

January 10, 2020

VIA HAND DELIVERY & ELECTRONIC MAIL

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

RE: Docket 4995 - National Grid's Proposed FY 2021 Electric Infrastructure, Safety, and Reliability Plan
Responses to Division Data Requests – Set 3

Dear Ms. Massaro:

I have enclosed ten copies of National Grid's¹ responses to the Division's Third Set of Data Requests that the Company has simultaneously submitted to the Division in the above-referenced matter.

This filing also contains a Motion for Protective Treatment of Confidential Information in accordance with 810-RICR-00-00-1-1.3(H)(3) (Rule 1.3(H)) of the PUC's Rules of Practice and Procedure and R.I. Gen. Laws § 38-2-2(4)(A), -(B). National Grid seeks protection from public disclosure of certain confidential and privileged information in Attachment R-III-2-1, Attachment R-III-2-2, and Attachment R-III-4. In compliance with Rule 1.3(H), National Grid has provided the PUC with one complete, unredacted copy of the above-referenced attachments in an envelope marked, **CONTAINS PRIVILEGED AND CONFIDENTIAL INFORMATION – DO NOT RELEASE.**

Thank you for your attention to this transmittal. If you have any questions, please contact me at 401-784-7288.

Very truly yours,



Jennifer Brooks Hutchinson

Enclosure

cc: Docket 4995 Service List
Christy Hetherington, Esq.
John Bell, Division
Greg Booth, Division
Linda Kushner, Division
Al Contente, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

Certificate of Service

I hereby certify that a copy of the cover letter and any materials accompanying this certificate was electronically transmitted to the individuals listed below.

The paper copies of this filing are being hand delivered to the Rhode Island Public Utilities Commission and to the Rhode Island Division of Public Utilities and Carriers.



Joanne M. Scanlon

January 10, 2020

Date

**Docket No. 4995 - National Grid's Electric ISR Plan FY 2021
Service List as of 12/26/2019**

Name/Address	E-mail Distribution	Phone
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File an original & ten copies w/: Luly E. Massaro, Commission Clerk Public Utilities Commission 89 Jefferson Blvd. Warwick, RI 02888	Luly.massaro@puc.ri.gov ; John.harrington@puc.ri.gov ; Cynthia.WilsonFrias@puc.ri.gov ; Todd.bianco@puc.ri.gov ; Alan.nault@puc.ri.gov ; Margaret.hogan@puc.ri.gov ;	401-780-2107

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

RHODE ISLAND PUBLIC UTILITIES COMMISSION

Fiscal Year 2021 Electric Infrastructure,
Safety and Reliability Plan

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Docket No. 4995

**MOTION OF THE NARRAGANSETT ELECTRIC
COMPANY D/B/A NATIONAL GRID FOR PROTECTIVE
TREATMENT OF CONFIDENTIAL INFORMATION**

National Grid¹ hereby requests that the Rhode Island Public Utilities Commission (PUC) grant protection from public disclosure of certain confidential, competitively sensitive, and proprietary information submitted in this proceeding, as permitted by PUC Rule 810-RICR-00-00-1-1.3(H)(3) (Rule 1.3(H)) and R.I. Gen. Laws § 38-2-2(4)(A), -(B). National Grid also hereby requests that, pending entry of that finding, the PUC preliminarily grant National Grid's request for confidential treatment pursuant to Rule 1.3(H)(2).

I. BACKGROUND

On January 10, 2020, National Grid submitted responses to the Division of Public Utilities and Carriers (Division) Third Set of Data Requests (Division Data Requests), which the Division issued on December 20, 2019, the same day on which the Company filed its Fiscal Year (FY) 2021 Electric Infrastructure, Safety, and Reliability (ISR) Plan filing; therefore, the Company is simultaneously filing copies of its responses to the Division Data Requests with the PUC in the above-captioned docket. Division Data Request R-III-2 requested the Franklin Square Breaker project sanction papers, which the Company provided as Confidential Attachment R-III-2-1 and Confidential Attachment R-III-2-2. Both sanction papers contain

confidential customer information. In addition, Division Data Request R-III-4 requests breaker replacement program documentation. In response to Division Data Request R-III-4, the Company submitted the Distribution Substation Circuit Breaker and Recloser Strategy Paper as Attachment R-III-4, which contains confidential pricing information. The confidential customer identifying information in Attachment R-III-2-1 and Attachment R-III-2-2, and the confidential pricing information in Attachment R-III-4 is the type of information that is typically protected from public disclosure. Accordingly, the Company is providing both redacted and un-redacted versions of Attachment R-III-2-1, Attachment R-III-2-2, and Attachment R-III-4.

Therefore, the Company requests that, pursuant to Rule 1.3(H), the PUC afford confidential treatment to the confidential customer information contained in Attachment R-III-2-1 and Attachment R-III-2-2, and the confidential pricing information in Attachment R-III-4.

II. LEGAL STANDARD

Rule 1.3(H) of the PUC's Rules of Practice and Procedure provides that access to public records shall be granted in accordance with the Access to Public Records Act (APRA), R.I. Gen. Laws § 38-2-1, *et seq.* Under APRA, all documents and materials submitted in connection with the transaction of official business by an agency is deemed to be a "public record," unless the information contained in such documents and materials falls within one of the exceptions specifically identified in R.I. Gen. Laws § 38-2-2(4). To the extent that information provided to the PUC falls within one of the designated exceptions to the public records law, the PUC has the authority under the terms of APRA to deem such information as confidential and to protect that information from public disclosure.

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

In that regard, R.I. Gen. Laws § 38-2-2(4)(B) provides that the following types of records shall not be deemed public:

Trade secrets and commercial or financial information obtained from a person, firm, or corporation which is of a privileged or confidential nature.

The Rhode Island Supreme Court has held that this confidential information exemption applies where the disclosure of information would be likely either (1) to impair the government's ability to obtain necessary information in the future; or (2) to cause substantial harm to the competitive position of the person from whom the information was obtained. *Providence Journal Company v. Convention Center Authority*, 774 A.2d 40 (R.I. 2001).

The first prong of the test is satisfied when information is voluntarily provided to the governmental agency and that information is of a kind that would customarily not be released to the public by the person from whom it was obtained. *Providence Journal*, 774 A.2d at 47.

National Grid meets the first and second prongs of this test, which apply here.

In addition, R.I. Gen. Laws § 38-2-2(4)(A)(I)(b) provides that the following types of records shall not be deemed public:

Personnel and other personal individually-identifiable records otherwise deemed confidential by federal or state law or regulation, or the disclosure of which would constitute a clearly unwarranted invasion of personal privacy pursuant to 5 U.S.C. §552 *et seq*

See Providence Journal Co. v. Kane, 577 A.2d 661, 665 (R.I. 1990) (noting that the plaintiffs' request for information that will uniquely identify State employees by name, address, and employment history directly contravenes the clear proscription set forth in § 38-2-2 against disclosure of all records which are identifiable to an individual employee, including personnel records.). Although the Court in Kane addressed a request for personal employee information, the APRA clearly protects the personal customer information that National Grid seeks to protect

in Attachment DIV 4-4 because this information includes customers' project names and addresses.

III. BASIS FOR CONFIDENTIALITY

The information contained in Attachment R-III-2-1, Attachment R-III-2-2, and Attachment R-III-4 should be protected from public disclosure. The information provided in these attachments is confidential and privileged information of the type that National Grid does not ordinarily make public. Attachment R-III-2-1 and Attachment R-III-2-2 includes project sanctioning papers that contain customers' project names, addresses, and other identifying information. In addition, Attachment R-III-4 contains commercially sensitive cost estimates and other financial information related to the Company's distribution system and strategy.

With respect to customer-specific information, the Company is legally obligated to protect this type of information from public disclosure and the PUC has previously recognized the proprietary nature of this information. As such, the customers' project names and addresses contained in Attachment R-III-2-1 and Attachment R-III-2-2 satisfies the exception found in R.I. Gen. Laws. § 38-2-2(4)(A)(I)(b). In addition, public disclosure of the financial information contained in Attachment R-III-4 would put National Grid at a competitive disadvantage and negatively impact National Grid's ability to effectively operate to provide safe and reliable service to its customers. As such, this information is of a kind that National Grid would customarily not release to the public. Therefore, this information satisfies the exception found in R.I. Gen. Laws § 38-2-2(4)(B).

Accordingly, National Grid is providing Attachment R-III-2-1, Attachment R-III-2-2, and Attachment R-III-4 on a voluntary basis to assist the PUC with its decision-making in this

proceeding, but respectfully requests that the PUC provide confidential treatment to the information.

IV. CONCLUSION

For the foregoing reasons, National Grid respectfully requests that the PUC grant its Motion for Protective Treatment of Confidential Information.

Respectfully submitted,

**THE NARRAGANSETT ELECTRIC
COMPANY d/b/a NATIONAL GRID**
By its attorney,

A handwritten signature in blue ink, appearing to read "Jennifer Brooks Hutchinson", followed by a horizontal line.

Jennifer Brooks Hutchinson, Esq. (#6176)
National Grid
280 Melrose Street
Providence, RI 02907
(401) 784-7288
Dated: January 10, 2020

January 10, 2020

VIA HAND DELIVERY & ELECTRONIC MAIL

Rhode Island Division of Public Utilities and Carriers
c/o Luly E. Massaro
89 Jefferson Boulevard
Warwick, RI 02888

**RE: National Grid's Proposed FY 2021 Electric Infrastructure, Safety, and Reliability Plan
Responses to Division Data Requests – Set 3**

Dear Ms. Massaro:

I have enclosed National Grid's¹ responses to the Division's Third Set of Data Requests in the above-referenced matter.

Thank you for your attention to this transmittal. If you have any questions, please contact me at 401-784-7288.

Very truly yours,



Jennifer Brooks Hutchinson

Enclosure

cc: Leo Wold, Esq.
John Bell, Division
Greg Booth, Division
Linda Kushner, Division
Al Contente, Division

¹ The Narragansett Electric Company d/b/a National Grid (National Grid or the Company).

R-III-1

Request:

Provide a copy of the Company's daily reliability statistics for tree related interruptions compiled under the Vegetation Management program for FY 2015 - FY 2018, and MTD FY 2019 in executable format. For each fiscal year, provide summary statistical data for the top 10 worst performing days, comparing number of events, number of customer interruptions, and outage minutes to annual totals. Include relevant weather conditions for each of the top 10 worst performing days and a discussion of how the Company is using this data to develop targeted vegetation management activities.

Response:

Please see Attachment R-III-1 for daily reliability data.

The daily reliability data shows that a large percentage of the Company's tree events, customers interrupted, and customer minutes interrupted occur on just a handful of days. Most of these days reported some combination of rain/snow and wind. In addition to this, the Company also recognizes that it must do something to help customers experiencing large numbers of tree-related outages. These pockets of poor performance are typically further out near the end of a circuit and tree issues cannot be addressed by the typical cycle pruning or EHTM programs.

The cycle pruning program is designed to maintain an acceptable clearance between overhead conductors and vegetation to minimize the safety risk to the public and utility workforce. While cycle pruning does provide a modest reliability improvement, that is not its purpose, and it is not designed to address the issues we are seeing in some of these pockets of poor performance.

The EHTM program focuses on the removal of hazard trees on three-phase sections of circuits, which serve large numbers of customers, and have a history of tree-related reliability issues. Many of these pockets of poor performance are further out on single-phase portions of a circuit and do not meet the criteria to be included in our EHTM program.

