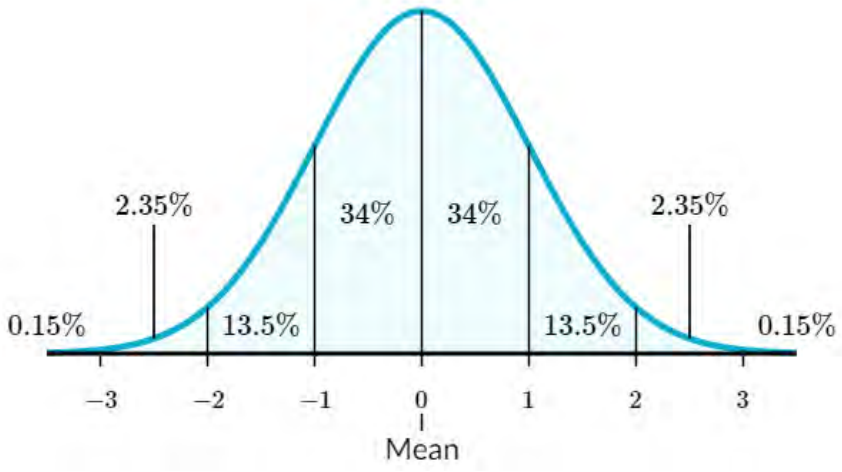


Notes: Data are monthly percent of meters read from January 2002 through December 2022 (N=252 months). Histogram shows number of months with percent of meters read within 0.1% bins. 0.1% is the most granular level of detail consistent across the entire data set.

Figure 1 shows a histogram of the data. The height of each bar corresponds to the number of months with percent meters read within the interval denoted on the horizontal axis. The mean of the full data set is 98.41%, and the median is 98.90%. The minimum value is 82% and the maximum value is 99.32%.

The data is skewed left, meaning that the data is not symmetrical and, by definition, not distributed normally.[1] Therefore, it would be inappropriate to characterize the data using mean and standard deviation. A more appropriate approach is to characterize the data using percentiles. Using percentiles that correspond to the amount of data contained within one and 2.5 standard deviations of the mean is a reasonable way to parallel the target and threshold structure of the other service quality adjustments. For normally distributed data, 68.2% of data lie within one standard deviation of the mean and 98.8% of data lie within 2.5 standard deviations of the mean (Figure 2 illustrates this).

Figure 2: Normally Distributed Data



Notes: Figure illustrates the proportion of data (percent label) within each interval of a normally distributed dataset. The horizontal axis at 0 indicates the mean of the data and the other values represent the mean plus or minus that value of standard deviation. The figure is sourced from https://www.khanacademy.org/math/statistics-probability/modeling-distributions-of-data/normal-distributions-library/a/normal-distributions-review#:~:text=Normal%20distributions%20come%20up%20time,falls%20within%201%20standard%20deviation.

These proportions correspond to percentiles in our skew-left distribution: mean minus 2.5 standard deviations corresponds to the value at the 0.6 percentile, mean minus one standard deviation corresponds to the value at the 15.9 percentile, mean plus one standard deviation

[1] See for example: https://www.khanacademy.org/math/statistics-probability/modeling-distributions-of-data/normal-distributions-library/a/normal-distributions-review#:~:text=Normal%20distributions%20come%20up%20time,falls%20within%201%20standard%20deviation.

corresponds to the value at the 84.1 percentile, and mean plus 2.5 standard deviations corresponds to the value at the 99.4 percentile. This conversion retains having 68% of data within one standard deviation and 98.8% of data within 2.5 standard deviations. Using these percentiles, we arrive at the target and threshold values in Table 1, below.

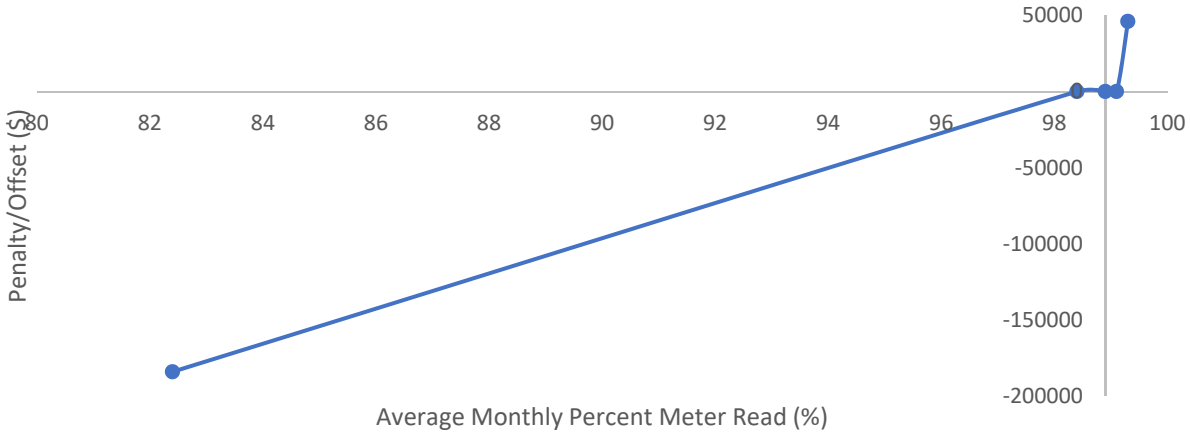
Table 1: Target and Threshold Values

Significance	Statistic for Normal Distribution	Corresponding Percentile for Non-Normal Distribution	Monthly Percent Meter Read Value
Threshold for maximum penalty	Mean minus 2.5 standard deviations	0.6 percentile	82.4%
Lower threshold for dead band	Mean minus one standard deviation	15.9 percentile	98.4%
Target	Mean	50.0 percentile	98.9%
Upper threshold for dead band	Mean plus one standard deviation	84.1 percentile	99.1%
Threshold for maximum offset	Mean plus 2.5 standard deviations	99.4 percentile	99.3%

Notes: Calculations based on data for January 2022 through December 2022 (n=252 months). Calculation performed using excel function percentile.inc.

The service quality adjustment based on these target and threshold values is illustrated in Figure 3.

Figure 3: Proposed Meter Reading and Billing Service Quality Adjustment

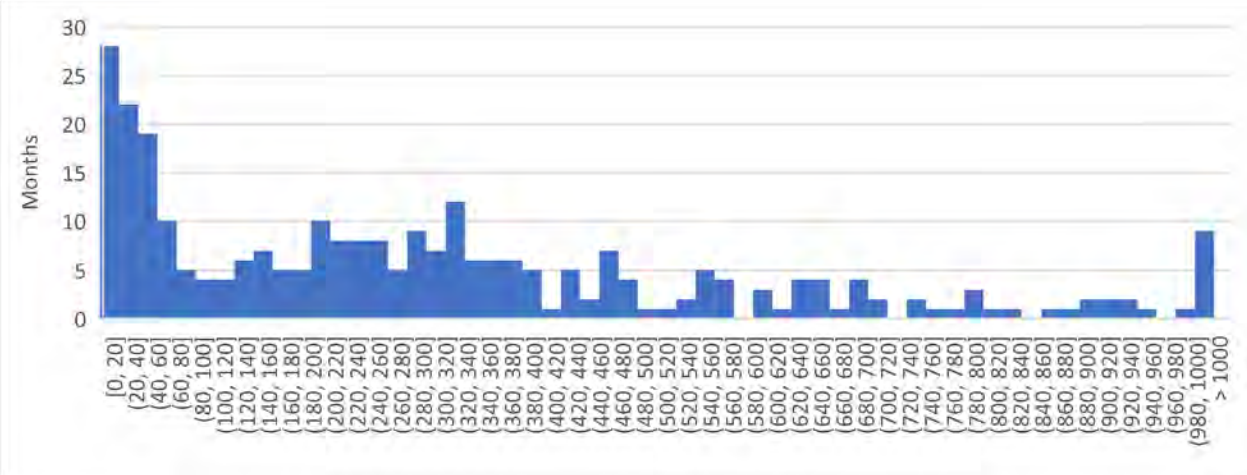


Notes: Figure reflects target and thresholds determined using above analysis. Proposed maximum penalty and offset discussed in further detail in pre-filed joint testimony.

Trouble Non-Outage

The Company compiled Trouble Non-Outage call volume per month for January 2002 through August 2023.[2] The Company compiled this dataset using the 2005-2022 Annual Reports contained within Docket No. 3628 and annual reports for 2002-2004 on record by the Company. The Company did not have any annual reports on digital record from prior to 2002, so January 2002 is the earliest practical date to include in this dataset. Trouble Non-Outage classification is based on assessment and categorization by the customer contact center service representative who responded to the customer call. Trouble Non-Outage calls include calls regarding dim lights, low voltage, half-power, flickering lights, reduced TV picture size, high voltage, frequently burned-out bulbs, motor running problems, damaged appliances and equipment, computer operation problems and non-interruptions related inquiries.

Figure 1: Histogram of Trouble Non-Outage Call Volume



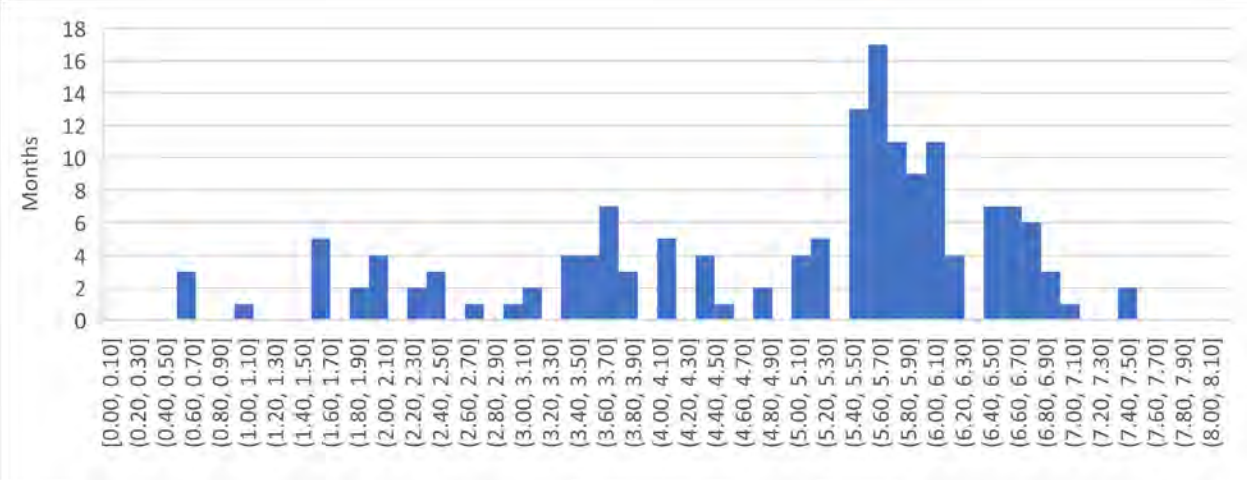
Notes: Data are monthly trouble non-outage call volume from January 2002 through August 2023 (N=260 months). Histogram shows number of months with trouble non-outage call volume within 20-call bins. The histogram is truncated at 1000 trouble non-outage calls per month (n=9 months, 3.5% of sample).