The Company plans to take a more prescriptive approach in these areas by looking at each tree and determining the best plan for each one. This could mean removing the tree, removing all overhanging branches, or creating larger clearances than in our typical pruning specification. Once the tree issues in these pockets of poor performance have been addressed, the Company expects that these areas will experience improved reliability and can be maintained solely by routine cycle pruning in the future.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

Attachment R-III-1

The Company is also providing the Excel version of Attachment R-III-1

Daily reliability statistics for tree related interruptions

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2015	04/01/2014	1	5	360	486,707	0	0.00	72.00
FY 2015	04/07/2014	1	36	2,412	486,707	0	0.00	67.00
FY 2015	04/08/2014	1	11	6,578	486,707	0	0.01	598.00
FY 2015	04/09/2014	1	107	12,626	486,707	0	0.03	118.00
FY 2015	04/10/2014	1	2	128	486,707	0	0.00	64.00
FY 2015	04/14/2014	1	3	462	486,707	0	0.00	154.00
FY 2015	04/15/2014	17	910	180,815	486,707	0.002	0.37	198.70
FY 2015	04/16/2014	2	13	2,099	486,707	0	0.00	161.46
FY 2015	04/22/2014	1	49	5,684	486,707	0	0.01	116.00
FY 2015	04/23/2014	1	3	408	486,707	0	0.00	136.00
FY 2015	04/24/2014	3	1,478	146,150	486,707	0.003	0.30	98.88
FY 2015	04/27/2014	1	38	3,344	486,707	0	0.01	88.00
FY 2015	04/30/2014	2	14	1,940	486,707	0	0.00	138.57
FY 2015	05/01/2014	2	101	7,781	486,457	0	0.02	77.04
FY 2015	05/02/2014	1	8	1,096	486,457	0	0.00	137.00
FY 2015	05/04/2014	3	519	62,997	486,457	0.001	0.13	121.38
FY 2015	05/07/2014	1	49	931	486,457	0	0.00	19.00
FY 2015	05/13/2014	1	19	1,292	486,457	0	0.00	68.00
FY 2015	05/15/2014	1	39	3,636	486,457	0	0.01	93.23
FY 2015	05/17/2014	4	143	36,300	486,457	0	0.07	253.85
FY 2015	05/20/2014	1	153	17,595	486,457	0	0.04	115.00
FY 2015	05/24/2014	1	5	920	486,457	0	0.00	184.00
FY 2015	05/26/2014	1	2	108	486,457	0	0.00	54.00
FY 2015	05/27/2014	2	82	4,987	486,457	0	0.01	60.82
FY 2015	05/31/2014	2	6	470	486,457	0	0.00	78.33
FY 2015	06/04/2014	1	5	290	485,749	0	0.00	58.00
FY 2015	06/05/2014	3	61	5,694	485,749	0	0.01	93.34
FY 2015	06/06/2014	1	51	4,386	485,749	0	0.01	86.00
FY 2015	06/07/2014	3	18	4,247	485,749	0	0.01	235.94
FY 2015	06/08/2014	1	2	188	485,749	0	0.00	94.00
FY 2015	06/10/2014	4	92	10,446	485,749	0	0.02	113.54
FY 2015	06/11/2014	2	75	2,838	485,749	0	0.01	37.84
FY 2015	06/12/2014	2	9	697	485,749	0	0.00	77.44
FY 2015	06/13/2014	4	57	8,964	485,749	0	0.02	157.26
FY 2015	06/15/2014	2	37	17,994	485,749	0	0.04	486.32
FY 2015	06/16/2014	1	5	370	485,749	0	0.00	74.00
FY 2015	06/17/2014	1	54	3,942	485,749	0	0.01	73.00
FY 2015	06/18/2014	5	1,126	50,805	485,749	0.002	0.10	45.12
FY 2015	06/19/2014	2	8	1,540	485,749	0	0.00	192.50
FY 2015	06/20/2014	1	26	1,794	485,749	0	0.00	69.00
FY 2015	06/21/2014	2	3,320	17,918	485,749	0.007	0.04	5.40
FY 2015	06/24/2014	1	20	1,560	485,749	0	0.00	78.00
FY 2015	06/25/2014	1	2	276	485,749	0	0.00	138.00
FY 2015	06/26/2014	1	3	747	485,749	0	0.00	249.00
FY 2015	06/27/2014	1	8	1,656	485,749	0	0.00	207.00
FY 2015	06/28/2014	2	123	10,503	485,749	0	0.02	85.39
FY 2015	06/29/2014	1	203	7,308	485,749	0	0.02	36.00
FY 2015	06/30/2014	2	505	9,994	485,749	0.001	0.02	19.79
FY 2015	07/01/2014	1	11	495	484,715	0	0.00	45.00
FY 2015	07/02/2014	3	72	4,311	484,715	0	0.01	59.88
FY 2015	07/03/2014	2	15	1,255	484,715	0	0.00	83.67
FY 2015	07/04/2014	24	6,293	568,151	484,715	0.013	1.17	90.28
FY 2015	07/05/2014	8	1,713	54,332	484,715	0.004	0.11	31.72
FY 2015	07/06/2014	6	2,507	115,075	484,715	0.005	0.24	45.90
FY 2015	07/07/2014	1	11	814	484,715	0	0.00	74.00
FY 2015	07/08/2014	3	132	11,545	484,715	0	0.02	87.46
FY 2015	07/09/2014	3	74	3,804	484,715	0	0.01	51.41
FY 2015	07/10/2014	3	183	9,991	484,715	0	0.02	54.60
FY 2015	07/12/2014	1	41	4,469	484,715	0	0.01	109.00
FY 2015	07/13/2014	2	9	772	484,715	0	0.00	85.78
FY 2015	07/14/2014	4	110	14,102	484,715	0	0.03	128.20
FY 2015	07/15/2014	5	411	46,579	484,715	0.001	0.10	113.33
FY 2015	07/16/2014	6	119	12,345	484,715	0	0.03	103.74
FY 2015	07/22/2014	1	22	3,036	484,715	0	0.01	138.00
FY 2015	07/23/2014	1	402	6,879	484,715	0.001	0.01	17.11
FY 2015	07/24/2014	2	12	829	484,715	0	0.00	69.08
FY 2015	07/25/2014	1	15	4,785	484,715	0	0.01	319.00
FY 2015	07/26/2014	1	8	944	484,715	0	0.00	118.00
FY 2015	07/27/2014	2	8	1,144	484,715	0	0.00	143.00
FY 2015	07/29/2014	1	93	4,929	484,715	0	0.01	53.00
FY 2015	07/30/2014	1	24	3,312	484,715	0	0.01	138.00
FY 2015	08/01/2014	2	2,844	90,384	482,542	0.006	0.19	31.78
FY 2015	08/02/2014	3	824	102,858	482,542	0.002	0.21	124.83
FY 2015	08/06/2014	3	42	8,094	482,542	0	0.02	192.71
FY 2015	08/07/2014	1	2,400	89,954	482,542	0.005	0.19	37.48
FY 2015	08/08/2014	3	1,309	57,751	482,542	0.003	0.12	44.12
FY 2015	08/10/2014	2	91	10,127	482,542	0	0.02	111.29
FY 2015	08/11/2014	2	48	1,854	482,542	0	0.00	38.63
FY 2015	08/12/2014	2	211	14,107	482,542	0	0.03	66.86

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2015	08/13/2014	19	1,806	111,375	482,542	0.004	0.23	61.67
FY 2015	08/14/2014	4	1,601	80,914	482,542	0.003	0.17	50.54
FY 2015	08/15/2014	1	74	1,480	482,542	0	0.00	20.00
FY 2015	08/16/2014	1	7	861	482,542	0	0.00	123.00
FY 2015	08/21/2014	1	5	460	482,542	0	0.00	92.00
FY 2015	08/22/2014	2	126	21,415	482,542	0	0.04	169.96
FY 2015	08/24/2014	1	5	650	482,542	0	0.00	130.00
FY 2015	08/27/2014	4	210	43,447	482,542	0	0.09	206.89
FY 2015	08/28/2014	1	11	2,046	482,542	0	0.00	186.00
FY 2015	08/29/2014	2	134	30,155	482,542	0	0.06	225.04
FY 2015	08/31/2014	1	21	1,764	482,542	0	0.00	84.00
FY 2015	09/01/2014	2	52	4,732	484,236	0	0.01	91.00
FY 2015	09/02/2014	1	83	11,952	484,236	0	0.02	144.00
FY 2015	09/03/2014	2	67	7,859	484,236	0	0.02	117.30
FY 2015	09/05/2014	1	24	2,064	484,236	0	0.00	86.00
FY 2015	09/07/2014	2	52	4,848	484,236	0	0.01	93.23
FY 2015	09/09/2014	1	45	4,050	484,236	0	0.01	90.00
FY 2015	09/11/2014	1	31	1,829	484,236	0	0.00	59.00
FY 2015	09/13/2014	2	55	4,349	484,236	0	0.01	79.07
FY 2015	09/15/2014	1	3	549	484,236	0	0.00	183.00
FY 2015	09/17/2014	1	74	9,990	484,236	0	0.02	135.00
FY 2015	09/18/2014	1	4	352	484,236	0	0.00	88.00
FY 2015	09/19/2014	1	90	11,070	484,236	0	0.02	123.00
FY 2015	09/22/2014	1	154	14,476	484,236	0	0.03	94.00
FY 2015	09/23/2014	1	3	213	484,236	0	0.00	71.00
FY 2015	09/29/2014	1	10	120	484,236	0	0.00	12.00
FY 2015	10/01/2014	4	53	4,518	484,021	0	0.01	85.25
FY 2015	10/02/2014	4	162	12,812	484,021	0	0.03	79.09
FY 2015	10/04/2014	2	12	2,912	484,021	0	0.01	242.67
FY 2015	10/05/2014	1	27	1,863	484,021	0	0.00	69.00
FY 2015	10/06/2014	1	5	250	484,021	0	0.00	50.00
FY 2015	10/07/2014	2	74	6,998	484,021	0	0.01	94.57
FY 2015	10/12/2014	1	939	108,924	484,021	0.002	0.23	116.00
FY 2015	10/14/2014	2	48	4,900	484,021	0	0.01	102.08
FY 2015	10/16/2014	5	188	14,299	484,021	0	0.03	76.06
FY 2015	10/17/2014	2	50	8,087	484,021	0	0.02	161.74
FY 2015	10/18/2014	2	148	17,180	484,021	0	0.04	116.08
FY 2015	10/19/2014	1	3	375	484,021	0	0.00	125.00
FY 2015	10/21/2014	1	46	6,992	484,021	0	0.01	152.00
FY 2015	10/22/2014	45	9,052	1,247,336	484,021	0.019	2.58	137.80
FY 2015	10/23/2014	16	1,698	199,532	484,021	0.004	0.41	117.51
FY 2015	10/24/2014	2	25	2,860	484,021	0	0.01	114.40
FY 2015	10/25/2014	1	41	2,132	484,021	0	0.00	52.00
FY 2015	10/26/2014	5	905	153,910	484,021	0.002	0.32	170.07
FY 2015	10/30/2014	1	25	5,200	484,021	0	0.01	208.00
FY 2015	11/01/2014	2	10	1,476	484,155	0	0.00	147.60
FY 2015	11/02/2014	30	12,729	748,920	484,155	0.026	1.55	58.84
FY 2015	11/06/2014	2	10	793	484,155	0	0.00	79.30
FY 2015	11/07/2014	2	40	5,112	484,155	0	0.01	127.80
FY 2015	11/09/2014	1	41	4,141	484,155	0	0.01	101.00
FY 2015	11/16/2014	1	80	8,640	484,155	0	0.02	108.00
FY 2015	11/17/2014	5	128	14,257	484,155	0	0.03	111.38
FY 2015	11/20/2014	2	73	5,719	484,155	0	0.01	78.34
FY 2015	11/24/2014	3	103	4,091	484,155	0	0.01	39.72
FY 2015	11/26/2014	3	826	33,214	484,155	0.002	0.07	40.21
FY 2015	11/27/2014	3	1,316	105,238	484,155	0.003	0.22	79.97
FY 2015	12/02/2014	1	324	29,808	485,093	0.001	0.06	92.00
FY 2015	12/03/2014	3	183	14,043	485,093	0	0.03	76.74
FY 2015	12/04/2014	1	13	806	485,093	0	0.00	62.00
FY 2015	12/09/2014	3	129	9,656	485,093	0	0.02	74.85
FY 2015	12/10/2014	2	13	1,862	485,093	0	0.00	143.23
FY 2015	12/11/2014	2	36	8,388	485,093	0	0.02	233.00
FY 2015	12/17/2014	1	50	7,550	485,093	0	0.02	151.00
FY 2015	12/24/2014	3	141	10,308	485,093	0	0.02	73.11
FY 2015	12/25/2014	4	111	27,056	485,093	0	0.06	243.75
FY 2015	12/26/2014	1	5	860	485,093	0	0.00	172.00
FY 2015	12/29/2014	1	327	46,353	485,093	0.001	0.10	141.75
FY 2015	01/02/2015	1	54	6,264	484,120	0	0.01	116.00
FY 2015	01/05/2015	1	32	2,592	484,120	0	0.01	81.00
FY 2015	01/09/2015	1	3	840	484,120	0	0.00	280.00
FY 2015	01/12/2015	3	115	8,154	484,120	0	0.02	70.90
FY 2015	01/13/2015	1	6	84	484,120	0	0.00	14.00
FY 2015	01/18/2015	1	42	3,696	484,120	0	0.01	88.00
FY 2015	01/23/2015	1	9	99	484,120	0	0.00	11.00
FY 2015	01/24/2015	4	86	4,919	484,120	0	0.01	57.20
FY 2015	01/25/2015	1	734	49,912	484,120	0.002	0.10	68.00
FY 2015	01/26/2015	1	6	372	484,120	0	0.00	62.00
FY 2015	01/27/2015	9	938	288,102	484,120	0.002	0.60	307.14
FY 2015	02/05/2015	2	30	4,102	486,214	0	0.01	136.73
FY 2015	02/10/2015	1	76	8,436	486,214	0	0.02	111.00
FY 2015	02/15/2015	1	8	1,312	486,214	0	0.00	164.00

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2015	02/19/2015	1	37	444	486,214	0	0.00	12.00
FY 2015	02/21/2015	1	161	59,409	486,214	0	0.12	369.00
FY 2015	02/22/2015	1	131	11,266	486,214	0	0.02	86.00
FY 2015	03/01/2015	1	18	1,188	485,364	0	0.00	66.00
FY 2015	03/04/2015	2	213	37,131	485,364	0	0.08	174.32
FY 2015	03/05/2015	3	30	4,956	485,364	0	0.01	165.20
FY 2015	03/06/2015	1	7	553	485,364	0	0.00	79.00
FY 2015	03/14/2015	1	26	2,782	485,364	0	0.01	107.00
FY 2015	03/15/2015	1	70	11,900	485,364	0	0.02	170.00
FY 2015	03/17/2015	15	2,321	275,200	485,364	0.005	0.57	118.57
FY 2015	03/18/2015	22	1,434	463,155	485,364	0.003	0.95	322.98
FY 2015	03/19/2015	1	2	242	485,364	0	0.00	121.00
FY 2015	03/20/2015	1	2	150	485,364	0	0.00	75.00
FY 2015	03/25/2015	1	3	486	485,364	0	0.00	162.00
FY 2015	03/26/2015	5	245	22,726	485,364	0.001	0.05	92.76
FY 2015	03/28/2015	1	132	30,096	485,364	0	0.06	228.00
FY 2016	04/02/2015	1	3	744	481,716	0	0.00	248.00
FY 2016	04/03/2015	1	8	1,248	481,716	0	0.00	156.00
FY 2016	04/04/2015	19	4,658	315,812	481,716	0.01	0.66	67.80
FY 2016	04/07/2015	2	11	1,217	481,716	0	0.00	110.64
FY 2016	04/10/2015	2	10	864	481,716	0	0.00	86.40
FY 2016	04/11/2015	2	86	3,534	481,716	0	0.01	41.09
FY 2016	04/13/2015	1	28	11,816	481,716	0	0.02	422.00
FY 2016	04/17/2015	1	27	1,215	481,716	0	0.00	45.00
FY 2016	04/18/2015	1	1,035	35,190	481,716	0.002	0.07	34.00
FY 2016	04/20/2015	7	2,133	69,876	481,716	0.004	0.15	32.76
FY 2016	04/21/2015	1	6	900	481,716	0	0.00	150.00
FY 2016	04/22/2015	4	180	15,080	481,716	0	0.03	83.78
FY 2016	04/25/2015	1	2	106	481,716	0	0.00	53.00
FY 2016	04/26/2015	2	73	6,927	481,716	0	0.01	94.89
FY 2016	04/28/2015	1	12	288	481,716	0	0.00	24.00
FY 2016	05/04/2015	2	482	9,288	482,147	0.001	0.02	19.27
FY 2016	05/05/2015	1	50	4,550	482,147	0	0.01	91.00
FY 2016	05/11/2015	1	25	1,950	482,147	0	0.00	78.00
FY 2016	05/12/2015	2	1,136	49,403	482,147	0.002	0.10	43.49
FY 2016	05/13/2015	1	21	5,019	482,147	0	0.01	239.00
FY 2016	05/15/2015	1	50	2,550	482,147	0	0.01	51.00
FY 2016	05/17/2015	2	60	4,554	482,147	0	0.01	75.90
FY 2016	05/19/2015	2	30	3,365	482,147	0	0.01	112.17
FY 2016	05/20/2015	1	442	14,144	482,147	0.001	0.03	32.00
FY 2016	05/22/2015	2	80	16,105	482,147	0	0.03	201.31
FY 2016	05/26/2015	2	38	3,566	482,147	0	0.01	93.84
FY 2016	05/27/2015	2	73	4,051	482,147	0	0.01	55.49
FY 2016	05/29/2015	3	51	4,958	482,147	0	0.01	97.22
FY 2016	05/31/2015	7	246	22,352	482,147	0.001	0.05	90.86
FY 2016	06/01/2015	6	199	18,874	481,735	0	0.04	94.84
FY 2016	06/02/2015	1	274	3,288	481,735	0.001	0.01	12.00
FY 2016	06/03/2015	1	3	402	481,735	0	0.00	134.00
FY 2016	06/07/2015	2	111	12,180	481,735	0	0.03	109.73
FY 2016	06/08/2015	3	3,846	274,167	481,735	0.008	0.57	71.29
FY 2016	06/09/2015	2	61	9,857	481,735	0	0.02	161.59
FY 2016	06/10/2015	1	78	2,886	481,735	0	0.01	37.00
FY 2016	06/13/2015	2	76	28,106	481,735	0	0.06	369.82
FY 2016	06/15/2015	8	4,316	325,259	481,735	0.009	0.68	75.36
FY 2016	06/16/2015	1	55	4,180	481,735	0	0.01	76.00
FY 2016	06/17/2015	1	8	936	481,735	0	0.00	117.00
FY 2016	06/18/2015	1	7	329	481,735	0	0.00	47.00
FY 2016	06/19/2015	1	85	4,675	481,735	0	0.01	55.00
FY 2016	06/21/2015	6	277	54,176	481,735	0.001	0.11	195.58
FY 2016	06/23/2015	26	12,548	1,557,448	481,735	0.026	3.23	124.12
FY 2016	06/24/2015	2	22	3,428	481,735	0	0.01	155.82
FY 2016	06/26/2015	1	140	30,940	481,735	0	0.06	221.00
FY 2016	06/27/2015	1	49	6,468	481,735	0	0.01	132.00
FY 2016	06/28/2015	13	610	132,094	481,735	0.001	0.27	216.55
FY 2016	06/30/2015	1	729	15,309	481,735	0.002	0.03	21.00
FY 2016	07/01/2015	7	717	65,116	480,761	0.001	0.14	90.82
FY 2016	07/03/2015	1	12	1,764	480,761	0	0.00	147.00
FY 2016	07/05/2015	1	28	2,772	480,761	0	0.01	99.00
FY 2016	07/06/2015	1	118	9,204	480,761	0	0.02	78.00
FY 2016	07/07/2015	1	179	15,752	480,761	0	0.03	88.00
FY 2016	07/08/2015	5	277	10,187	480,761	0.001	0.02	36.78
FY 2016	07/09/2015	1	117	30,888	480,761	0	0.06	264.00
FY 2016	07/10/2015	3	243	19,575	480,761	0.001	0.04	80.56
FY 2016	07/11/2015	2	44	4,261	480,761	0	0.01	96.84
FY 2016	07/14/2015	3	21	1,953	480,761	0	0.00	93.00
FY 2016	07/15/2015	2	100	11,604	480,761	0	0.02	116.04
FY 2016	07/16/2015	3	1,262	100,904	480,761	0.003	0.21	79.96
FY 2016	07/17/2015	1	188	14,476	480,761	0	0.03	77.00
FY 2016	07/18/2015	1	16	1,232	480,761	0	0.00	77.00
FY 2016	07/20/2015	1	6	576	480,761	0	0.00	96.00
FY 2016	07/21/2015	2	99	9,473	480,761	0	0.02	95.69

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FY 2016	07/24/2015	5	229	37,160	480,761	0	0.08	162.27
FY 2016	07/25/2015	2	12	746	480,761	0	0.00	62.17
FY 2016	07/27/2015	4	235	56,616	480,761	0	0.12	240.92
FY 2016	07/28/2015	9	2,057	264,694	480,761	0.004	0.55	128.68
FY 2016	07/30/2015	1	2	216	480,761	0	0.00	108.00
FY 2016	07/31/2015	1	39	6,513	480,761	0	0.01	167.00
FY 2016	08/01/2015	1	29	4,495	484,898	0	0.01	155.00
FY 2016	08/02/2015	1	687	58,880	484,898	0.001	0.12	85.71
FY 2016	08/03/2015	1	7	686	484,898	0	0.00	98.00
FY 2016	08/05/2015	12	111	135,388	484,898	0	0.28	1,219.71
FY 2016	08/06/2015	11	80	32,599	484,898	0	0.07	407.49
FY 2016	08/07/2015	7	95	15,118	484,898	0	0.03	159.14
FY 2016	08/08/2015	1	19	4,579	484,898	0	0.01	241.00
FY 2016	08/09/2015	4	1,093	51,447	484,898	0.002	0.11	47.07
FY 2016	08/11/2015	22	1,759	127,447	484,898	0.004	0.26	72.45
FY 2016	08/12/2015	5	2,931	167,153	484,898	0.006	0.34	57.03
FY 2016	08/13/2015	2	21	1,722	484,898	0	0.00	82.00
FY 2016	08/14/2015	3	31	6,021	484,898	0	0.01	194.23
FY 2016	08/15/2015	2	521	83,860	484,898	0.001	0.17	160.96
FY 2016	08/16/2015	1	110	19,250	484,898	0	0.04	175.00
FY 2016	08/18/2015	1	2,254	118,567	484,898	0.005	0.24	52.60
FY 2016	08/19/2015	3	509	41,789	484,898	0.001	0.09	82.10
FY 2016	08/20/2015	2	99	14,573	484,898	0	0.03	147.20
FY 2016	08/21/2015	3	245	23,999	484,898	0.001	0.05	97.96
FY 2016	08/22/2015	2	86	10,217	484,898	0	0.02	118.80
FY 2016	08/23/2015	2	131	16,618	484,898	0	0.03	126.85
FY 2016	08/24/2015	3	48	10,788	484,898	0	0.02	224.75
FY 2016	08/25/2015	2	47	6,137	484,898	0	0.01	130.57
FY 2016	08/26/2015	1	52	208	484,898	0	0.00	4.00
FY 2016	08/28/2015	2	19	2,183	484,898	0	0.00	114.89
FY 2016	08/31/2015	1	4	324	484,898	0	0.00	81.00
FY 2016	09/01/2015	1	2	206	483,835	0	0.00	103.00
FY 2016	09/02/2015	3	432	32,504	483,835	0.001	0.07	75.24
FY 2016	09/03/2015	1	12	516	483,835	0	0.00	43.00
FY 2016	09/04/2015	4	380	35,785	483,835	0.001	0.07	94.17
FY 2016	09/05/2015	1	27	2,295	483,835	0	0.00	85.00
FY 2016	09/07/2015	1	3	336	483,835	0	0.00	112.00
FY 2016	09/08/2015	2	456	16,911	483,835	0.001	0.03	37.09
FY 2016	09/09/2015	2	66	23,277	483,835	0	0.05	352.68
FY 2016	09/10/2015	8	563	46,297	483,835	0.001	0.10	82.23
FY 2016	09/11/2015	5	570	83,447	483,835	0.001	0.17	146.40
FY 2016	09/13/2015	3	66	8,744	483,835	0	0.02	132.48
FY 2016	09/14/2015	2	894	55,116	483,835	0.002	0.11	61.65
FY 2016	09/21/2015	2	31	3,494	483,835	0	0.01	112.71
FY 2016	09/24/2015	1	25	3,476	483,835	0	0.01	139.04
FY 2016	09/30/2015	44	6,171	526,995	483,835	0.013	1.09	85.40
FY 2016	10/01/2015	3	98	17,361	483,809	0	0.04	177.15
FY 2016	10/02/2015	4	121	13,165	483,809	0	0.03	108.80
FY 2016	10/03/2015	10	725	83,275	483,809	0.001	0.17	114.86
FY 2016	10/04/2015	5	1,689	124,846	483,809	0.003	0.26	73.92
FY 2016	10/05/2015	1	43	4,902	483,809	0	0.01	114.00
FY 2016	10/06/2015	2	9	609	483,809	0	0.00	67.67
FY 2016	10/09/2015	6	915	76,870	483,809	0.002	0.16	84.01
FY 2016	10/10/2015	3	1,877	138,225	483,809	0.004	0.29	73.64
FY 2016	10/11/2015	1	44	3,124	483,809	0	0.01	71.00
FY 2016	10/13/2015	3	145	11,828	483,809	0	0.02	81.57
FY 2016	10/16/2015	1	3	819	483,809	0	0.00	273.00
FY 2016	10/17/2015	2	777	3,788	483,809	0.002	0.01	4.88
FY 2016	10/22/2015	1	2	392	483,809	0	0.00	196.00
FY 2016	10/23/2015	2	37	2,789	483,809	0	0.01	75.38
FY 2016	10/26/2015	1	37	2,849	483,809	0	0.01	77.00
FY 2016	10/28/2015	26	2,307	265,821	483,809	0.005	0.55	115.22
FY 2016	10/29/2015	27	8,582	1,043,300	483,809	0.018	2.16	121.57
FY 2016	10/30/2015	2	146	13,447	483,809	0	0.03	92.10
FY 2016	10/31/2015	2	6	598	483,809	0	0.00	99.67
FY 2016	11/01/2015	2	55	9,896	484,590	0	0.02	179.93
FY 2016	11/04/2015	2	38	5,746	484,590	0	0.01	151.21
FY 2016	11/06/2015	2	93	13,229	484,590	0	0.03	142.25
FY 2016	11/07/2015	1	5	520	484,590	0	0.00	104.00
FY 2016	11/11/2015	3	1,842	109,992	484,590	0.004	0.23	59.71
FY 2016	11/13/2015	2	207	25,394	484,590	0	0.05	122.68
FY 2016	11/14/2015	5	2,091	100,478	484,590	0.004	0.21	48.05
FY 2016	11/18/2015	2	16	1,042	484,590	0	0.00	65.13
FY 2016	11/19/2015	1	41	3,772	484,590	0	0.01	92.00
FY 2016	11/20/2015	8	403	43,311	484,590	0.001	0.09	107.47
FY 2016	12/01/2015	1	31	2,294	476,616	0	0.00	74.00
FY 2016	12/03/2015	3	195	24,310	476,616	0	0.05	124.67
FY 2016	12/14/2015	1	3	462	476,616	0	0.00	154.00
FY 2016	12/15/2015	4	83	6,858	476,616	0	0.01	82.63
FY 2016	12/17/2015	1	17	3,859	476,616	0	0.01	227.00
FY 2016	12/18/2015	1	3	270	476,616	0	0.00	90.00