Figure 1 shows a histogram of the data. The height of each bar corresponds to the number of months with trouble non-outage call volume within the interval denoted on the horizontal axis. The mean of the full data set is 327.5 calls, and the median is 243 calls. The minimum value is zero calls, and the maximum value is 3,567 calls.

[2] The Company happened to have 2023 data on hand when conducting its analysis. Excluding 2023 data does not have a substantial effect on results. The Company recommends including 2023 data in order to increase sample size of the limited subset of data used to derive the target and thresholds, as explained further in this section.

The data are not symmetrical and do not exhibit a central tendency, therefore the data are not normally distributed.[3] The skew right tail of the data suggest a log-normal distribution may be a more accurate characterization of the data.

Figure 2: Histogram of Natural Log Transformed Data

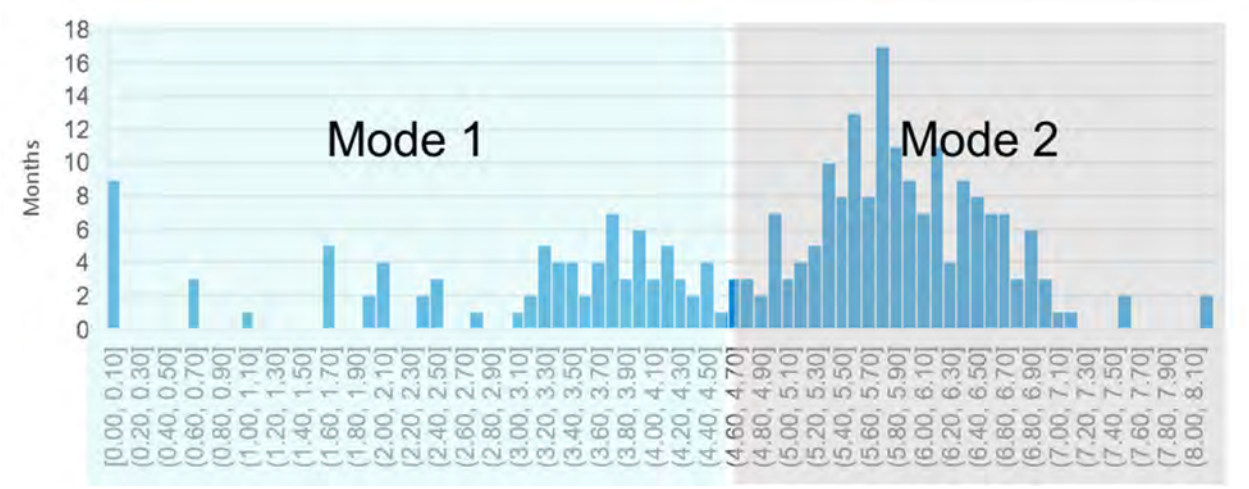


Notes: Data are monthly trouble non-outage call volume from January 2002 through August 2023 (N=260 months) with each data point transformed by taking the natural log. Histogram shows number of months with transformed trouble non-outage call volume within transformed bins.

Figure 2 shows a histogram of the data transformed using natural log. If the data were characterized as a log-normal distribution, then plotting the histogram using log-transformed data would follow a normal distribution. However, the histogram in Figure 2 appears to follow a bimodal distribution (suggested by the two 'humps' of data). A bimodal distribution can sometimes be caused by an external event that fundamentally changes the data from before to after the event. In such cases, the data before the event and the data after the event may be described as each having their own distinct distribution. Figure 3 below overlays boxes to further delineate between the two modes in Figure 2.

[3] The difference between the mean (327.5) and median (243) further supports the conclusion that the full dataset should not be characterized as normally distributed (i.e., the mean is 35% larger than the median).

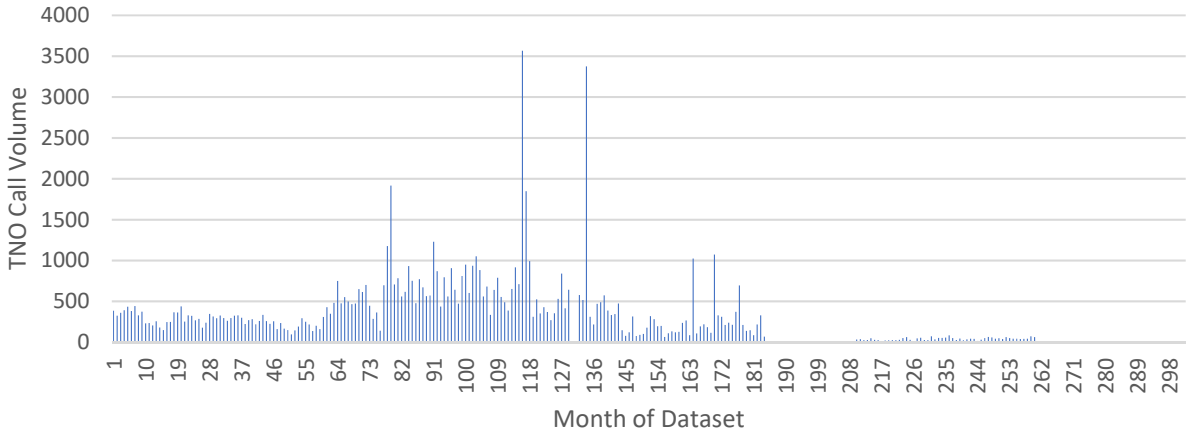
Figure 3: Illustration of Bimodal Natural Log Transformed Data



Notes: Figure 3 recreates Figure 2 with overlaid boxes to illustrate the bimodal nature of the dataset.

Visual inspection of Figure 3 suggests that it is not unreasonable to assume the data comprising Mode 1 primarily correspond to data with ln(TNO) < 4.5, and the data comprising Mode 1 primarily correspond to data with ln(TNO) > 4.5. Using this demarcation to assign each data point (TNO call volume in a particular month) to either Mode 1 or Mode 2 can reveal insights. In doing so, data from January 2022-December 2013 exclusively belong to Mode 2, data from January 2014-April 2018 have mixed assignments, and data from May 2018-August 2023 exclusively belong to Mode 1. Therefore, the data indeed suggest that the full dataset may actually be comprised of two distinct data subsets, and the pattern of assignment suggests that an event may have occurred within 2014-2018 that may have fundamentally altered the nature of trouble non-outage call volumes. Figure 4 shows monthly trouble non-outage call volume plotted sequentially across the time period January 2002 through August 2023, providing suggestive visual evidence that trouble non-outage call volumes tended to be relatively lower in more recent years.

Figure 4: Monthly Call Volume Trend

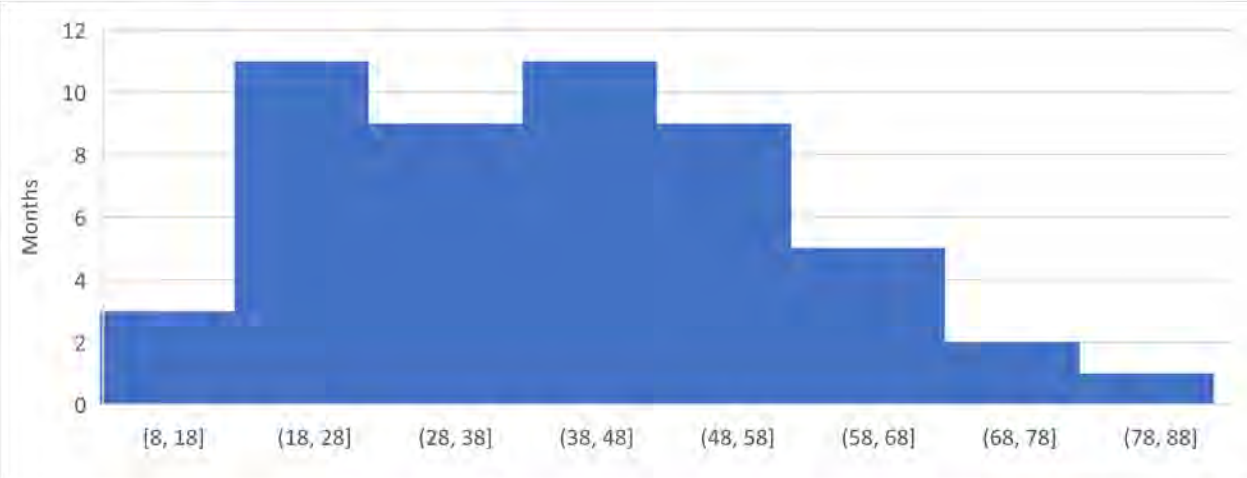


Notes: Data are monthly trouble non-outage call volumes for January 2002 (month 1 of dataset) through August 2023 (month 260 of dataset).

Further internal discussions confirmed that such an event did occur. The Company transitioned its customer call center staff to using a new software, with full deployment in mid-2019. During deployment, it is reasonable to assume that staff were less focused on accurately classifying calls, which may have resulted in the low recorded data volumes in 2017 through mid-2019. Accordingly, those data points should be considered erroneous outliers and removed from the sample prior to further analysis.

In disaggregating these two data subsets, the Company concludes that it would be most appropriate to use data from June 2019 through August 2023, which best represent current trouble non-outage call volumes, to derive the target and threshold values. Figure 5 replots a histogram of this data subset, which looks to be more symmetrical about a single central mode. The mean of this data subset is 40.96 calls, and the median of this data subset is 41 calls. The closeness of the mean and the median support the conclusion that this data subset is appropriately characterized as normal, and therefore the mean and standard deviation can be used to derive the target and thresholds for the service quality adjustment.

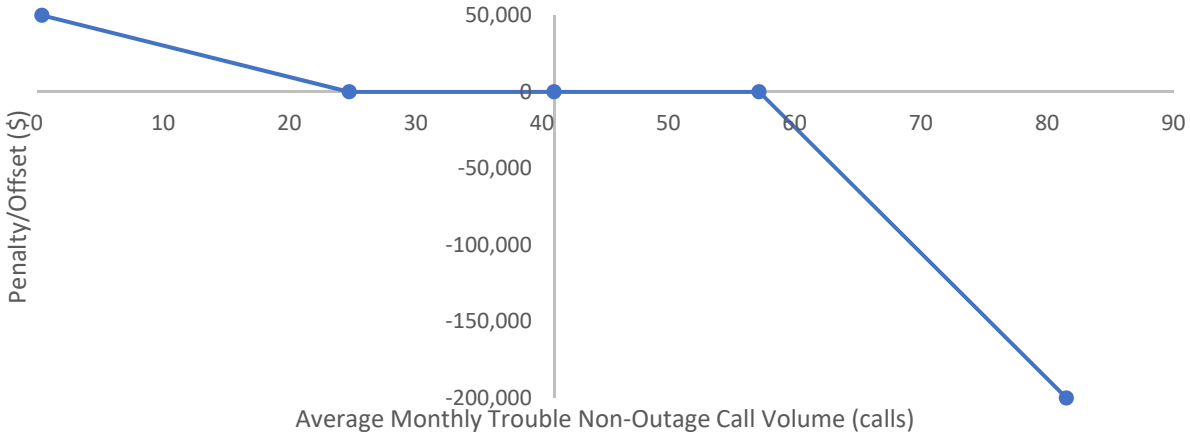
Figure 5: Histogram of Data Subset, June 2019-August 2023



Notes: Data are monthly trouble non-outage call volume from June 2019 through August 2023 (n = 51 months). Histogram shows number of months with trouble non-outage call volume within bins.

The mean is 40.96 calls and the standard deviation is 16.22 calls. Using these statistics, the target is set at the mean (40.96 calls) and the thresholds for the dead band are set at the mean plus or minus one standard deviation (24.74 calls to 57.19 calls). The thresholds for the maximum penalty and offset are set at the mean plus or minus 2.5 standard deviations (0.40 calls and 81.52 calls, respectively). Figure 6 illustrates the structure of the service quality adjustment using these target and threshold values.

Figure 6: Proposed Trouble Non-Outage Service Quality Adjustment



Notes: Figure reflects target and thresholds determined using above analysis. Proposed maximum penalty and offset discussed in further detail in pre-filed joint testimony.

Network Speed

Network speed is the measure of time required for an interval of raw electric data to travel from the customer's meter to being displayable to the customer via the customer portal. The following series of illustrations describes the Company's proposed measurement methodology.

Measuring Network Speed

Measuring Network Speed

Measuring Network Speed

Data for Customer a
on Day 1
at Interval 96 (11:45pmmidnight)

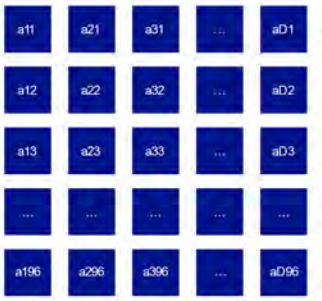
This column represents a full day of data (96 intervals of data) for one customer

Measuring Network Speed

Data for Customer a
on Day 2

Measuring Network Speed

Rhode Island Energy



Each row represents all data for a single interval for a single customer

Each column represents all data for a single day for a single customer

Data for Customer a across D days with 96 intervals per day

This matrix represents all data for a single customer during the network speed test period

Measuring Network Speed

Rhode Island Energy

We can calculate how long each packet of data takes to travel from Customer a's meter to the customer data portal using the timestamps associated with the data. For example, packet a32 may take 30 minutes 15 second (30.25 min).

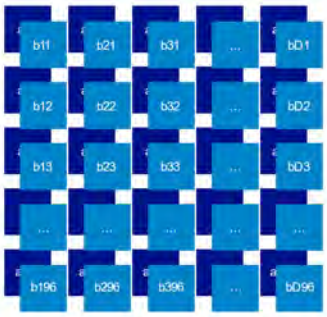
We average across all of a single customer's packets' travel times to get an average "network speed" for that customer– let's say Customer a's network speed is 43.75 min.

Average Network Speed for Customer a

For the sake of the example, let's say Customer a's average network speed is 43.75 min.

Measuring Network Speed

Rhode Island Energy



Repeat for Customer b…

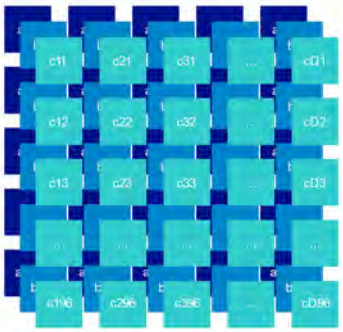
Average Network Speed for Customer b:

30.10 min

Confidential

Measuring Network Speed

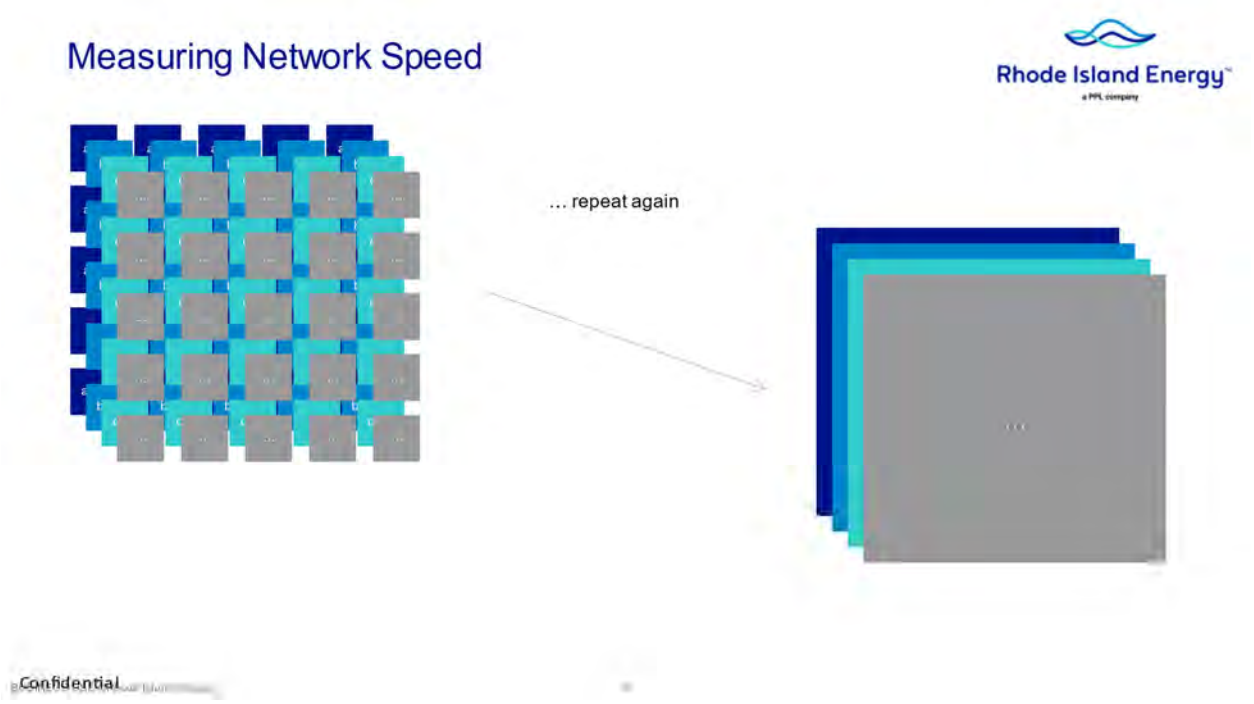
Rhode Island Energy

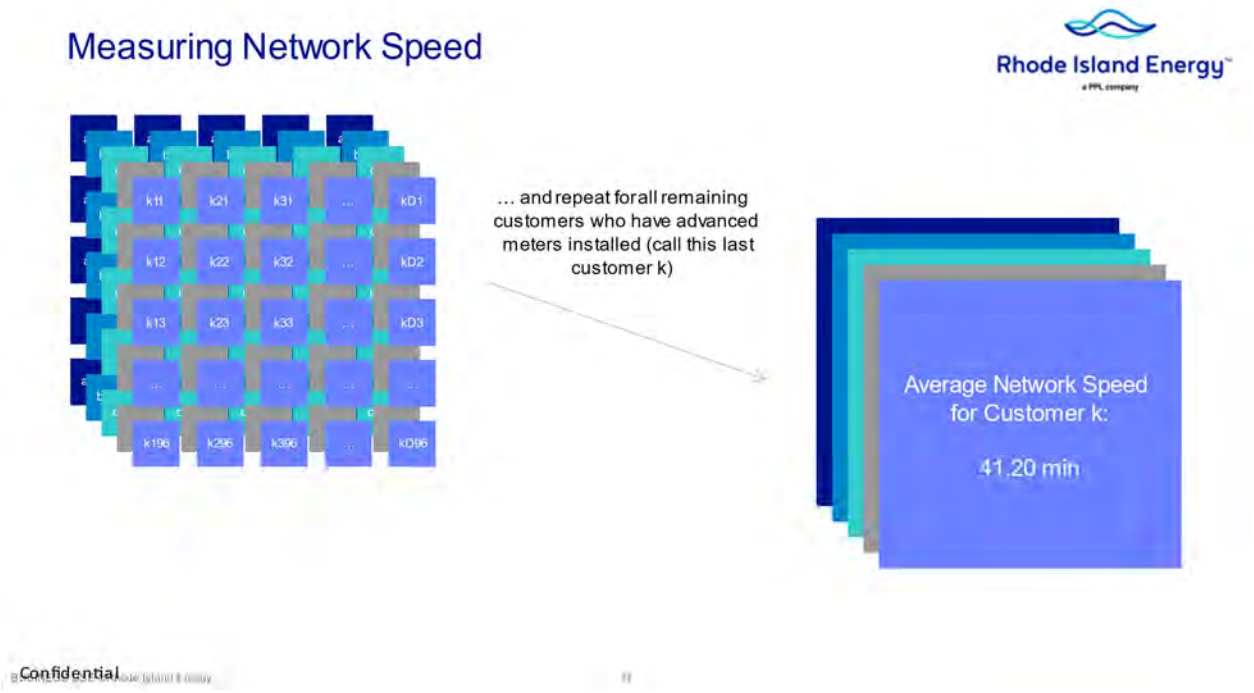


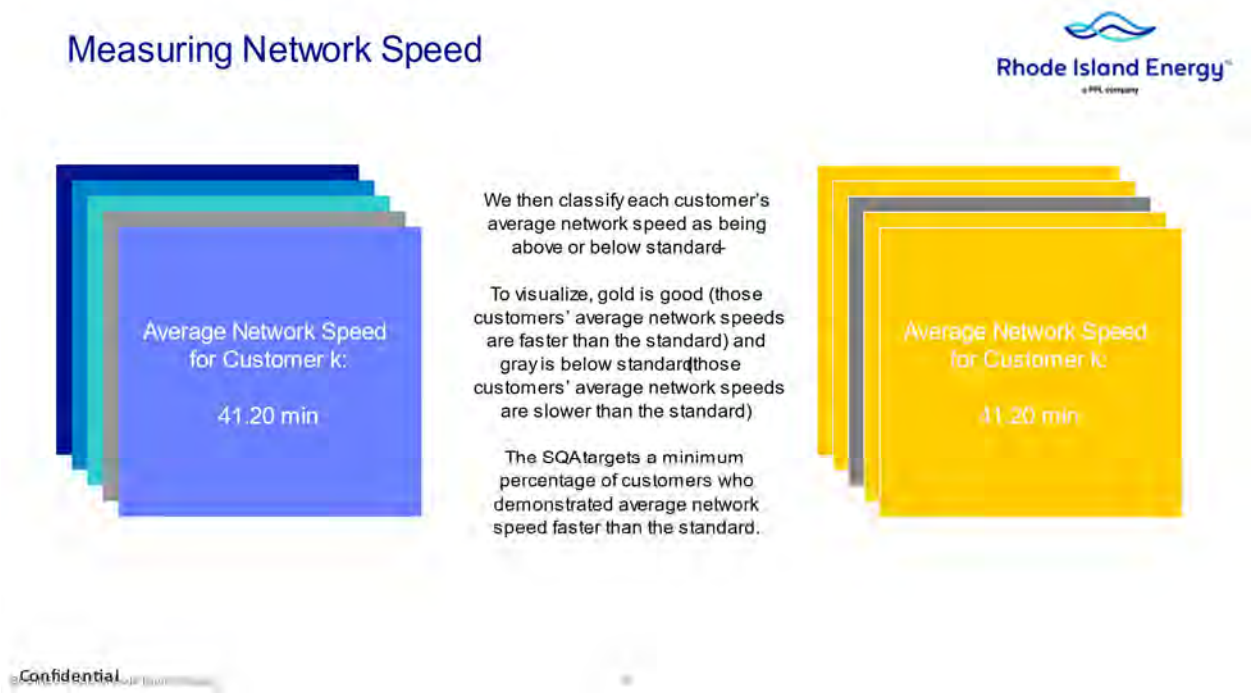
Repeat for Customer c…

Average Network Speed for Customer c:

47.68 min


Measuring Network Speed
Rhode Island Energy
… repeat again
Confidential


Measuring Network Speed
Rhode Island Energy
k11
k21
k31
kD1
k12
k22
k32
kD2
k13
k23
k33
kD3
k196
k296
k396
kD96
… and repeat for all remaining customers who have advanced meters installed (call this last customer k)
Average Network Speed for Customer k:
41.20 min
Confidential


Measuring Network Speed
Rhode Island Energy
Average Network Speed for Customer k:
41.20 min
We then classify each customer's average network speed as being above or below standard.
To visualize, gold is good (those customers' average network speeds are faster than the standard) and gray is below standard (those customers' average network speeds are slower than the standard)
The SQA targets a minimum percentage of customers who demonstrated average network speed faster than the standard.
Average Network Speed for Customer k:
41.20 min
Confidential

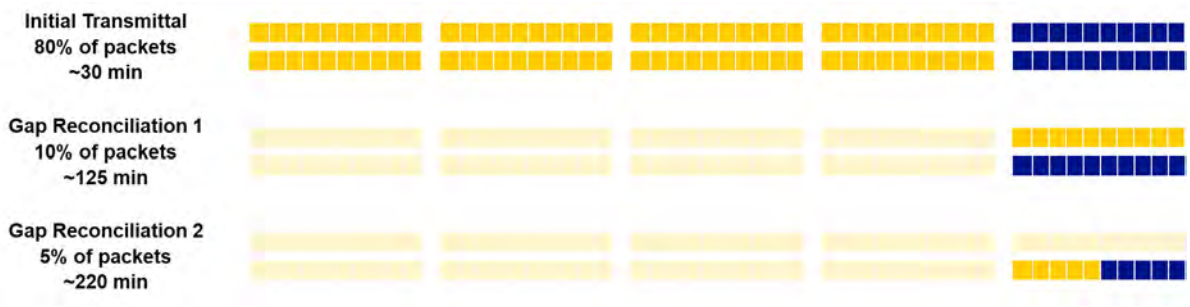
To summarize: The Company will collect raw (non-VEE) electric interval data timestamped at the meter and at the customer portal, representing the time at which the data is displayable to the customer. Data is only collected for customers with advanced meters. Cleaned data will remove all customer-interval data for which speed was (i) affected by external communications networks external to the Company's control as evidenced by a flag attached to the data by the Head-End System ("HES") or (ii) affected by local power outages as evidenced by a flag attached to the data by the customers meter.

Cleaned data will be used to calculate average network speed for each customer by averaging the difference in timestamps (in minutes) across all intervals *i*:

$$Average\ Network\ Speed\ per\ Customer = \frac{\sum_{Interval=1}^{Interval=I}(Timestamp_{Portal} - Timestamp_{meter})_i}{Number\ Intervals}$$

The performance standard is calculated at the percent of customers with average network speed equal to or faster than 45 minutes. The Performance Target of 45 minutes is derived from the actual process used to transmit the data from the meter to the customer portal. Given 100 packets (each box in Figure 1 below), the Company expects 80% of packets to be transmitted from the meter to the HES in less than or equal to 20 minutes. The remaining 20% of packets are not transmitted. To remedy this "gap," the HES conducts "gap reconciliation" whereby the HES reaches back out to the meter to attempt to collect the missing packets. Gap reconciliation is iterative and may occur multiple times. Each gap reconciliation is expected to recover about half of the missing packets; those packets take longer and longer to reach the HES through the gap reconciliation process. All packets are expected to take 10 minutes to travel from the HES to the customer portal.

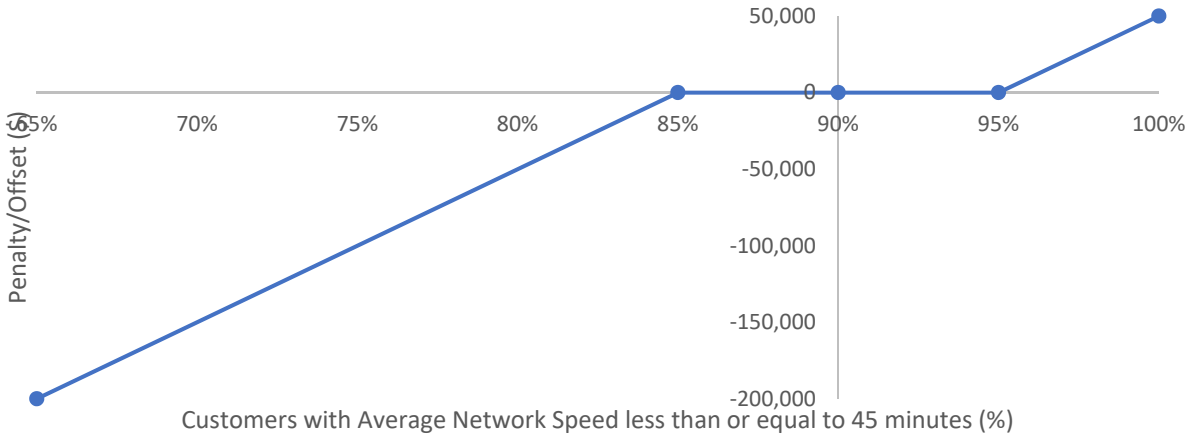
Figure 1: Illustration of Gap Reconciliation



Notes: Each box represents a packet of data (also referred to as an "interval" of data that corresponds to data collected during a 15-minute period). Dark and light yellow indicates successful transmission. Navy indicates unsuccessful transmission. Note that there may be more than two gap reconciliations in this process.

Note that more than three gap reconciliations may occur. However, in the scenario in which only two gap reconciliations are required, the weighted average network speed would be 47.5 minutes (80% * 30 min + 10% * 125 min + 5% * 220 min = 47.5 min). Ultimately, how many gap reconciliations are needed for a given customer is dependent on the location of the customer and the communications network; some customers will need more gap reconciliations and some customers will need fewer gap reconciliations. We anticipate Rhode Island's condensed density and relatively flat topography will result in fewer customers' data needing gap reconciliation. Therefore, the Company proposes a target of 90% of customers' data having an average network speed of 45 minutes or faster. Figure 2 illustrates the proposed service quality adjustment.

Figure 2: Proposed Network Speed Service Quality Adjustment



Notes: Figure reflects target and thresholds determined using above analysis. Proposed maximum penalty and offset discussed in further detail in pre-filed joint testimony.

Faster Outage Notification

The data collected to calculate Faster Outage Notification are the timestamps of Last Gasp meter outage notifications and timestamps of customer-initiated notifications to the Company of an outage. The Company will compile a dataset of the first Last Gasp meter outage notification and the first customer-initiated notification for each outage over the 12-month test period. The dataset will only include timestamp information for outages where both a Last Gasp meter outage notification and a customer-initiated notification were received. The faster outage notification metric will be calculated using the difference in these timestamps, measured in minutes, and then calculating a simple average across all outage instances:

$$Faster\ Outage\ Notification = \frac{\sum_{Outage=1}^{Outage=O}\left(Timestamp_{call} - Timestamp_{last\ gasp}\right)_o}{Number\ Outages}$$

Schedule 2: Technical Appendix Data

Please see the Excel version of Schedule 2: Technical Appendix Data.

~~NATIONAL GRID~~RHODE ISLAND ENERGY
2024~~15 AMENDED~~ ELECTRIC SERVICE QUALITY PLAN

The Narragansett Electric Company d/b/a ~~National Grid~~Rhode Island Energy ("Company") shall establish the performance standards for reliability and customer service that are set forth in this document. The standards are designed as a penalty-only approach, under which the Company would be penalized if its performance did not meet the standards. The Company receives no reward for performance which exceeds the standards. However, positive performance in one category can be used to offset penalties in other categories within a given year. The Company shall file annually by May 1 a report of its performance during the prior calendar year under the performance standards in this plan. Any net penalty balance reflected in the Company's annual report shall be credited to customers in a manner determined by the Rhode Island Public Utilities Commission ("PUC") at that time.

The maximum penalty authorized under the standards set forth below is $2.9~~2~~ million per year. The performance standards set forth below shall be in effect for the calendar year 2024~~07~~ and continue ~~through 2009 or~~ until they are modified by the Commission.