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FY 2016	12/19/2015	1	15	1,860	476,616	0	0.00	124.00
FY 2016	12/22/2015	3	147	35,927	476,616	0	0.08	244.40
FY 2016	12/23/2015	1	3	303	476,616	0	0.00	101.00
FY 2016	12/24/2015	4	2,247	200,187	476,616	0.005	0.42	89.09
FY 2016	12/28/2015	1	25	2,175	476,616	0	0.00	87.00
FY 2016	12/29/2015	1	24	1,752	476,616	0	0.00	73.00
FY 2016	12/30/2015	1	2	56	476,616	0	0.00	28.00
FY 2016	01/04/2016	1	23	3,841	486,703	0	0.01	167.00
FY 2016	01/10/2016	10	1,999	155,525	486,703	0.004	0.32	77.80
FY 2016	01/11/2016	1	25	275	486,703	0	0.00	11.00
FY 2016	01/12/2016	2	2,784	351,026	486,703	0.006	0.72	126.09
FY 2016	01/13/2016	7	3,313	272,462	486,703	0.007	0.56	82.24
FY 2016	01/16/2016	2	108	15,552	486,703	0	0.03	144.00
FY 2016	01/17/2016	1	1,227	169,326	486,703	0.003	0.35	138.00
FY 2016	01/18/2016	1	18	2,574	486,703	0	0.01	143.00
FY 2016	01/19/2016	9	920	102,852	486,703	0.002	0.21	111.80
FY 2016	01/23/2016	11	788	108,459	486,703	0.002	0.22	137.64
FY 2016	01/24/2016	1	29	6,525	486,703	0	0.01	225.00
FY 2016	01/26/2016	1	3	297	486,703	0	0.00	99.00
FY 2016	01/29/2016	1	2	226	486,703	0	0.00	113.00
FY 2016	02/03/2016	5	85	13,577	486,792	0	0.03	159.73
FY 2016	02/04/2016	1	18	2,448	486,792	0	0.01	136.00
FY 2016	02/06/2016	32	778	669,295	486,792	0.002	1.37	860.28
FY 2016	02/07/2016	12	2,668	116,735	486,792	0.005	0.24	43.75
FY 2016	02/08/2016	17	681	111,391	486,792	0.001	0.23	163.57
FY 2016	02/09/2016	2	4	1,042	486,792	0	0.00	260.50
FY 2016	02/12/2016	1	8	680	486,792	0	0.00	85.00
FY 2016	02/13/2016	2	22	1,714	486,792	0	0.00	77.91
FY 2016	02/14/2016	2	37	5,516	486,792	0	0.01	149.08
FY 2016	02/15/2016	3	289	36,609	486,792	0.001	0.08	126.67
FY 2016	02/16/2016	44	6,017	820,885	486,792	0.012	1.69	136.43
FY 2016	02/17/2016	1	5	745	486,792	0	0.00	149.00
FY 2016	02/21/2016	1	202	9,696	486,792	0	0.02	48.00
FY 2016	02/23/2016	2	52	2,922	486,792	0	0.01	56.19
FY 2016	02/24/2016	6	126	19,498	486,792	0	0.04	154.75
FY 2016	02/26/2016	4	365	18,892	486,792	0.001	0.04	51.76
FY 2016	02/29/2016	2	21	1,050	486,792	0	0.00	50.00
FY 2016	03/02/2016	3	40	4,938	487,113	0	0.01	123.45
FY 2016	03/07/2016	1	4	216	487,113	0	0.00	54.00
FY 2016	03/09/2016	1	2	230	487,113	0	0.00	115.00
FY 2016	03/14/2016	1	488	14,152	487,113	0.001	0.03	29.00
FY 2016	03/15/2016	1	26	1,872	487,113	0	0.00	72.00
FY 2016	03/16/2016	1	27	1,701	487,113	0	0.00	63.00
FY 2016	03/17/2016	7	596	52,910	487,113	0.001	0.11	88.78
FY 2016	03/20/2016	1	54	20,736	487,113	0	0.04	384.00
FY 2016	03/21/2016	1	28	3,360	487,113	0	0.01	120.00
FY 2016	03/28/2016	1	52	4,056	487,113	0	0.01	78.00
FY 2016	03/29/2016	4	130	11,552	487,113	0	0.02	88.86
FY 2016	03/31/2016	30	5,658	599,411	487,113	0.012	1.23	105.94
FY 2017	04/01/2016	1	10	820	487,378	0	0.00	82.00
FY 2017	04/02/2016	1	536	18,224	487,378	0.001	0.04	34.00
FY 2017	04/03/2016	23	3,774	347,888	487,378	0.008	0.71	92.18
FY 2017	04/04/2016	2	102	7,914	487,378	0	0.02	77.59
FY 2017	04/07/2016	5	271	28,695	487,378	0.001	0.06	105.89
FY 2017	04/08/2016	2	180	24,021	487,378	0	0.05	133.45
FY 2017	04/11/2016	1	28	3,528	487,378	0	0.01	126.00
FY 2017	04/12/2016	1	70	2,940	487,378	0	0.01	42.00
FY 2017	04/15/2016	1	18	4,896	487,378	0	0.01	272.00
FY 2017	04/16/2016	2	66	5,970	487,378	0	0.01	90.45
FY 2017	04/19/2016	1	13	1,391	487,378	0	0.00	107.00
FY 2017	04/23/2016	1	12	780	487,378	0	0.00	65.00
FY 2017	05/01/2016	1	7	315	488,882	0	0.00	45.00
FY 2017	05/02/2016	1	2	520	488,882	0	0.00	260.00
FY 2017	05/03/2016	1	8	480	488,882	0	0.00	60.00
FY 2017	05/05/2016	2	15	1,212	488,882	0	0.00	80.80
FY 2017	05/07/2016	2	219	21,111	488,882	0	0.04	96.40
FY 2017	05/08/2016	2	396	41,740	488,882	0.001	0.09	105.40
FY 2017	05/09/2016	1	56	2,408	488,882	0	0.00	43.00
FY 2017	05/11/2016	2	21	3,321	488,882	0	0.01	158.14
FY 2017	05/15/2016	1	35	4,690	488,882	0	0.01	134.00
FY 2017	05/16/2016	2	738	56,112	488,882	0.002	0.11	76.03
FY 2017	05/17/2016	1	11	4,741	488,882	0	0.01	431.00
FY 2017	05/20/2016	1	7	805	488,882	0	0.00	115.00
FY 2017	05/22/2016	1	442	28,184	488,882	0.001	0.06	63.76
FY 2017	05/23/2016	1	22	2,464	488,882	0	0.01	112.00
FY 2017	05/26/2016	1	71	11,289	488,882	0	0.02	159.00
FY 2017	05/27/2016	1	246	17,958	488,882	0.001	0.04	73.00
FY 2017	05/28/2016	1	203	28,623	488,882	0	0.06	141.00
FY 2017	05/29/2016	2	221	8,483	488,882	0	0.02	38.38
FY 2017	05/31/2016	2	161	25,577	488,882	0	0.05	158.86
FY 2017	06/01/2016	2	91	5,464	488,432	0	0.01	60.04

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2017	06/02/2016	1	6	612	488,432	0	0.00	102.00
FY 2017	06/03/2016	1	81	7,493	488,432	0	0.02	92.51
FY 2017	06/04/2016	1	4	2,012	488,432	0	0.00	503.00
FY 2017	06/05/2016	3	105	11,268	488,432	0	0.02	107.31
FY 2017	06/06/2016	3	60	8,936	488,432	0	0.02	148.93
FY 2017	06/07/2016	2	848	54,247	488,432	0.002	0.11	63.97
FY 2017	06/08/2016	1	123	14,637	488,432	0	0.03	119.00
FY 2017	06/09/2016	4	443	39,072	488,432	0.001	0.08	88.20
FY 2017	06/10/2016	2	28	2,440	488,432	0	0.00	87.14
FY 2017	06/11/2016	2	139	1,108	488,432	0	0.00	7.97
FY 2017	06/12/2016	17	2,423	187,986	488,432	0.005	0.38	77.58
FY 2017	06/13/2016	3	168	12,677	488,432	0	0.03	75.46
FY 2017	06/15/2016	1	7	336	488,432	0	0.00	48.00
FY 2017	06/17/2016	1	5	375	488,432	0	0.00	75.00
FY 2017	06/18/2016	1	3	282	488,432	0	0.00	94.00
FY 2017	06/19/2016	1	62	6,820	488,432	0	0.01	110.00
FY 2017	06/20/2016	2	175	24,942	488,432	0	0.05	142.53
FY 2017	06/21/2016	3	233	36,623	488,432	0	0.07	157.18
FY 2017	06/22/2016	1	3	642	488,432	0	0.00	214.00
FY 2017	06/23/2016	1	3	333	488,432	0	0.00	111.00
FY 2017	06/24/2016	3	120	22,680	488,432	0	0.05	189.00
FY 2017	06/25/2016	3	7	1,696	488,432	0	0.00	242.29
FY 2017	06/26/2016	1	16	1,040	488,432	0	0.00	65.00
FY 2017	06/29/2016	2	60	3,128	488,432	0	0.01	52.13
FY 2017	06/30/2016	3	197	52,774	488,432	0	0.11	267.89
FY 2017	07/02/2016	2	68	21,077	487,981	0	0.04	309.96
FY 2017	07/03/2016	1	2	172	487,981	0	0.00	86.00
FY 2017	07/04/2016	2	140	5,228	487,981	0	0.01	37.34
FY 2017	07/05/2016	4	559	19,301	487,981	0.001	0.04	34.53
FY 2017	07/06/2016	1	31	7,936	487,981	0	0.02	256.00
FY 2017	07/07/2016	2	8	1,976	487,981	0	0.00	247.00
FY 2017	07/08/2016	1	77	4,851	487,981	0	0.01	63.00
FY 2017	07/10/2016	2	7	566	487,981	0	0.00	80.86
FY 2017	07/11/2016	1	59	5,959	487,981	0	0.01	101.00
FY 2017	07/12/2016	1	12	2,064	487,981	0	0.00	172.00
FY 2017	07/13/2016	2	1,387	80,345	487,981	0.003	0.16	57.93
FY 2017	07/14/2016	1	7	91	487,981	0	0.00	13.00
FY 2017	07/15/2016	4	302	40,961	487,981	0.001	0.08	135.63
FY 2017	07/16/2016	2	8	1,368	487,981	0	0.00	171.00
FY 2017	07/17/2016	3	69	10,698	487,981	0	0.02	155.04
FY 2017	07/18/2016	2	21	5,005	487,981	0	0.01	238.33
FY 2017	07/21/2016	2	35	9,924	487,981	0	0.02	283.54
FY 2017	07/23/2016	14	5,057	856,997	487,981	0.01	1.76	169.47
FY 2017	07/24/2016	4	182	15,967	487,981	0	0.03	87.73
FY 2017	07/25/2016	1	5	240	487,981	0	0.00	48.00
FY 2017	07/26/2016	3	1,032	36,994	487,981	0.002	0.08	35.85
FY 2017	07/28/2016	1	2	688	487,981	0	0.00	344.00
FY 2017	07/29/2016	7	194	22,117	487,981	0	0.05	114.01
FY 2017	07/30/2016	1	16	1,760	487,981	0	0.00	110.00
FY 2017	07/31/2016	2	12	1,956	487,981	0	0.00	163.00
FY 2017	08/01/2016	2	83	7,581	488,281	0	0.02	91.34
FY 2017	08/04/2016	1	1,226	77,496	488,281	0.003	0.16	63.21
FY 2017	08/07/2016	3	200	4,805	488,281	0	0.01	24.03
FY 2017	08/08/2016	3	82	9,421	488,281	0	0.02	114.89
FY 2017	08/10/2016	4	324	54,881	488,281	0.001	0.11	169.39
FY 2017	08/11/2016	2	1,254	79,172	488,281	0.003	0.16	63.14
FY 2017	08/12/2016	14	611	177,585	488,281	0.001	0.36	290.65
FY 2017	08/13/2016	8	1,795	260,455	488,281	0.004	0.53	145.10
FY 2017	08/14/2016	8	7,279	944,714	488,281	0.015	1.93	129.79
FY 2017	08/16/2016	3	204	18,525	488,281	0	0.04	90.81
FY 2017	08/17/2016	4	152	14,556	488,281	0	0.03	95.76
FY 2017	08/18/2016	1	77	17,325	488,281	0	0.04	225.00
FY 2017	08/19/2016	3	56	5,964	488,281	0	0.01	106.50
FY 2017	08/22/2016	5	458	53,858	488,281	0.001	0.11	117.59
FY 2017	08/23/2016	1	100	8,800	488,281	0	0.02	88.00
FY 2017	08/25/2016	2	81	9,926	488,281	0	0.02	122.54
FY 2017	08/26/2016	1	89	16,643	488,281	0	0.03	187.00
FY 2017	08/27/2016	2	413	80,071	488,281	0.001	0.16	193.88
FY 2017	08/28/2016	1	31	8,215	488,281	0	0.02	265.00
FY 2017	08/29/2016	1	32	9,024	488,281	0	0.02	282.00
FY 2017	08/30/2016	1	95	3,610	488,281	0	0.01	38.00
FY 2017	08/31/2016	1	2	1,140	488,281	0	0.00	570.00
FY 2017	09/03/2016	1	34	7,990	487,894	0	0.02	235.00
FY 2017	09/04/2016	2	187	17,006	487,894	0	0.03	90.94
FY 2017	09/07/2016	5	213	28,733	487,894	0	0.06	134.90
FY 2017	09/08/2016	2	908	30,252	487,894	0.002	0.06	33.32
FY 2017	09/09/2016	3	96	5,544	487,894	0	0.01	57.75
FY 2017	09/11/2016	4	1,418	85,215	487,894	0.003	0.17	60.10
FY 2017	09/12/2016	2	2,497	76,813	487,894	0.005	0.16	30.76
FY 2017	09/14/2016	1	179	6,623	487,894	0	0.01	37.00
FY 2017	09/15/2016	1	143	19,591	487,894	0	0.04	137.00