NOTE: When interpreting the performance standards that follow, please note that pages 6 through 8 of this Exhibit contain definitions of terms used in the standards.

~~NATIONAL GRID~~RHODE ISLAND ENERGY
202~~4~~15 ~~AMENDED~~ ELECTRIC SERVICE QUALITY PLAN

FREQUENCY OF INTERRUPTIONS PER CUSTOMER SERVED

Year	SAIFI*
2004	0.91
2003	1.08
2002	0.97
2001	1.09
2000	0.97
1999	0.94
1997	0.89
1996	0.75
1995	0.90

		Log Average	-0.063		
		Log Std. Dev.	0.112		
	-2 Std. Dev.	-1 Std. Dev.	Mean	+1 Std. Dev.	+2 Std. Dev.
Log Normal	-0.288	-0.175	-0.063	0.050	0.162
SAIFI	0.75	0.84	0.94	1.05	1.18

PERFORMANCE STANDARD – SAIFI (System Average Interruption Frequency Index)

SAIFI Company Target	(Penalty)
More than 1.18	($916,000)
1.06-1.18	Linear interpolation
0.84-1.05	$0
0.75-0.83	Linear interpolation
Less than 0.75	$229,000

* The calculations are based on the IEEE Std. 1366-2003 2.5β methodology for the Company. Major Event Day results are removed from these calculations but reported. The target bands are calculated considering the lognormal nature of the data. To do this, the lognormal mean and lognormal standard deviation are calculated and applied in lognormal space, which is done by applying the mean, 1 standard deviation, and 2 standard deviations and then converting back to normal space.

$$SAIFI = \frac{Total\ Number\ of\ Customers\ Interrupted}{Total\ Number\ of\ Customers\ Served}$$

~~NATIONAL GRID~~RHODE ISLAND ENERGY
202~~3~~415 ~~AMENDED~~ ELECTRIC SERVICE QUALITY PLAN

DURATION OF INTERRUPTIONS PER CUSTOMER SERVED

Year	SAIDI*
2004	66.1
2003	74.9
2002	71.0
2001	69.0
2000	60.2
1999	52.3
1997	42.2
1996	40.9
1995	51.9

		Log Average	4.051		
		Log Std. Dev.	0.224		
	-2 Std. Dev.	-1 Std. Dev.	Mean	+1 Std. Dev.	+2 Std. Dev.
Log Normal	3.604	3.827	4.051	4.275	4.498
SAIFI	36.7	45.9	57.5	71.9	89.9

PERFORMANCE STANDARD – SAIDI (System Average Interruption Duration Index)

SAIDI Company Target	(Penalty)
More than 89.9	($916,000)
72.0-89.9	Linear interpolation
45.9-71.9	$0
36.7-45.8	Linear interpolation
Less than 36.7	$229,000

* The calculations are based on the IEEE Std. 1366-2003 2.5β methodology for the Company. Major Event Day results are removed from these calculations but reported. The target bands are calculated considering the lognormal nature of the data. To do this, the lognormal mean and lognormal standard deviation are calculated and applied in lognormal space, which is done by applying the mean, 1 standard deviation, and 2 standard deviations and then converting back to normal space.

$$SAIDI\ (minutes) = \frac{Total\ Customer\ Minutes\ Interrupted}{Total\ Number\ of\ Customers\ Served}$$

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202~~4~~15 ~~AMENDED~~ ELECTRIC SERVICE QUALITY PLAN

CUSTOMER SATISFACTION

CONTINUATION OF EXISTING CUSTOMER CONTACT SURVEY

The following service quality adjustment is in effect through the end of the calendar month that is five months following the start of advanced meter installation.[1]

CUSTOMER CONTACT SURVEY

Month	% Satisfied*
August 2013	87.7%
September 2013	86.8%
October 2013	86.0%
November 2013	83.3%
December 2013	87.5%
January 2014	85.8%
February 2014	82.4%
March 2014	81.7%
April 2014	84.1%
May 2014	78.7%
June 2014	80.3%
July 2014	90.5%
August 2014	81.7%
September 2014	84.7%
October 2014	89.8%
November 2014	82.3%
December 2014	85.5%
January 2015	83.6%
February 2015	76.1%
March 2015	78.7%
April 2015	75.5%
May 2015	79.1%
June 2015	83.0%
July 2015	82.2%
Mean	83.2%
Standard Deviation	4.4%

PERFORMANCE STANDARD – Customer Contact (Existing)

% Satisfied Target	(Penalty)/Offset
Less than 74.4%	($184,000)

[1] See Docket No. 22-49-EL. For example: if meter installation begins December 15, 2023, then this customer satisfaction service quality adjustment (i.e., responses to two customer contact survey questions) will remain in effect through May 31, 2024.

	74.4% - 78.7%	Linear interpolation
	78.8% - 87.6%	$0
	87.7% - 92.0%	Linear interpolation
	More than 92.0%	$46,000

The calculations are based on responses from customers of the Company based on surveys performed by an independent third-party consultant. A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Overall survey results are based on a composite measure of responses from customers to the following 2 questions taken from ~~National Grid's~~Rhode Island Energy's contactor survey: (1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by National Grid? (2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied" and 10 means "satisfied". The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question.

UPDATE OF CUSTOMER SATISFACTION SERVICE QUALITY ADJUSTMENT

The following service quality adjustment is in effect beginning the first full calendar month six months following the month of the start of advanced meter installation.[2]

The updated customer satisfaction service quality adjustment is the average of individual satisfaction scores for four questions: three questions in the customer contact survey and one question in the Company's "Quarterly Customer Satisfaction Survey."

Customer Contact Survey

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Survey results are based on a composite measure of responses from customers to the following 3 questions taken from Rhode Island Energy's contactor survey:

[2] For example: if meter installation begins December 15, 2023, then this customer satisfaction service quality adjustment (i.e., responses to three customer contact survey questions and responses to one quarterly customer satisfaction question) will commence beginning June 1, 2024.

(1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by Rhode Island Energy?

(2) Overall, on a scale from 1 to 10, where 1 means “dissatisfied” and 10 means “satisfied”, how satisfied are you with the quality of the service provided by the telephone representative?

(3) Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied"/”unacceptable” and 10 means "satisfied"/”outstanding”.

Quarterly Customer Satisfaction Survey

A vendor surveys a random sample of the Company's customers in order to determine their level of satisfaction with the Company. For the purpose of the customer satisfaction service quality adjustment, the Company will use survey results from customers to the following question:

(4) Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

Responses to this question will be aggregated across four quarterly customer satisfaction surveys each calendar year. The individual satisfaction score for this question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "unacceptable" and 10 means "outstanding".

“Percent Satisfied” Composite Score

The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question. The performance standard, below, will be recalculated using (i) the existing customer satisfaction mean and standard deviation derived from August 2013-July 2015 data for questions (1) and (2) and (ii) the mean and standard deviation of responses to questions (3) and (4) during a 12-month baseline period; the updated mean and standard deviation will be a simple arithmetic average of the composite score.[3]

[3] The Company will file a compliance filing with the Rhode Island Public Utilities Commission within four months of the start of meter installation. The compliance filing will include a redlined Service Quality Plan updated to reflect the proposed updated mean and standard deviation (“Std. Dev.”) for the customer satisfaction performance standard.

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PERFORMANCE STANDARD – Customer Satisfaction (to be updated)	
Percent Satisfied Target	**(Penalty)/Offset**
Less than *Target – Threshold*	($184,000)
Target – Threshold to *Target – Threshold*	Linear interpolation
Target +/- Threshold	$0
Target + Threshold to *Target + Threshold*	Linear interpolation
More than *Target + Threshold*	$46,000

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TELEPHONE CALLS ANSWERED WITHIN 20 SECONDS

Year	Percent of Calls Answered Within 20 Secs*
2004	94.1%
2003	93.3%
2002	84.0%
2001	50.4%
2000	76.7%
1999	76.9%
1998	80.9%
1997	76.7%
1996	70.2%
Mean	78.1%
Standard Deviation	12.3%

PERFORMANCE STANDARD – Telephone Calls Answered within 20 Seconds

% Calls Answ Within 20 Seconds Target	(Penalty)/Offset
Less than 53.5%	($184,000)
53.5% - 65.7%	Linear interpolation
65.8% - 90.4%	$0
90.5% - 100.0%	Linear interpolation

The percent of calls answered within 20 seconds is calculated by dividing the number of calls answered within 20 seconds by the total number of calls answered during the year. "Calls answered," include calls answered by a customer service representative ("CSR") and calls completed within the Voice Response Unit ("VRU"). The time to answer is measured once the customer makes a selection to either speak with a CSR or use the VRU. VRU calls are included beginning in the year 2000.

$$Percent\ of\ Calls\ Answered\ Within\ 20\ Seconds = \frac{Total\ Calls\ Answered\ Within\ 20\ Seconds}{Total\ Calls\ Answered}$$

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METER READING & BILLING

Meter Reading & Billing performance standards are determined using percentiles based on monthly data spanning January 2013 through December 2022.

PERFORMANCE STANDARD – Meter Reading & Billing

Average Percent Meters Read per Month	(Penalty)/Offset
Less than 82.4%%	($184,000)
82.4% - 98.4%	Linear interpolation
98.4% - 99.1%	$0
99.1% - 99.3%	Linear interpolation
More than 99.3%	$46,000

Rhode Island Energy will report percent meters read per month for January through December, annually. Performance is calculated as the average percent meters read per month using the formula below. The Company will exclude months with Major Event Day results from performance calculations; the Company will continue to report percent meter reads for months with Major Event Days in its Annual Report.

$$Meter\ Reading\ \&\ Billing\ Performance = \frac{\sum_{January}^{December} Percent\ Meters\ Read/Month}{12}$$

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TROUBLE NON-OUTAGE

Trouble Non-Outage refers to customer calls regarding power quality issues but not including outages. Trouble Non-Outage performance standards are determined using mean and sample standard deviation of monthly data June 2019 through August 2023.

PERFORMANCE STANDARD – Trouble Non-Outage

Average Trouble, Non-Outage Call Volume per Month	(Penalty)/Offset
More than 81.52 calls	($184,000)
57.19 – 81.52 calls	Linear interpolation
24.74 – 57.19 calls	$0
0.40 – 24.74 calls	Linear interpolation
0 – 0.40 calls	$46,000

Rhode Island Energy will report trouble non-outage ("TNO") call volume per month for January through December, annually. Performance is calculated as the average trouble, non-outage call volume per month:

$$Trouble, NonOutage\ Performance = \frac{\sum_{January}^{December} TNO\ Call\ Volume/Month}{12}$$

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NETWORK SPEED

Network Speed is a one-time service quality adjustment to be measured in the 30-day span ("test period") commencing following "full project implementation" as determined by the execution of the "final project acceptance" milestone between PPL, Rhode Island Energy, and its advanced metering functionality vendor. The service quality adjustment will be assessed within the annual report for the calendar year that contains the last day of the 30-day test period.

PERFORMANCE STANDARD – Network Speed

Percent of Customers with Average Network Speed <= 45 minutes	(Penalty)/Offset
Less than 65%	($200,000)
65 – 85%	Linear interpolation
85 – 95 %	$0
95 – 100%	Linear interpolation
100%	$50,000

The data collected to calculate Network Speed is raw (non-VEE) 15-minute electric interval usage data timestamped at the meter at the completion of the 15-minute usage period, and timestamped at the customer portal, representing the time at which data is available for the customer to view. Data is only collected for customers with advanced meters. The dataset will then be adjusted to exclude data for scenarios where external factors outside of the Company's control impact the calculation by delaying the total time for data packets to be sent all the way from the meter to the portal. These scenarios can include service interruptions to systems external to the advanced meter systems that prevent data flows and power outages to the electric distribution system that prevent data from being sent.

The adjusted data will be used to calculate average network speed for each customer by averaging the difference in timestamps (in minutes) across all intervals *i*:

$$Average\ Network\ Speed\ per\ Customer = \frac{\sum_{Interval=1}^{Interval=I}(Timestamp_{Portal} - Timestamp_{meter})_i}{Number\ Intervals}$$

The performance standard is calculated as the percent of customers with average network speed equal to or faster than 45 minutes.

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FASTER OUTAGE NOTIFICATION

Faster Outage Notification is a one-time service quality adjustment to be measured in the 12-month span ("test period") commencing following "full project implementation" as determined by the execution of the "final project acceptance" milestone between PPL, Rhode Island Energy, and its advanced metering functionality vendor. The service quality adjustment will be assessed within the annual report for the calendar year that contains the last day of the 12-month test period.

PERFORMANCE STANDARD – Faster Outage Notification

Faster Outage Notification Metric	(Penalty)/Offset
0 minutes	($200,000)
0 – 17.6 minutes	Linear interpolation
17.6 – 26.4 minutes	$0
26.4 – 33 minutes	Linear interpolation
Greater than 33 minutes	$50,000

The data collected to calculate Faster Outage Notification are the timestamps of Last Gasp meter outage notifications and timestamps of customer-initiated notifications to the Company of an outage. The Company will compile a dataset of the first Last Gasp meter outage notification and the first customer-initiated notification for each outage over the 12-month test period. The dataset will only include timestamp information for outages where both a Last Gasp meter outage notification and a customer-initiated notification were received. The faster outage notification metric will be calculated using the difference in these timestamps, measured in minutes, and then calculating a simple average across all outage instances:

$$Faster\ Outage\ Notification = \frac{\sum_{Outage=1}^{Outage=O}(Timestamp_{call} - Timestamp_{last\ gasp})_o}{Number\ Outages}$$

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DEFINITIONS OF PERFORMANCE STANDARD MEASUREMENTS

The following reliability definitions used in conjunction with the performance standards are in accordance with the Institute of Electrical and Electronics Engineers, Inc. ("IEEE") Std. 1366-2003. It is assumed that additional reliability-related definitions found in this standard are also implicit in the reliability calculations.

CUSTOMER COUNT

The number of customers either served or interrupted depending on usage.

TOTAL NUMBER OF CUSTOMERS SERVED

The average number of customers served during the reporting period. If a different customer total is used, it must be clearly defined within the report.

TOTAL NUMBER OF CUSTOMERS INTERRUPTED

The sum of the customers losing electric service for any defined grouping of interruption events during the reporting period.

TOTAL CUSTOMER MINUTES INTERRUPTED

The product of the number of customers interrupted and the interruption duration for any interruption event. Also, the sum of those products for any defined grouping of interruption events.

MAJOR EVENT

Designates an event that exceeds reasonable design and or operational limits of the electric power system. A Major Event includes at least one Major Event Day.

MAJOR EVENT DAY

A day in which the daily system SAIDI exceeds a threshold value, T_{MED}. For the purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than T_{MED} are days on which the energy delivery system experienced stresses beyond that normally expected (such as severe weather). Activities that occur on major event days should be separately analyzed and reported. The T_{MED} threshold value will be fixed at 5.34 for the years 2007 and 2008, at which time the Company's performance will be reviewed to determine if the threshold value should be re-calculated using the IEEE Std. 1366-2003 methodology.

SAIFI (System Average Interruption Frequency Index)

The system average interruption frequency index indicates how often the average customer experiences a sustained interruption over a predefined period of time. Mathematically, this equation is given in (1).

$$SAIFI = \frac{\sum Total\ Number\ of\ Customers\ Inerrupted}{Total\ Number\ of\ Customers\ Served} \qquad \text{Equation (1)}$$

To calculate the index, use equation (2) below.

$$SAIFI = \frac{\sum N_i}{N_T} = \frac{CI}{N_T} \qquad \text{Equation (2)}$$

Where:

i denotes an interruption event

CI = Customers Interrupted

N_T = Total Number of Customers Served for the Area

SAIDI (System Average Interruption Duration Index)

This index indicates the total duration of interruption for the average customer during a predefined period of time. It is commonly measured in customer minutes or customer hours of interruption. Mathematically, this equation is given in (3).

$$SAIDI = \frac{\sum Customers\ Inerruption\ Durations}{Total\ Number\ of\ Customers\ Served} \qquad \text{Equation (3)}$$

To calculate the index, use equation (4) below.

$$SAIDI = \frac{\sum r_i N_i}{N_T} = \frac{CMI}{N_T} \qquad \text{Equation (4)}$$

Where:

i denotes an interruption event

r_i = Restoration Time for each Interruption Event

CMI = Customers Minutes Interrupted

N_T = Total Number of Customers Served for the Area

EXISTING CUSTOMER CONTACT SURVEY

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Overall survey results are based on a composite measure of responses from customers to the following 2 questions taken from ~~National Grid's~~Rhode Island Energy's contactor survey: (1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by National Grid? (2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied" and 10 means "satisfied". The composite score is a simple arithmetic average of the satisfaction score from each question.

UPDATED CUSTOMER SATISFACTION SERVICE QUALITY ADJUSTMENT

The updated customer satisfaction service quality adjustment is the average of individual satisfaction scores for four questions: three questions in the customer contact survey and one question in the Company's "Quarterly Customer Satisfaction Survey."

Customer Contact Survey

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Survey results are based on a composite measure of responses from customers to the following 3 questions taken from Rhode Island Energy's contactor survey:

(1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by Rhode Island Energy?

(2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

(3) Using a 10-point scale, where 1 means "unacceptable" and 10 means "outstanding," how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied"/"unacceptable" and 10 means "satisfied"/"outstanding".

Quarterly Customer Satisfaction Survey

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A vendor surveys a random sample of the Company's customers in order to determine their level of satisfaction with the Company. For the purpose of the customer satisfaction service quality adjustment, the Company will use survey results from customers to the following question:

(4) Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

Responses to this question will be aggregated across four quarterly customer satisfaction surveys each calendar year. The individual satisfaction score for this question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "unacceptable" and 10 means "outstanding".

“Percent Satisfied” Composite Score

The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question.

QUARTERLY CUSTOMER SATISFACTION SURVEY

Rhode Island Energy contracts with a vendor to survey a random sample of 2,000 residential customers and 400 business customers in aggregate over four surveys, one conducted each quarter of the calendar year. The question of interest is: Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for this question is the percentage of respondents who provide a rating of “8", “9”, or "10" on a 10-point scale where 1 means "unacceptable" and 10 means “outstanding.”

TELEPHONE CALLS ANSWERED WITHIN 20 SECONDS

The percent of calls answered within 20 seconds is calculated by dividing the number of calls answered within 20 seconds by the total number of calls answered during the year. "Calls answered" include calls answered by a customer service representative ("CSR") and calls completed within the voice response unit ("VRU"). Abandoned calls are not considered. The time to answer is measured once the customer makes a selection to either speak with a CSR or use the VRU. VRU calls are included beginning in the year 2000.

LINEAR INTERPOLATION

(1) The actual performance or penalty each year will be calculated and the result will be scaled or interpolated linearly between the relevant two points of the results range and the relevant two points on the dollar range.

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(2) The method of determining the actual penalty, or offset, of each performance standard is determined by multiplying the value of the penalty, or offset, by the absolute value of the actual performance indicator minus the value of the first standard deviation from the mean of that indicator, divided by the value of the second standard deviation of the mean of that indicator minus the value of the first standard deviation from the mean of that indicator.

$$\$\ Penalty\ or\ Offset = Penalty\ or\ Offset\ \$\ Value * \frac{Actual - 1st\ standard\ deviation}{2nd\ standard\ deviation - 1st\ standard\ deviation}$$

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ADDITIONAL REPORTING CRITERIA

Each quarter, the Company will file a report of 5% of all circuits designated as worst performing on the basis of customer frequency.

Included in the report will be:

1. The circuit id and location.
2. The number of customers served.
3. The towns served.
4. The number of events.
5. The average duration.
6. The total customer minutes.
7. A discussion of the cause or causes of events.
8. A discussion of the action plan for improvements including timing.

~~The Company will track and report monthly the number of calls it receives in the category of Trouble, Non-Outage. This includes inquiries about dim lights, low voltage, half-power, flickering lights, reduced TV picture size, high voltage, frequently burned out bulbs, motor running problems, damaged appliances and equipment, computer operation problems and other non-Interruptions related inquiries.~~

~~The Company will report its annual meter reading performance as an average of monthly percentage of meters read.~~

For ~~4~~each event defined as a Major Event Day, the Company will prepare a report, which will be filed annually as part of the annual SQ filing, detailing the following information:

1. Start date/time of event.
2. Number/Location of crews on duty (both internal and external crews).
3. Number of crews assigned to restoration efforts.
4. The first instance of mutual aid coordination.
5. First contact with material suppliers.
6. Inventory levels: pre-event/daily/post-event.
7. Date/time of request for external crews.
8. Date/time of external crew assignment.
9. # of customers out of service by hour.
10. Impacted area.
11. Cause.
12. Weather impact on restoration.
13. Analysis of protective device operation.
14. Summary of customers impacted.

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The Narragansett Electric Company d/b/a Rhode Island Energy ("Company") shall establish the performance standards for reliability and customer service that are set forth in this document. The standards are designed as a penalty-only approach, under which the Company would be penalized if its performance did not meet the standards. The Company receives no reward for performance which exceeds the standards. However, positive performance in one category can be used to offset penalties in other categories within a given year. The Company shall file annually by May 1 a report of its performance during the prior calendar year under the performance standards in this plan. Any net penalty balance reflected in the Company's annual report shall be credited to customers in a manner determined by the Rhode Island Public Utilities Commission ("PUC") at that time.