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2017	09/16/2016	2	806	26,253	487,894	0.002	0.05	32.57
FY 2017	09/17/2016	1	179	18,974	487,894	0	0.04	106.00
FY 2017	09/18/2016	1	13	2,210	487,894	0	0.00	170.00
FY 2017	09/19/2016	3	239	14,647	487,894	0	0.03	61.28
FY 2017	09/20/2016	2	110	20,136	487,894	0	0.04	183.05
FY 2017	09/22/2016	2	199	27,811	487,894	0	0.06	139.75
FY 2017	09/24/2016	1	4	428	487,894	0	0.00	107.00
FY 2017	09/25/2016	1	4	888	487,894	0	0.00	222.00
FY 2017	09/27/2016	3	138	29,163	487,894	0	0.06	211.33
FY 2017	09/28/2016	1	1,002	123,018	487,894	0.002	0.25	122.77
FY 2017	09/29/2016	3	396	32,548	487,894	0.001	0.07	82.19
FY 2017	09/30/2016	2	335	27,256	487,894	0.001	0.06	81.36
FY 2017	10/01/2016	6	4,499	310,518	488,389	0.009	0.64	69.02
FY 2017	10/02/2016	1	41	2,706	488,389	0	0.01	66.00
FY 2017	10/03/2016	1	17	5,474	488,389	0	0.01	322.00
FY 2017	10/04/2016	2	8	2,950	488,389	0	0.01	368.75
FY 2017	10/05/2016	1	24	1,704	488,389	0	0.00	71.00
FY 2017	10/09/2016	11	5,436	384,387	488,389	0.011	0.79	70.71
FY 2017	10/10/2016	2	15	1,741	488,389	0	0.00	116.07
FY 2017	10/11/2016	1	3	459	488,389	0	0.00	153.00
FY 2017	10/12/2016	1	10	1,250	488,389	0	0.00	125.00
FY 2017	10/18/2016	1	13	1,495	488,389	0	0.00	115.00
FY 2017	10/21/2016	1	62	5,642	488,389	0	0.01	91.00
FY 2017	10/22/2016	8	1,038	97,864	488,389	0.002	0.20	94.28
FY 2017	10/23/2016	9	1,514	67,480	488,389	0.003	0.14	44.57
FY 2017	10/25/2016	2	4	462	488,389	0	0.00	115.50
FY 2017	10/26/2016	1	8	512	488,389	0	0.00	64.00
FY 2017	10/27/2016	4	2,269	178,689	488,389	0.005	0.37	78.75
FY 2017	10/28/2016	2	135	13,010	488,389	0	0.03	96.37
FY 2017	10/30/2016	2	58	4,254	488,389	0	0.01	73.34
FY 2017	10/31/2016	1	112	7,952	488,389	0	0.02	71.00
FY 2017	11/01/2016	1	3	345	489,062	0	0.00	115.00
FY 2017	11/03/2016	1	14	3,304	489,062	0	0.01	236.00
FY 2017	11/05/2016	1	2,045	126,290	489,062	0.004	0.26	61.76
FY 2017	11/06/2016	2	113	11,960	489,062	0	0.02	105.84
FY 2017	11/11/2016	2	6	1,168	489,062	0	0.00	194.67
FY 2017	11/15/2016	1	49	4,018	489,062	0	0.01	82.00
FY 2017	11/16/2016	1	2	194	489,062	0	0.00	97.00
FY 2017	11/18/2016	2	123	10,158	489,062	0	0.02	82.59
FY 2017	11/19/2016	1	12	4,080	489,062	0	0.01	340.00
FY 2017	11/20/2016	3	74	10,744	489,062	0	0.02	145.19
FY 2017	11/21/2016	10	2,194	99,568	489,062	0.004	0.20	45.38
FY 2017	11/22/2016	2	172	20,774	489,062	0	0.04	120.78
FY 2017	11/26/2016	1	7	1,015	489,062	0	0.00	145.00
FY 2017	11/29/2016	3	49	5,769	489,062	0	0.01	117.73
FY 2017	11/30/2016	1	3	294	489,062	0	0.00	98.00
FY 2017	12/01/2016	3	485	32,010	489,988	0.001	0.07	66.00
FY 2017	12/07/2016	1	66	3,828	489,988	0	0.01	58.00
FY 2017	12/09/2016	1	75	4,275	489,988	0	0.01	57.00
FY 2017	12/10/2016	2	96	1,559	489,988	0	0.00	16.24
FY 2017	12/12/2016	1	5	295	489,988	0	0.00	59.00
FY 2017	12/14/2016	1	34	6,494	489,988	0	0.01	191.00
FY 2017	12/15/2016	14	3,360	296,062	489,988	0.007	0.60	88.11
FY 2017	12/16/2016	8	179	28,390	489,988	0	0.06	158.60
FY 2017	12/17/2016	2	137	9,670	489,988	0	0.02	70.58
FY 2017	12/18/2016	2	123	8,487	489,988	0	0.02	69.00
FY 2017	12/25/2016	1	264	25,143	489,988	0.001	0.05	95.24
FY 2017	12/27/2016	6	287	36,693	489,988	0.001	0.07	127.85
FY 2017	12/28/2016	1	2	106	489,988	0	0.00	53.00
FY 2017	12/29/2016	2	37	5,526	489,988	0	0.01	149.35
FY 2017	12/30/2016	2	42	1,446	489,988	0	0.00	34.43
FY 2017	12/31/2016	1	14	2,982	489,988	0	0.01	213.00
FY 2017	01/01/2017	2	20	1,138	491,047	0	0.00	56.90
FY 2017	01/02/2017	1	3	369	491,047	0	0.00	123.00
FY 2017	01/03/2017	1	12	2,244	491,047	0	0.00	187.00
FY 2017	01/04/2017	1	11	1,067	491,047	0	0.00	97.00
FY 2017	01/05/2017	1	37	370	491,047	0	0.00	10.00
FY 2017	01/11/2017	7	344	45,126	491,047	0.001	0.09	131.18
FY 2017	01/12/2017	4	426	26,818	491,047	0.001	0.05	62.95
FY 2017	01/18/2017	1	388	35,308	491,047	0.001	0.07	91.00
FY 2017	01/23/2017	12	951	100,057	491,047	0.002	0.20	105.21
FY 2017	01/24/2017	32	3,546	523,169	491,047	0.007	1.07	147.54
FY 2017	01/25/2017	4	191	10,644	491,047	0	0.02	55.73
FY 2017	01/26/2017	2	77	2,350	491,047	0	0.00	30.52
FY 2017	01/27/2017	1	11	1,056	491,047	0	0.00	96.00
FY 2017	02/05/2017	1	4	368	491,617	0	0.00	92.00
FY 2017	02/06/2017	1	18	1,692	491,617	0	0.00	94.00
FY 2017	02/08/2017	1	70	12,320	491,617	0	0.03	176.00
FY 2017	02/10/2017	9	189	24,700	491,617	0	0.05	130.69
FY 2017	02/11/2017	1	49	2,744	491,617	0	0.01	56.00
FY 2017	02/12/2017	3	189	18,067	491,617	0	0.04	95.59

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2017	02/13/2017	15	2,133	181,779	491,617	0.004	0.37	85.22
FY 2017	02/14/2017	2	33	3,024	491,617	0	0.01	91.64
FY 2017	02/22/2017	1	3	501	491,617	0	0.00	167.00
FY 2017	02/25/2017	2	111	36,957	491,617	0	0.08	332.95
FY 2017	02/26/2017	1	42	9,324	491,617	0	0.02	222.00
FY 2017	03/01/2017	3	163	8,914	491,958	0	0.02	54.69
FY 2017	03/02/2017	36	11,675	1,783,950	491,958	0.024	3.63	152.80
FY 2017	03/03/2017	3	693	17,551	491,958	0.001	0.04	25.33
FY 2017	03/04/2017	1	10	1,500	491,958	0	0.00	150.00
FY 2017	03/06/2017	1	3	390	491,958	0	0.00	130.00
FY 2017	03/07/2017	1	20	1,560	491,958	0	0.00	78.00
FY 2017	03/08/2017	3	18	3,106	491,958	0	0.01	172.56
FY 2017	03/09/2017	10	5,201	347,822	491,958	0.011	0.71	66.88
FY 2017	03/10/2017	2	135	27,982	491,958	0	0.06	207.27
FY 2017	03/11/2017	4	1,128	77,162	491,958	0.002	0.16	68.41
FY 2017	03/14/2017	19	3,659	517,502	491,958	0.007	1.05	141.43
FY 2017	03/15/2017	3	54	9,764	491,958	0	0.02	180.81
FY 2017	03/20/2017	1	816	88,680	491,958	0.002	0.18	108.68
FY 2017	03/21/2017	1	2	698	491,958	0	0.00	349.00
FY 2017	03/22/2017	3	11	1,261	491,958	0	0.00	114.64
FY 2017	03/27/2017	1	169	24,505	491,958	0	0.05	145.00
FY 2017	03/29/2017	1	23	2,231	491,958	0	0.00	97.00
FY 2018	04/01/2017	2	87	21,544	492,216	0	0.04	247.63
FY 2018	04/04/2017	1	3	369	492,216	0	0.00	123.00
FY 2018	04/06/2017	1	123	13,899	492,216	0	0.03	113.00
FY 2018	04/07/2017	2	17	2,069	492,216	0	0.00	121.71
FY 2018	04/08/2017	1	13	1,183	492,216	0	0.00	91.00
FY 2018	04/09/2017	1	13	598	492,216	0	0.00	46.00
FY 2018	04/15/2017	1	49	7,056	492,216	0	0.01	144.00
FY 2018	04/16/2017	1	1,760	87,800	492,216	0.004	0.18	49.89
FY 2018	04/17/2017	4	1,334	69,255	492,216	0.003	0.14	51.92
FY 2018	04/18/2017	2	24	1,744	492,216	0	0.00	72.67
FY 2018	04/19/2017	2	263	26,563	492,216	0.001	0.05	101.00
FY 2018	04/21/2017	1	16	912	492,216	0	0.00	57.00
FY 2018	04/23/2017	1	16	832	492,216	0	0.00	52.00
FY 2018	04/26/2017	3	248	14,935	492,216	0.001	0.03	60.22
FY 2018	04/27/2017	1	55	4,125	492,216	0	0.01	75.00
FY 2018	04/28/2017	1	66	4,422	492,216	0	0.01	67.00
FY 2018	04/30/2017	1	4	796	492,216	0	0.00	199.00
FY 2018	05/02/2017	2	279	19,984	491,841	0.001	0.04	71.63
FY 2018	05/03/2017	3	899	59,770	491,841	0.002	0.12	66.48
FY 2018	05/05/2017	2	84	8,771	491,841	0	0.02	104.42
FY 2018	05/06/2017	4	1,048	79,045	491,841	0.002	0.16	75.42
FY 2018	05/08/2017	1	6	1,524	491,841	0	0.00	254.00
FY 2018	05/11/2017	1	5	590	491,841	0	0.00	118.00
FY 2018	05/15/2017	1	3	396	491,841	0	0.00	132.00
FY 2018	05/17/2017	2	34	2,380	491,841	0	0.00	70.00
FY 2018	05/18/2017	2	16	1,488	491,841	0	0.00	93.00
FY 2018	05/19/2017	2	68	9,538	491,841	0	0.02	140.26
FY 2018	05/21/2017	1	7	315	491,841	0	0.00	45.00
FY 2018	05/22/2017	1	88	9,504	491,841	0	0.02	108.00
FY 2018	05/23/2017	3	53	4,588	491,841	0	0.01	86.57
FY 2018	05/25/2017	1	20	3,320	491,841	0	0.01	166.00
FY 2018	05/26/2017	2	34	3,363	491,841	0	0.01	98.91
FY 2018	05/27/2017	1	20	1,040	491,841	0	0.00	52.00
FY 2018	05/29/2017	2	339	26,166	491,841	0.001	0.05	77.19
FY 2018	05/31/2017	2	9	483	491,841	0	0.00	53.67
FY 2018	06/01/2017	1	5	235	488,916	0	0.00	47.00
FY 2018	06/05/2017	1	50	3,850	488,916	0	0.01	77.00
FY 2018	06/06/2017	7	3,198	146,733	488,916	0.007	0.30	45.88
FY 2018	06/07/2017	2	125	9,776	488,916	0	0.02	78.21
FY 2018	06/10/2017	1	19	3,097	488,916	0	0.01	163.00
FY 2018	06/11/2017	2	124	24,472	488,916	0	0.05	197.35
FY 2018	06/12/2017	3	400	26,383	488,916	0.001	0.05	65.96
FY 2018	06/13/2017	1	43	3,999	488,916	0	0.01	93.00
FY 2018	06/14/2017	2	44	6,924	488,916	0	0.01	157.36
FY 2018	06/16/2017	3	12	2,299	488,916	0	0.00	191.58
FY 2018	06/17/2017	2	50	17,789	488,916	0	0.04	355.78
FY 2018	06/18/2017	5	271	31,650	488,916	0.001	0.06	116.79
FY 2018	06/19/2017	4	2,196	73,035	488,916	0.004	0.15	33.26
FY 2018	06/20/2017	3	322	50,917	488,916	0.001	0.10	158.13
FY 2018	06/21/2017	2	1,501	73,493	488,916	0.003	0.15	48.96
FY 2018	06/23/2017	1	36	7,884	488,916	0	0.02	219.00
FY 2018	06/24/2017	4	257	21,801	488,916	0.001	0.04	84.83
FY 2018	06/26/2017	2	70	13,640	488,916	0	0.03	194.86
FY 2018	06/29/2017	2	82	4,180	488,916	0	0.01	50.98
FY 2018	06/30/2017	1	12	2,008	488,916	0	0.00	167.33
FY 2018	07/01/2017	1	28	1,792	487,800	0	0.00	64.00
FY 2018	07/02/2017	2	16	5,520	487,800	0	0.01	345.00
FY 2018	07/04/2017	1	97	5,529	487,800	0	0.01	57.00
FY 2018	07/05/2017	2	13	1,339	487,800	0	0.00	103.00