The maximum penalty authorized under the standards set forth below is $2.9 million per year. The performance standards set forth below shall be in effect for the calendar year 2024 and continue until they are modified by the Commission.

NOTE: When interpreting the performance standards that follow, please note that pages 6 through 8 of this Exhibit contain definitions of terms used in the standards.

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FREQUENCY OF INTERRUPTIONS PER CUSTOMER SERVED

Year	SAIFI*
2004	0.91
2003	1.08
2002	0.97
2001	1.09
2000	0.97
1999	0.94
1997	0.89
1996	0.75
1995	0.90

		Log Average	-0.063		
		Log Std. Dev.	0.112		
	-2 Std. Dev.	-1 Std. Dev.	Mean	+1 Std. Dev.	+2 Std. Dev.
Log Normal	-0.288	-0.175	-0.063	0.050	0.162
SAIFI	0.75	0.84	0.94	1.05	1.18

PERFORMANCE STANDARD – SAIFI (System Average Interruption Frequency Index)

SAIFI Company Target	(Penalty)
More than 1.18	($916,000)
1.06-1.18	Linear interpolation
0.84-1.05	$0
0.75-0.83	Linear interpolation
Less than 0.75	$229,000

* The calculations are based on the IEEE Std. 1366-2003 2.5β methodology for the Company. Major Event Day results are removed from these calculations but reported. The target bands are calculated considering the lognormal nature of the data. To do this, the lognormal mean and lognormal standard deviation are calculated and applied in lognormal space, which is done by applying the mean, 1 standard deviation, and 2 standard deviations and then converting back to normal space.

$$SAIFI = \frac{Total\ Number\ of\ Customers\ Interrupted}{Total\ Number\ of\ Customers\ Served}$$

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DURATION OF INTERRUPTIONS PER CUSTOMER SERVED

Year	SAIDI*
2004	66.1
2003	74.9
2002	71.0
2001	69.0
2000	60.2
1999	52.3
1997	42.2
1996	40.9
1995	51.9

		Log Average	4.051		
		Log Std. Dev.	0.224		
	-2 Std. Dev.	-1 Std. Dev.	Mean	+1 Std. Dev.	+2 Std. Dev.
Log Normal	3.604	3.827	4.051	4.275	4.498
SAIFI	36.7	45.9	57.5	71.9	89.9

PERFORMANCE STANDARD – SAIDI (System Average Interruption Duration Index)

SAIDI Company Target	(Penalty)
More than 89.9	($916,000)
72.0-89.9	Linear interpolation
45.9-71.9	$0
36.7-45.8	Linear interpolation
Less than 36.7	$229,000

* The calculations are based on the IEEE Std. 1366-2003 2.5β methodology for the Company. Major Event Day results are removed from these calculations but reported. The target bands are calculated considering the lognormal nature of the data. To do this, the lognormal mean and lognormal standard deviation are calculated and applied in lognormal space, which is done by applying the mean, 1 standard deviation, and 2 standard deviations and then converting back to normal space.

$$SAIDI\ (minutes) = \frac{Total\ Customer\ Minutes\ Interrupted}{Total\ Number\ of\ Customers\ Served}$$

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CUSTOMER SATISFACTION

CONTINUATION OF EXISTING CUSTOMER CONTACT SURVEY

The following service quality adjustment is in effect through the end of the calendar month that is five months following the start of advanced meter installation.[1]

CUSTOMER CONTACT SURVEY

Month	% Satisfied*
August 2013	87.7%
September 2013	86.8%
October 2013	86.0%
November 2013	83.3%
December 2013	87.5%
January 2014	85.8%
February 2014	82.4%
March 2014	81.7%
April 2014	84.1%
May 2014	78.7%
June 2014	80.3%
July 2014	90.5%
August 2014	81.7%
September 2014	84.7%
October 2014	89.8%
November 2014	82.3%
December 2014	85.5%
January 2015	83.6%
February 2015	76.1%
March 2015	78.7%
April 2015	75.5%
May 2015	79.1%
June 2015	83.0%
July 2015	82.2%
Mean	83.2%
Standard Deviation	4.4%

[1] See Docket No. 22-49-EL. For example: if meter installation begins December 15, 2023, then this customer satisfaction service quality adjustment (i.e., responses to two customer contact survey questions) will remain in effect through May 31, 2024.

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PERFORMANCE STANDARD – Customer Contact (Existing)

% Satisfied Target	(Penalty)/Offset
Less than 74.4%	($184,000)
74.4% - 78.7%	Linear interpolation
78.8% - 87.6%	$0
87.7% - 92.0%	Linear interpolation
More than 92.0%	$46,000

The calculations are based on responses from customers of the Company based on surveys performed by an independent third-party consultant. A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Overall survey results are based on a composite measure of responses from customers to the following 2 questions taken from Rhode Island Energy's contactor survey: (1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by National Grid? (2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied" and 10 means "satisfied". The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question.

UPDATE OF CUSTOMER SATISFACTION SERVICE QUALITY ADJUSTMENT

The following service quality adjustment is in effect beginning the first full calendar month six months following the month of the start of advanced meter installation.[2]

The updated customer satisfaction service quality adjustment is the average of individual satisfaction scores for four questions: three questions in the customer contact survey and one question in the Company's "Quarterly Customer Satisfaction Survey."

Customer Contact Survey

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Survey results are based on a composite measure of

[2] For example: if meter installation begins December 15, 2023, then this customer satisfaction service quality adjustment (i.e., responses to three customer contact survey questions and responses to one quarterly customer satisfaction question) will commence beginning June 1, 2024.

responses from customers to the following 3 questions taken from Rhode Island Energy's contactor survey:

(1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by Rhode Island Energy?

(2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

(3) Using a 10-point scale, where 1 means "unacceptable" and 10 means "outstanding," how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied"/"unacceptable" and 10 means "satisfied"/"outstanding".

Quarterly Customer Satisfaction Survey

A vendor surveys a random sample of the Company's customers in order to determine their level of satisfaction with the Company. For the purpose of the customer satisfaction service quality adjustment, the Company will use survey results from customers to the following question:

(4) Using a 10-point scale, where 1 means "unacceptable" and 10 means "outstanding," how would you rate the reliability of electric service delivered to your home (or business)?

Responses to this question will be aggregated across four quarterly customer satisfaction surveys each calendar year. The individual satisfaction score for this question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "unacceptable" and 10 means "outstanding".

"Percent Satisfied" Composite Score

The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question. The performance standard, below, will be recalculated using (i) the existing customer satisfaction mean and standard deviation derived from August 2013-July 2015 data for questions (1) and (2) and (ii) the mean and standard deviation of responses to questions (3) and (4) during a 12-month baseline period; the updated mean and standard deviation will be a simple arithmetic average of the composite score.[3]

[3] The Company will file a compliance filing with the Rhode Island Public Utilities Commission within four months of the start of meter installation. The compliance filing will include a redlined Service Quality Plan updated to reflect the proposed updated mean and standard deviation ("Std. Dev.") for the customer satisfaction performance standard.

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PERFORMANCE STANDARD – Customer Satisfaction (to be updated)	
Percent Satisfied Target	**(Penalty)/Offset**
Less than *Target – Threshold*	($184,000)
Target – Threshold to *Target – Threshold*	Linear interpolation
Target +/- Threshold	$0
Target + Threshold to *Target + Threshold*	Linear interpolation
More than *Target + Threshold*	$46,000

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TELEPHONE CALLS ANSWERED WITHIN 20 SECONDS

Year	Percent of Calls Answered Within 20 Secs*
2004	94.1%
2003	93.3%
2002	84.0%
2001	50.4%
2000	76.7%
1999	76.9%
1998	80.9%
1997	76.7%
1996	70.2%
Mean	78.1%
Standard Deviation	12.3%

PERFORMANCE STANDARD – Telephone Calls Answered within 20 Seconds

% Calls Answ Within 20 Seconds Target	(Penalty)/Offset
Less than 53.5%	($184,000)
53.5% - 65.7%	Linear interpolation
65.8% - 90.4%	$0
90.5% - 100.0%	Linear interpolation

The percent of calls answered within 20 seconds is calculated by dividing the number of calls answered within 20 seconds by the total number of calls answered during the year. "Calls answered," include calls answered by a customer service representative ("CSR") and calls completed within the Voice Response Unit ("VRU"). The time to answer is measured once the customer makes a selection to either speak with a CSR or use the VRU. VRU calls are included beginning in the year 2000.

$$Percent\ of\ Calls\ Answered\ Within\ 20\ Seconds = \frac{Total\ Calls\ Answered\ Within\ 20\ Seconds}{Total\ Calls\ Answered}$$

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METER READING & BILLING

Meter Reading & Billing performance standards are determined using percentiles based on monthly data spanning January 2013 through December 2022.

PERFORMANCE STANDARD – Meter Reading & Billing

Average Percent Meters Read per Month	(Penalty)/Offset
Less than 82.4%%	($184,000)
82.4% - 98.4%	Linear interpolation
98.4% - 99.1%	$0
99.1% - 99.3%	Linear interpolation
More than 99.3%	$46,000

Rhode Island Energy will report percent meters read per month for January through December, annually. Performance is calculated as the average percent meters read per month using the formula below. The Company will exclude months with Major Event Day results from performance calculations; the Company will continue to report percent meter reads for months with Major Event Days in its Annual Report.

$$Meter\ Reading\ \&\ Billing\ Performance = \frac{\sum_{January}^{December} Percent\ Meters\ Read/Month}{12}$$

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TROUBLE NON-OUTAGE

Trouble Non-Outage refers to customer calls regarding power quality issues but not including outages. Trouble Non-Outage performance standards are determined using mean and sample standard deviation of monthly data June 2019 through August 2023.

PERFORMANCE STANDARD – Trouble Non-Outage

Average Trouble, Non-Outage Call Volume per Month	(Penalty)/Offset
More than 81.52 calls	($184,000)
57.19 – 81.52 calls	Linear interpolation
24.74 – 57.19 calls	$0
0.40 – 24.74 calls	Linear interpolation
0 – 0.40 calls	$46,000

Rhode Island Energy will report trouble non-outage ("TNO") call volume per month for January through December, annually. Performance is calculated as the average trouble, non-outage call volume per month:

$$Trouble, NonOutage\ Performance = \frac{\sum_{January}^{December} TNO\ Call\ Volume/Month}{12}$$

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NETWORK SPEED

Network Speed is a one-time service quality adjustment to be measured in the 30-day span ("test period") commencing following "full project implementation" as determined by the execution of the "final project acceptance" milestone between PPL, Rhode Island Energy, and its advanced metering functionality vendor. The service quality adjustment will be assessed within the annual report for the calendar year that contains the last day of the 30-day test period.

PERFORMANCE STANDARD – Network Speed

Percent of Customers with Average Network Speed <= 45 minutes	(Penalty)/Offset
Less than 65%	($200,000)
65 – 85%	Linear interpolation
85 – 95 %	$0
95 – 100%	Linear interpolation
100%	$50,000

The data collected to calculate Network Speed is raw (non-VEE) 15-minute electric interval usage data timestamped at the meter at the completion of the 15-minute usage period, and timestamped at the customer portal, representing the time at which data is available for the customer to view. Data is only collected for customers with advanced meters. The dataset will then be adjusted to exclude data for scenarios where external factors outside of the Company's control impact the calculation by delaying the total time for data packets to be sent all the way from the meter to the portal. These scenarios can include service interruptions to systems external to the advanced meter systems that prevent data flows and power outages to the electric distribution system that prevent data from being sent.

The adjusted data will be used to calculate average network speed for each customer by averaging the difference in timestamps (in minutes) across all intervals *i*:

$$Average\ Network\ Speed\ per\ Customer = \frac{\sum_{Interval=1}^{Interval=I}(Timestamp_{Portal} - Timestamp_{meter})_i}{Number\ Intervals}$$

The performance standard is calculated as the percent of customers with average network speed equal to or faster than 45 minutes.

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FASTER OUTAGE NOTIFICATION

Faster Outage Notification is a one-time service quality adjustment to be measured in the 12-month span ("test period") commencing following "full project implementation" as determined by the execution of the "final project acceptance" milestone between PPL, Rhode Island Energy, and its advanced metering functionality vendor. The service quality adjustment will be assessed within the annual report for the calendar year that contains the last day of the 12-month test period.

PERFORMANCE STANDARD – Faster Outage Notification

Faster Outage Notification Metric	(Penalty)/Offset
0 minutes	($200,000)
0 – 17.6 minutes	Linear interpolation
17.6 – 26.4 minutes	$0
26.4 – 33 minutes	Linear interpolation
Greater than 33 minutes	$50,000

The data collected to calculate Faster Outage Notification are the timestamps of Last Gasp meter outage notifications and timestamps of customer-initiated notifications to the Company of an outage. The Company will compile a dataset of the first Last Gasp meter outage notification and the first customer-initiated notification for each outage over the 12-month test period. The dataset will only include timestamp information for outages where both a Last Gasp meter outage notification and a customer-initiated notification were received. The faster outage notification metric will be calculated using the difference in these timestamps, measured in minutes, and then calculating a simple average across all outage instances:

$$Faster\ Outage\ Notification = \frac{\sum_{Outage=1}^{Outage=O}(Timestamp_{call} - Timestamp_{last\ gasp})_o}{Number\ Outages}$$

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DEFINITIONS OF PERFORMANCE STANDARD MEASUREMENTS

The following reliability definitions used in conjunction with the performance standards are in accordance with the Institute of Electrical and Electronics Engineers, Inc. ("IEEE") Std. 1366-2003. It is assumed that additional reliability-related definitions found in this standard are also implicit in the reliability calculations.

CUSTOMER COUNT

The number of customers either served or interrupted depending on usage.

TOTAL NUMBER OF CUSTOMERS SERVED

The average number of customers served during the reporting period. If a different customer total is used, it must be clearly defined within the report.

TOTAL NUMBER OF CUSTOMERS INTERRUPTED

The sum of the customers losing electric service for any defined grouping of interruption events during the reporting period.

TOTAL CUSTOMER MINUTES INTERRUPTED

The product of the number of customers interrupted and the interruption duration for any interruption event. Also, the sum of those products for any defined grouping of interruption events.

MAJOR EVENT

Designates an event that exceeds reasonable design and or operational limits of the electric power system. A Major Event includes at least one Major Event Day.

MAJOR EVENT DAY

A day in which the daily system SAIDI exceeds a threshold value, T_{MED}. For the purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than T_{MED} are days on which the energy delivery system experienced stresses beyond that normally expected (such as severe weather). Activities that occur on major event days should be separately analyzed and reported. The T_{MED} threshold value will be fixed at 5.34 for the years 2007 and 2008, at which time the Company's performance will be reviewed to determine if the threshold value should be re-calculated using the IEEE Std. 1366-2003 methodology.

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SAIFI (System Average Interruption Frequency Index)

The system average interruption frequency index indicates how often the average customer experiences a sustained interruption over a predefined period of time. Mathematically, this equation is given in (1).

$$SAIFI = \frac{\sum Total\ Number\ of\ Customers\ Inerrupted}{Total\ Number\ of\ Customers\ Served} \qquad \text{Equation (1)}$$

To calculate the index, use equation (2) below.

$$SAIFI = \frac{\sum N_i}{N_T} = \frac{CI}{N_T} \qquad \text{Equation (2)}$$

Where:

i denotes an interruption event

CI = Customers Interrupted

N_T = Total Number of Customers Served for the Area

SAIDI (System Average Interruption Duration Index)

This index indicates the total duration of interruption for the average customer during a predefined period of time. It is commonly measured in customer minutes or customer hours of interruption. Mathematically, this equation is given in (3).

$$SAIDI = \frac{\sum Customers\ Inerruption\ Durations}{Total\ Number\ of\ Customers\ Served} \qquad \text{Equation (3)}$$

To calculate the index, use equation (4) below.

$$SAIDI = \frac{\sum r_i N_i}{N_T} = \frac{CMI}{N_T} \qquad \text{Equation (4)}$$

Where:

i denotes an interruption event

r_i = Restoration Time for each Interruption Event

CMI = Customers Minutes Interrupted

N_T = Total Number of Customers Served for the Area

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EXISTING CUSTOMER CONTACT SURVEY

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Overall survey results are based on a composite measure of responses from customers to the following 2 questions taken from Rhode Island Energy's contactor survey: (1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by National Grid? (2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied" and 10 means "satisfied". The composite score is a simple arithmetic average of the satisfaction score from each question.

UPDATED CUSTOMER SATISFACTION SERVICE QUALITY ADJUSTMENT

The updated customer satisfaction service quality adjustment is the average of individual satisfaction scores for four questions: three questions in the customer contact survey and one question in the Company's "Quarterly Customer Satisfaction Survey."

Customer Contact Survey

A vendor surveys a random sample of the Company's customers who have contacted the call center recently in order to determine their level of satisfaction with their most recent contact with the Company regarding any call reason. Survey results are based on a composite measure of responses from customers to the following 3 questions taken from Rhode Island Energy's contactor survey:

(1) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the services provided by Rhode Island Energy?

(2) Overall, on a scale from 1 to 10, where 1 means "dissatisfied" and 10 means "satisfied", how satisfied are you with the quality of the service provided by the telephone representative?

(3) Using a 10-point scale, where 1 means "unacceptable" and 10 means "outstanding," how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for each question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "dissatisfied"/"unacceptable" and 10 means "satisfied"/"outstanding".

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Quarterly Customer Satisfaction Survey

A vendor surveys a random sample of the Company's customers in order to determine their level of satisfaction with the Company. For the purpose of the customer satisfaction service quality adjustment, the Company will use survey results from customers to the following question:

(4) Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

Responses to this question will be aggregated across four quarterly customer satisfaction surveys each calendar year. The individual satisfaction score for this question is the percentage of respondents who provide a rating of "8", "9", or "10" on a 10-point scale where 1 means "unacceptable" and 10 means "outstanding".

“Percent Satisfied” Composite Score

The "percent satisfied" composite score is a simple arithmetic average of the satisfaction score from each question.

QUARTERLY CUSTOMER SATISFACTION SURVEY

Rhode Island Energy contracts with a vendor to survey a random sample of 2,000 residential customers and 400 business customers in aggregate over four surveys, one conducted each quarter of the calendar year. The question of interest is: Using a 10-point scale, where 1 means “unacceptable” and 10 means “outstanding,” how would you rate the reliability of electric service delivered to your home (or business)?

The individual satisfaction score for this question is the percentage of respondents who provide a rating of “8", “9”, or "10" on a 10-point scale where 1 means "unacceptable" and 10 means “outstanding.”

TELEPHONE CALLS ANSWERED WITHIN 20 SECONDS

The percent of calls answered within 20 seconds is calculated by dividing the number of calls answered within 20 seconds by the total number of calls answered during the year. "Calls answered" include calls answered by a customer service representative ("CSR") and calls completed within the voice response unit ("VRU"). Abandoned calls are not considered. The time to answer is measured once the customer makes a selection to either speak with a CSR or use the VRU. VRU calls are included beginning in the year 2000.

LINEAR INTERPOLATION

(1) The actual performance or penalty each year will be calculated and the result will be scaled or interpolated linearly between the relevant two points of the results range and the relevant two points on the dollar range.

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(2) The method of determining the actual penalty, or offset, of each performance standard is determined by multiplying the value of the penalty, or offset, by the absolute value of the actual performance indicator minus the value of the first standard deviation from the mean of that indicator, divided by the value of the second standard deviation of the mean of that indicator minus the value of the first standard deviation from the mean of that indicator.

$$\$\ Penalty\ or\ Offset = Penalty\ or\ Offset\ \$\ Value * \frac{Actual - 1st\ standard\ deviation}{2nd\ standard\ deviation - 1st\ standard\ deviation}$$

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ADDITIONAL REPORTING CRITERIA

Each quarter, the Company will file a report of 5% of all circuits designated as worst performing on the basis of customer frequency.

Included in the report will be:

1. The circuit id and location.
2. The number of customers served.
3. The towns served.
4. The number of events.
5. The average duration.
6. The total customer minutes.
7. A discussion of the cause or causes of events.
8. A discussion of the action plan for improvements including timing.

For each event defined as a Major Event Day, the Company will prepare a report, which will be filed annually as part of the annual SQ filing, detailing the following information:

1. Start date/time of event.
2. Number/Location of crews on duty (both internal and external crews).
3. Number of crews assigned to restoration efforts.
4. The first instance of mutual aid coordination.
5. First contact with material suppliers.
6. Inventory levels: pre-event/daily/post-event.
7. Date/time of request for external crews.
8. Date/time of external crew assignment.
9. # of customers out of service by hour.
10. Impacted area.
11. Cause.
12. Weather impact on restoration.
13. Analysis of protective device operation.
14. Summary of customers impacted.