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2018	07/06/2017	1	544	65,824	487,800	0.001	0.13	121.00
FY 2018	07/07/2017	5	100	17,213	487,800	0	0.04	172.13
FY 2018	07/08/2017	2	89	14,100	487,800	0	0.03	158.43
FY 2018	07/10/2017	1	23	4,140	487,800	0	0.01	180.00
FY 2018	07/11/2017	1	41	3,936	487,800	0	0.01	96.00
FY 2018	07/12/2017	3	528	45,876	487,800	0.001	0.09	86.89
FY 2018	07/13/2017	2	54	3,845	487,800	0	0.01	71.20
FY 2018	07/14/2017	2	200	47,675	487,800	0	0.10	238.38
FY 2018	07/16/2017	1	7	910	487,800	0	0.00	130.00
FY 2018	07/17/2017	1	12	4,860	487,800	0	0.01	405.00
FY 2018	07/18/2017	4	27	4,320	487,800	0	0.01	160.00
FY 2018	07/19/2017	1	10	1,170	487,800	0	0.00	117.00
FY 2018	07/20/2017	3	56	9,936	487,800	0	0.02	177.43
FY 2018	07/21/2017	1	50	5,903	487,800	0	0.01	118.06
FY 2018	07/22/2017	1	24	4,104	487,800	0	0.01	171.00
FY 2018	07/23/2017	1	352	82,770	487,800	0.001	0.17	235.14
FY 2018	07/24/2017	5	169	19,055	487,800	0	0.04	112.75
FY 2018	07/25/2017	2	59	7,997	487,800	0	0.02	135.54
FY 2018	07/26/2017	1	29	2,059	487,800	0	0.00	71.00
FY 2018	07/27/2017	1	215	34,654	487,800	0	0.07	161.18
FY 2018	07/28/2017	1	182	23,478	487,800	0	0.05	129.00
FY 2018	07/29/2017	3	29	3,806	487,800	0	0.01	131.24
FY 2018	07/31/2017	1	11	1,595	487,800	0	0.00	145.00
FY 2018	08/01/2017	2	18	1,734	489,839	0	0.00	96.33
FY 2018	08/02/2017	10	890	138,571	489,839	0.002	0.28	155.70
FY 2018	08/03/2017	1	163	16,137	489,839	0	0.03	99.00
FY 2018	08/04/2017	2	60	15,368	489,839	0	0.03	256.13
FY 2018	08/05/2017	2	133	25,451	489,839	0	0.05	191.36
FY 2018	08/07/2017	1	10	1,320	489,839	0	0.00	132.00
FY 2018	08/08/2017	2	27	3,624	489,839	0	0.01	134.22
FY 2018	08/12/2017	2	82	16,150	489,839	0	0.03	196.95
FY 2018	08/13/2017	3	161	19,125	489,839	0	0.04	118.79
FY 2018	08/14/2017	1	7	714	489,839	0	0.00	102.00
FY 2018	08/16/2017	1	17	5,202	489,839	0	0.01	306.00
FY 2018	08/18/2017	10	790	94,685	489,839	0.002	0.19	119.85
FY 2018	08/19/2017	1	76	15,151	489,839	0	0.03	199.36
FY 2018	08/20/2017	2	252	8,892	489,839	0.001	0.02	35.29
FY 2018	08/21/2017	1	41	6,519	489,839	0	0.01	159.00
FY 2018	08/23/2017	1	5	605	489,839	0	0.00	121.00
FY 2018	08/24/2017	2	74	11,868	489,839	0	0.02	160.38
FY 2018	08/25/2017	2	26	2,858	489,839	0	0.01	109.92
FY 2018	08/29/2017	2	41	5,597	489,839	0	0.01	136.51
FY 2018	08/30/2017	7	354	12,663	489,839	0.001	0.03	35.77
FY 2018	09/01/2017	1	756	8,344	490,317	0.002	0.02	11.04
FY 2018	09/03/2017	5	530	26,248	490,317	0.001	0.05	49.52
FY 2018	09/05/2017	3	84	5,913	490,317	0	0.01	70.39
FY 2018	09/06/2017	10	509	88,319	490,317	0.001	0.18	173.51
FY 2018	09/07/2017	12	2,119	304,469	490,317	0.004	0.62	143.69
FY 2018	09/10/2017	2	3,633	142,929	490,317	0.007	0.29	39.34
FY 2018	09/15/2017	2	70	7,626	490,317	0	0.02	108.94
FY 2018	09/16/2017	1	52	3,016	490,317	0	0.01	58.00
FY 2018	09/17/2017	1	43	9,073	490,317	0	0.02	211.00
FY 2018	09/18/2017	1	4	288	490,317	0	0.00	72.00
FY 2018	09/19/2017	4	266	30,277	490,317	0.001	0.06	113.82
FY 2018	09/20/2017	23	1,738	147,633	490,317	0.004	0.30	84.94
FY 2018	09/21/2017	41	16,618	1,340,686	490,317	0.034	2.73	80.68
FY 2018	09/22/2017	35	4,666	411,547	490,317	0.01	0.84	88.20
FY 2018	09/23/2017	4	88	10,268	490,317	0	0.02	116.68
FY 2018	09/25/2017	2	95	1,589	490,317	0	0.00	16.73
FY 2018	09/28/2017	1	83	7,055	490,317	0	0.01	85.00
FY 2018	09/30/2017	2	134	10,917	490,317	0	0.02	81.47
FY 2018	10/03/2017	1	2	356	490,477	0	0.00	178.00
FY 2018	10/04/2017	1	3	729	490,477	0	0.00	243.00
FY 2018	10/05/2017	1	2	334	490,477	0	0.00	167.00
FY 2018	10/06/2017	1	48	9,504	490,477	0	0.02	198.00
FY 2018	10/08/2017	3	10	2,294	490,477	0	0.00	229.40
FY 2018	10/09/2017	7	719	86,895	490,477	0.001	0.18	120.86
FY 2018	10/10/2017	1	263	1,841	490,477	0.001	0.00	7.00
FY 2018	10/12/2017	3	63	3,056	490,477	0	0.01	48.51
FY 2018	10/14/2017	1	2	124	490,477	0	0.00	62.00
FY 2018	10/15/2017	1	15	480	490,477	0	0.00	32.00
FY 2018	10/16/2017	2	53	6,012	490,477	0	0.01	113.43
FY 2018	10/20/2017	1	16	1,280	490,477	0	0.00	80.00
FY 2018	10/22/2017	1	16	1,808	490,477	0	0.00	113.00
FY 2018	10/24/2017	22	6,262	228,092	490,477	0.013	0.47	36.42
FY 2018	10/25/2017	18	770	104,941	490,477	0.002	0.21	136.29
FY 2018	10/26/2017	11	146	18,635	490,477	0	0.04	127.64
FY 2018	10/27/2017	3	41	4,807	490,477	0	0.01	117.24
FY 2018	11/01/2017	20	579	195,194	490,696	0.001	0.40	337.12
FY 2018	11/02/2017	14	422	132,145	490,696	0.001	0.27	313.14
FY 2018	11/03/2017	10	625	47,040	490,696	0.001	0.10	75.26

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2018	11/04/2017	5	176	8,309	490,696	0	0.02	47.21
FY 2018	11/05/2017	2	35	7,355	490,696	0	0.01	210.14
FY 2018	11/06/2017	1	13	286	490,696	0	0.00	22.00
FY 2018	11/07/2017	4	244	7,199	490,696	0	0.01	29.50
FY 2018	11/08/2017	2	159	16,732	490,696	0	0.03	105.23
FY 2018	11/09/2017	2	33	6,995	490,696	0	0.01	211.97
FY 2018	11/10/2017	13	3,288	237,908	490,696	0.007	0.48	72.36
FY 2018	11/12/2017	1	72	8,712	490,696	0	0.02	121.00
FY 2018	11/13/2017	2	769	47,121	490,696	0.002	0.10	61.28
FY 2018	11/15/2017	2	164	12,025	490,696	0	0.02	73.32
FY 2018	11/16/2017	5	228	32,371	490,696	0	0.07	141.98
FY 2018	11/17/2017	1	12	3,108	490,696	0	0.01	259.00
FY 2018	11/18/2017	1	160	9,280	490,696	0	0.02	58.00
FY 2018	11/19/2017	12	1,173	128,397	490,696	0.002	0.26	109.46
FY 2018	11/20/2017	5	3,242	151,704	490,696	0.007	0.31	46.79
FY 2018	11/21/2017	3	256	20,159	490,696	0.001	0.04	78.75
FY 2018	11/22/2017	7	314	25,279	490,696	0.001	0.05	80.51
FY 2018	11/25/2017	4	162	35,606	490,696	0	0.07	219.79
FY 2018	11/26/2017	2	80	12,926	490,696	0	0.03	161.58
FY 2018	11/30/2017	1	9	1,593	490,696	0	0.00	177.00
FY 2018	12/05/2017	7	1,072	85,910	491,532	0.002	0.17	80.14
FY 2018	12/06/2017	3	25	4,490	491,532	0	0.01	179.60
FY 2018	12/09/2017	1	265	4,505	491,532	0.001	0.01	17.00
FY 2018	12/10/2017	1	645	31,074	491,532	0.001	0.06	48.18
FY 2018	12/13/2017	6	2,599	103,187	491,532	0.005	0.21	39.70
FY 2018	12/15/2017	1	166	5,810	491,532	0	0.01	35.00
FY 2018	12/20/2017	1	45	9,765	491,532	0	0.02	217.00
FY 2018	12/23/2017	7	256	24,491	491,532	0.001	0.05	95.67
FY 2018	12/24/2017	2	181	14,532	491,532	0	0.03	80.29
FY 2018	12/25/2017	2	91	18,160	491,532	0	0.04	199.56
FY 2018	12/28/2017	1	432	13,392	491,532	0.001	0.03	31.00
FY 2018	01/04/2018	16	1,282	113,985	492,249	0.003	0.23	88.91
FY 2018	01/05/2018	2	972	136,693	492,249	0.002	0.28	140.63
FY 2018	01/06/2018	1	12	1,068	492,249	0	0.00	89.00
FY 2018	01/12/2018	20	1,755	139,749	492,249	0.004	0.28	79.63
FY 2018	01/13/2018	16	1,968	207,254	492,249	0.004	0.42	105.31
FY 2018	01/16/2018	1	5	665	492,249	0	0.00	133.00
FY 2018	01/17/2018	1	6	1,956	492,249	0	0.00	326.00
FY 2018	01/23/2018	5	294	24,818	492,249	0.001	0.05	84.41
FY 2018	01/27/2018	1	115	7,306	492,249	0	0.01	63.53
FY 2018	01/28/2018	2	24	1,913	492,249	0	0.00	79.71
FY 2018	02/01/2018	1	5	340	492,761	0	0.00	68.00
FY 2018	02/02/2018	1	15	1,725	492,761	0	0.00	115.00
FY 2018	02/05/2018	1	6	300	492,761	0	0.00	50.00
FY 2018	02/08/2018	1	30	2,610	492,761	0	0.01	87.00
FY 2018	02/10/2018	1	4	268	492,761	0	0.00	67.00
FY 2018	02/11/2018	3	221	26,227	492,761	0	0.05	118.67
FY 2018	02/16/2018	1	3	297	492,761	0	0.00	99.00
FY 2018	02/17/2018	3	141	13,589	492,761	0	0.03	96.38
FY 2018	02/18/2018	32	3,217	287,122	492,761	0.007	0.58	89.25
FY 2018	02/20/2018	1	705	31,705	492,761	0.001	0.06	44.97
FY 2018	02/21/2018	1	45	3,735	492,761	0	0.01	83.00
FY 2018	02/24/2018	1	48	3,024	492,761	0	0.01	63.00
FY 2018	02/25/2018	1	17	731	492,761	0	0.00	43.00
FY 2018	02/27/2018	2	1,461	74,552	492,761	0.003	0.15	51.03
FY 2018	03/01/2018	1	5	1,590	493,314	0	0.00	318.00
FY 2018	03/04/2018	11	734	204,426	493,314	0.001	0.41	278.51
FY 2018	03/05/2018	21	295	73,831	493,314	0.001	0.15	250.27
FY 2018	03/06/2018	5	158	56,668	493,314	0	0.11	358.66
FY 2018	03/09/2018	9	327	25,017	493,314	0.001	0.05	76.50
FY 2018	03/10/2018	4	10	4,528	493,314	0	0.01	452.80
FY 2018	03/11/2018	2	122	11,283	493,314	0	0.02	92.48
FY 2018	03/12/2018	2	146	20,132	493,314	0	0.04	137.89
FY 2018	03/14/2018	13	1,488	237,778	493,314	0.003	0.48	159.80
FY 2018	03/15/2018	7	159	17,442	493,314	0	0.04	109.70
FY 2018	03/16/2018	4	1,127	111,806	493,314	0.002	0.23	99.21
FY 2018	03/17/2018	3	131	12,759	493,314	0	0.03	97.40
FY 2018	03/19/2018	2	36	1,351	493,314	0	0.00	37.53
FY 2018	03/21/2018	2	226	21,221	493,314	0	0.04	93.90
FY 2018	03/22/2018	2	28	2,373	493,314	0	0.00	84.75
FY 2018	03/24/2018	1	30	270	493,314	0	0.00	9.00
FY 2018	03/27/2018	1	14	1,470	493,314	0	0.00	105.00
FY 2018	03/29/2018	1	3	288	493,314	0	0.00	96.00
FY 2019	04/01/2018	1	146	7,884	489,988	0	0.02	54.00
FY 2019	04/03/2018	1	2	564	489,988	0	0.00	282.00
FY 2019	04/04/2018	4	117	11,651	489,988	0	0.02	99.58
FY 2019	04/05/2018	6	802	56,454	489,988	0.002	0.12	70.39
FY 2019	04/06/2018	1	8	568	489,988	0	0.00	71.00
FY 2019	04/08/2018	1	1,993	3,986	489,988	0.004	0.01	2.00
FY 2019	04/13/2018	1	66	10,626	489,988	0	0.02	161.00
FY 2019	04/15/2018	2	13	4,691	489,988	0	0.01	360.85

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2019	04/16/2018	22	16,395	951,002	489,988	0.033	1.94	58.01
FY 2019	04/17/2018	3	98	7,656	489,988	0	0.02	78.12
FY 2019	04/18/2018	1	144	1,728	489,988	0	0.00	12.00
FY 2019	04/19/2018	3	85	4,533	489,988	0	0.01	53.33
FY 2019	04/21/2018	1	615	128,140	489,988	0.001	0.26	208.36
FY 2019	04/26/2018	3	129	9,360	489,988	0	0.02	72.56
FY 2019	04/28/2018	1	64	9,664	489,988	0	0.02	151.00
FY 2019	04/29/2018	2	35	1,163	489,988	0	0.00	33.23
FY 2019	05/01/2018	1	9	5,652	488,080	0	0.01	628.00
FY 2019	05/02/2018	4	189	23,458	488,080	0	0.05	124.12
FY 2019	05/03/2018	2	21	4,303	488,080	0	0.01	204.90
FY 2019	05/05/2018	1	2	416	488,080	0	0.00	208.00
FY 2019	05/06/2018	1	5	1,175	488,080	0	0.00	235.00
FY 2019	05/07/2018	1	27	4,374	488,080	0	0.01	162.00
FY 2019	05/08/2018	1	25	725	488,080	0	0.00	29.00
FY 2019	05/10/2018	1	87	6,090	488,080	0	0.01	70.00
FY 2019	05/13/2018	1	2	212	488,080	0	0.00	106.00
FY 2019	05/15/2018	3	42	5,246	488,080	0	0.01	124.90
FY 2019	05/16/2018	1	6	1,122	488,080	0	0.00	187.00
FY 2019	05/17/2018	2	83	7,382	488,080	0	0.02	88.94
FY 2019	05/21/2018	1	109	17,004	488,080	0	0.03	156.00
FY 2019	05/22/2018	1	33	1,815	488,080	0	0.00	55.00
FY 2019	05/23/2018	2	2,801	171,444	488,080	0.006	0.35	61.21
FY 2019	05/25/2018	1	432	55,501	488,080	0.001	0.11	128.47
FY 2019	05/26/2018	3	413	72,257	488,080	0.001	0.15	174.96
FY 2019	05/27/2018	1	278	49,762	488,080	0.001	0.10	179.00
FY 2019	05/28/2018	2	437	26,266	488,080	0.001	0.05	60.11
FY 2019	05/29/2018	2	1,186	76,502	488,080	0.002	0.16	64.50
FY 2019	05/30/2018	2	185	31,380	488,080	0	0.06	169.62
FY 2019	05/31/2018	1	105	9,135	488,080	0	0.02	87.00
FY 2019	06/01/2018	2	22	5,150	487,845	0	0.01	234.09
FY 2019	06/02/2018	1	16	480	487,845	0	0.00	30.00
FY 2019	06/03/2018	1	2	80	487,845	0	0.00	40.00
FY 2019	06/04/2018	8	149	12,284	487,845	0	0.03	82.44
FY 2019	06/06/2018	1	450	49,623	487,845	0.001	0.10	110.27
FY 2019	06/09/2018	2	87	7,742	487,845	0	0.02	88.99
FY 2019	06/10/2018	2	1,044	163,152	487,845	0.002	0.33	156.28
FY 2019	06/12/2018	4	113	11,539	487,845	0	0.02	102.12
FY 2019	06/13/2018	2	78	5,322	487,845	0	0.01	68.23
FY 2019	06/14/2018	2	25	3,169	487,845	0	0.01	126.76
FY 2019	06/16/2018	1	3	1,158	487,845	0	0.00	386.00
FY 2019	06/17/2018	1	600	30,080	487,845	0.001	0.06	50.13
FY 2019	06/18/2018	5	315	36,061	487,845	0.001	0.07	114.48
FY 2019	06/19/2018	2	1,496	50,932	487,845	0.003	0.10	34.05
FY 2019	06/21/2018	1	23	1,403	487,845	0	0.00	61.00
FY 2019	06/24/2018	2	156	31,581	487,845	0	0.06	202.44
FY 2019	06/25/2018	6	1,515	114,710	487,845	0.003	0.24	75.72
FY 2019	06/26/2018	3	125	7,554	487,845	0	0.02	60.43
FY 2019	06/27/2018	2	7	568	487,845	0	0.00	81.14
FY 2019	06/28/2018	8	291	70,178	487,845	0.001	0.14	241.16
FY 2019	06/29/2018	3	225	47,190	487,845	0	0.10	209.73
FY 2019	06/30/2018	3	279	11,133	487,845	0.001	0.02	39.90
FY 2019	07/01/2018	4	656	68,191	489,498	0.001	0.14	103.95
FY 2019	07/02/2018	1	19	2,185	489,498	0	0.00	115.00
FY 2019	07/03/2018	3	64	14,449	489,498	0	0.03	225.77
FY 2019	07/04/2018	2	138	25,196	489,498	0	0.05	182.58
FY 2019	07/05/2018	1	22	1,210	489,498	0	0.00	55.00
FY 2019	07/06/2018	4	721	46,518	489,498	0.001	0.10	64.52
FY 2019	07/08/2018	2	54	10,163	489,498	0	0.02	188.20
FY 2019	07/09/2018	2	13	788	489,498	0	0.00	60.62
FY 2019	07/10/2018	1	5	465	489,498	0	0.00	93.00
FY 2019	07/11/2018	2	54	3,919	489,498	0	0.01	72.57
FY 2019	07/13/2018	1	7	833	489,498	0	0.00	119.00
FY 2019	07/14/2018	2	146	30,808	489,498	0	0.06	211.01
FY 2019	07/15/2018	2	306	20,204	489,498	0.001	0.04	66.03
FY 2019	07/16/2018	2	10	446	489,498	0	0.00	44.60
FY 2019	07/17/2018	9	2,606	143,990	489,498	0.005	0.29	55.25
FY 2019	07/18/2018	4	87	20,921	489,498	0	0.04	240.47
FY 2019	07/19/2018	2	111	8,498	489,498	0	0.02	76.56
FY 2019	07/20/2018	4	170	14,556	489,498	0	0.03	85.62
FY 2019	07/21/2018	2	140	20,945	489,498	0	0.04	149.61
FY 2019	07/22/2018	10	4,107	213,338	489,498	0.008	0.44	51.94
FY 2019	07/23/2018	2	81	2,936	489,498	0	0.01	36.25
FY 2019	07/24/2018	7	153	18,533	489,498	0	0.04	121.13
FY 2019	07/25/2018	2	84	16,714	489,498	0	0.03	198.98
FY 2019	07/26/2018	10	6,349	212,557	489,498	0.013	0.43	33.48
FY 2019	07/27/2018	2	20	1,796	489,498	0	0.00	89.80
FY 2019	07/28/2018	3	170	30,934	489,498	0	0.06	181.96
FY 2019	07/29/2018	2	180	43,036	489,498	0	0.09	239.09
FY 2019	07/30/2018	1	25	1,100	489,498	0	0.00	44.00
FY 2019	08/01/2018	1	82	9,430	493,951	0	0.02	115.00

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2019	08/02/2018	3	47	5,000	493,951	0	0.01	106.38
FY 2019	08/03/2018	4	109	16,668	493,951	0	0.03	152.92
FY 2019	08/04/2018	8	425	74,752	493,951	0.001	0.15	175.89
FY 2019	08/05/2018	4	624	89,698	493,951	0.001	0.18	143.75
FY 2019	08/06/2018	3	366	65,417	493,951	0.001	0.13	178.73
FY 2019	08/07/2018	2	84	18,754	493,951	0	0.04	223.26
FY 2019	08/08/2018	3	128	2,530	493,951	0	0.01	19.77
FY 2019	08/10/2018	1	41	1,558	493,951	0	0.00	38.00
FY 2019	08/11/2018	3	46	5,463	493,951	0	0.01	118.76
FY 2019	08/12/2018	2	30	1,872	493,951	0	0.00	62.40
FY 2019	08/13/2018	7	215	34,845	493,951	0	0.07	162.07
FY 2019	08/14/2018	8	1,267	60,117	493,951	0.003	0.12	47.45
FY 2019	08/15/2018	1	2	500	493,951	0	0.00	250.00
FY 2019	08/16/2018	1	41	4,141	493,951	0	0.01	101.00
FY 2019	08/17/2018	2	111	13,053	493,951	0	0.03	117.59
FY 2019	08/19/2018	3	61	2,371	493,951	0	0.00	38.87
FY 2019	08/22/2018	4	276	21,505	493,951	0.001	0.04	77.92
FY 2019	08/24/2018	3	100	12,832	493,951	0	0.03	128.32
FY 2019	08/27/2018	2	308	32,300	493,951	0.001	0.07	104.87
FY 2019	08/28/2018	4	103	15,545	493,951	0	0.03	150.92
FY 2019	08/29/2018	2	169	13,526	493,951	0	0.03	80.04
FY 2019	08/30/2018	1	3	630	493,951	0	0.00	210.00
FY 2019	09/01/2018	1	43	4,214	494,626	0	0.01	98.00
FY 2019	09/02/2018	1	154	18,634	494,626	0	0.04	121.00
FY 2019	09/05/2018	2	125	12,702	494,626	0	0.03	101.62
FY 2019	09/06/2018	13	4,578	282,177	494,626	0.009	0.57	61.64
FY 2019	09/07/2018	3	213	31,975	494,626	0	0.06	150.12
FY 2019	09/08/2018	1	195	22,243	494,626	0	0.04	114.07
FY 2019	09/09/2018	1	171	33,174	494,626	0	0.07	194.00
FY 2019	09/10/2018	4	167	18,725	494,626	0	0.04	112.13
FY 2019	09/11/2018	2	20	730	494,626	0	0.00	36.50
FY 2019	09/12/2018	11	5,089	203,226	494,626	0.01	0.41	39.93
FY 2019	09/13/2018	7	2,808	352,682	494,626	0.006	0.71	125.60
FY 2019	09/14/2018	3	413	41,993	494,626	0.001	0.08	101.68
FY 2019	09/16/2018	2	1,986	117,810	494,626	0.004	0.24	59.32
FY 2019	09/17/2018	2	68	15,766	494,626	0	0.03	231.85
FY 2019	09/18/2018	13	1,985	98,384	494,626	0.004	0.20	49.56
FY 2019	09/19/2018	3	653	80,743	494,626	0.001	0.16	123.65
FY 2019	09/20/2018	1	89	20,025	494,626	0	0.04	225.00
FY 2019	09/21/2018	1	29	667	494,626	0	0.00	23.00
FY 2019	09/22/2018	4	1,263	11,694	494,626	0.003	0.02	9.26
FY 2019	09/25/2018	11	508	66,252	494,626	0.001	0.13	130.42
FY 2019	09/26/2018	9	514	58,639	494,626	0.001	0.12	114.08
FY 2019	09/27/2018	8	455	43,287	494,626	0.001	0.09	95.14
FY 2019	09/28/2018	1	19	3,116	494,626	0	0.01	164.00
FY 2019	09/30/2018	1	20	2,740	494,626	0	0.01	137.00
FY 2019	10/02/2018	6	111	25,069	494,892	0	0.05	225.85
FY 2019	10/03/2018	3	118	13,328	494,892	0	0.03	112.95
FY 2019	10/04/2018	1	74	22,348	494,892	0	0.05	302.00
FY 2019	10/07/2018	1	46	9,066	494,892	0	0.02	197.09
FY 2019	10/10/2018	1	174	17,574	494,892	0	0.04	101.00
FY 2019	10/11/2018	4	244	18,672	494,892	0	0.04	76.52
FY 2019	10/12/2018	11	869	67,956	494,892	0.002	0.14	78.20
FY 2019	10/15/2018	7	557	86,037	494,892	0.001	0.17	154.46
FY 2019	10/16/2018	38	7,661	1,415,358	494,892	0.015	2.86	184.75
FY 2019	10/17/2018	7	378	40,973	494,892	0.001	0.08	108.39
FY 2019	10/18/2018	3	34	3,835	494,892	0	0.01	112.79
FY 2019	10/19/2018	1	6	906	494,892	0	0.00	151.00
FY 2019	10/20/2018	1	111	18,759	494,892	0	0.04	169.00
FY 2019	10/21/2018	4	67	6,654	494,892	0	0.01	99.31
FY 2019	10/23/2018	5	477	91,238	494,892	0.001	0.18	191.27
FY 2019	10/25/2018	2	79	10,047	494,892	0	0.02	127.18
FY 2019	10/27/2018	20	2,857	226,837	494,892	0.006	0.46	79.40
FY 2019	10/28/2018	2	104	13,791	494,892	0	0.03	132.61
FY 2019	10/29/2018	2	7	1,597	494,892	0	0.00	228.14
FY 2019	10/30/2018	1	25	525	494,892	0	0.00	21.00
FY 2019	10/31/2018	1	2	306	494,892	0	0.00	153.00
FY 2019	11/02/2018	12	2,761	107,070	495,368	0.006	0.22	38.78
FY 2019	11/03/2018	36	4,201	431,481	495,368	0.008	0.87	102.71
FY 2019	11/04/2018	1	12	1,026	495,368	0	0.00	85.50
FY 2019	11/05/2018	3	2,158	193,766	495,368	0.004	0.39	89.79
FY 2019	11/06/2018	5	241	35,234	495,368	0	0.07	146.20
FY 2019	11/07/2018	5	2,242	52,886	495,368	0.005	0.11	23.59
FY 2019	11/09/2018	1	7	476	495,368	0	0.00	68.00
FY 2019	11/10/2018	1	6	414	495,368	0	0.00	69.00
FY 2019	11/13/2018	4	91	6,889	495,368	0	0.01	75.70
FY 2019	11/14/2018	2	121	7,177	495,368	0	0.01	59.31
FY 2019	11/15/2018	6	3,421	242,707	495,368	0.007	0.49	70.95
FY 2019	11/16/2018	5	156	6,387	495,368	0	0.01	40.94
FY 2019	11/17/2018	1	12	540	495,368	0	0.00	45.00
FY 2019	11/20/2018	2	38	2,692	495,368	0	0.01	70.84

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2019	11/21/2018	2	6	604	495,368	0	0.00	100.67
FY 2019	11/22/2018	2	366	45,004	495,368	0.001	0.09	122.96
FY 2019	11/25/2018	4	277	24,966	495,368	0.001	0.05	90.13
FY 2019	11/26/2018	1	385	12,705	495,368	0.001	0.03	33.00
FY 2019	11/27/2018	2	27	3,285	495,368	0	0.01	121.67
FY 2019	12/02/2018	4	1,497	99,414	496,448	0.003	0.20	66.41
FY 2019	12/07/2018	1	1,058	58,190	496,448	0.002	0.12	55.00
FY 2019	12/12/2018	1	3	246	496,448	0	0.00	82.00
FY 2019	12/13/2018	1	8	304	496,448	0	0.00	38.00
FY 2019	12/18/2018	9	1,829	140,381	496,448	0.004	0.28	76.75
FY 2019	12/20/2018	1	2,369	23,690	496,448	0.005	0.05	10.00
FY 2019	12/21/2018	49	12,189	1,017,230	496,448	0.025	2.05	83.45
FY 2019	12/22/2018	13	5,811	183,625	496,448	0.012	0.37	31.60
FY 2019	12/23/2018	1	7	238	496,448	0	0.00	34.00
FY 2019	12/27/2018	1	2	228	496,448	0	0.00	114.00
FY 2019	12/28/2018	3	750	82,681	496,448	0.002	0.17	110.24
FY 2019	12/29/2018	2	657	39,213	496,448	0.001	0.08	59.68
FY 2019	01/01/2019	20	1,013	155,223	497,548	0.002	0.31	153.23
FY 2019	01/02/2019	1	90	7,020	497,548	0	0.01	78.00
FY 2019	01/06/2019	2	1,198	43,112	497,548	0.002	0.09	35.99
FY 2019	01/07/2019	1	2	368	497,548	0	0.00	184.00
FY 2019	01/09/2019	4	1,452	58,037	497,548	0.003	0.12	39.97
FY 2019	01/11/2019	2	37	1,793	497,548	0	0.00	48.46
FY 2019	01/18/2019	1	41	3,567	497,548	0	0.01	87.00
FY 2019	01/19/2019	1	3	675	497,548	0	0.00	225.00
FY 2019	01/20/2019	36	3,843	612,529	497,548	0.008	1.23	159.39
FY 2019	01/21/2019	2	58	6,799	497,548	0	0.01	117.22
FY 2019	01/22/2019	2	27	2,518	497,548	0	0.01	93.26
FY 2019	01/23/2019	1	3	822	497,548	0	0.00	274.00
FY 2019	01/24/2019	104	16,505	1,872,074	497,548	0.033	3.76	113.42
FY 2019	01/25/2019	8	217	14,524	497,548	0	0.03	66.93
FY 2019	01/27/2019	1	2	244	497,548	0	0.00	122.00
FY 2019	01/30/2019	7	597	46,620	497,548	0.001	0.09	78.09
FY 2019	01/31/2019	2	300	14,559	497,548	0.001	0.03	48.53
FY 2019	02/02/2019	2	26	1,060	497,253	0	0.00	40.77
FY 2019	02/03/2019	1	458	50,380	497,253	0.001	0.10	110.00
FY 2019	02/04/2019	1	36	3,204	497,253	0	0.01	89.00
FY 2019	02/05/2019	1	6	690	497,253	0	0.00	115.00
FY 2019	02/09/2019	6	114	19,890	497,253	0	0.04	174.47
FY 2019	02/10/2019	1	4	652	497,253	0	0.00	163.00
FY 2019	02/11/2019	1	26	4,160	497,253	0	0.01	160.00
FY 2019	02/12/2019	1	2	112	497,253	0	0.00	56.00
FY 2019	02/16/2019	1	6	300	497,253	0	0.00	50.00
FY 2019	02/21/2019	1	36	2,556	497,253	0	0.01	71.00
FY 2019	02/24/2019	2	40	7,514	497,253	0	0.02	187.85
FY 2019	02/26/2019	9	867	233,872	497,253	0.002	0.47	269.75
FY 2019	02/27/2019	2	19	1,283	497,253	0	0.00	67.53
FY 2019	02/28/2019	1	55	6,985	497,253	0	0.01	127.00
FY 2019	03/01/2019	1	328	2,952	496,808	0.001	0.01	9.00
FY 2019	03/04/2019	47	8,168	1,047,434	496,808	0.016	2.11	128.24
FY 2019	03/05/2019	1	63	6,426	496,808	0	0.01	102.00
FY 2019	03/06/2019	1	2	548	496,808	0	0.00	274.00
FY 2019	03/10/2019	5	528	31,183	496,808	0.001	0.06	59.06
FY 2019	03/13/2019	1	6	354	496,808	0	0.00	59.00
FY 2019	03/15/2019	2	97	5,004	496,808	0	0.01	51.59
FY 2019	03/16/2019	1	23	6,106	496,808	0	0.01	265.48
FY 2019	03/22/2019	4	500	121,535	496,808	0.001	0.24	243.07
FY 2019	03/23/2019	4	147	5,880	496,808	0	0.01	40.00
FY 2019	03/24/2019	1	35	14,210	496,808	0	0.03	406.00
FY 2019	03/26/2019	2	22	1,992	496,808	0	0.00	90.55
FY 2019	03/27/2019	1	8	168	496,808	0	0.00	21.00
FY 2019	03/28/2019	1	53	2,332	496,808	0	0.00	44.00
FY 2019	03/30/2019	1	101	13,736	496,808	0	0.03	136.00
FY 2019	03/31/2019	1	23	2,898	496,808	0	0.01	126.00
FY 2020	04/01/2019	1	38	2,318	497,766	0	0.00	61.00
FY 2020	04/03/2019	6	249	24,408	497,766	0.001	0.05	98.02
FY 2020	04/04/2019	2	36	4,230	497,766	0	0.01	117.50
FY 2020	04/06/2019	1	2	264	497,766	0	0.00	132.00
FY 2020	04/08/2019	2	20	890	497,766	0	0.00	44.50
FY 2020	04/10/2019	1	74	7,622	497,766	0	0.02	103.00
FY 2020	04/16/2019	1	5	880	497,766	0	0.00	176.00
FY 2020	04/17/2019	1	12	3,600	497,766	0	0.01	300.00
FY 2020	04/18/2019	2	97	16,380	497,766	0	0.03	168.87
FY 2020	04/19/2019	9	234	37,274	497,766	0	0.07	159.29
FY 2020	04/20/2019	3	203	18,629	497,766	0	0.04	91.77
FY 2020	04/21/2019	1	5	225	497,766	0	0.00	45.00
FY 2020	04/22/2019	4	46	7,128	497,766	0	0.01	154.96
FY 2020	04/23/2019	2	124	3,598	497,766	0	0.01	29.02
FY 2020	04/24/2019	1	706	9,884	497,766	0.001	0.02	14.00
FY 2020	04/26/2019	1	4	912	497,766	0	0.00	228.00
FY 2020	04/27/2019	2	65	12,576	497,766	0	0.03	193.48

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2020	04/29/2019	1	371	33,237	497,766	0.001	0.07	89.59
FY 2020	05/02/2019	1	139	29,746	498,082	0	0.06	214.00
FY 2020	05/03/2019	1	269	26,362	498,082	0.001	0.05	98.00
FY 2020	05/06/2019	1	3	114	498,082	0	0.00	38.00
FY 2020	05/09/2019	1	2	264	498,082	0	0.00	132.00
FY 2020	05/12/2019	3	139	7,852	498,082	0	0.02	56.49
FY 2020	05/13/2019	2	820	37,051	498,082	0.002	0.07	45.18
FY 2020	05/14/2019	1	9	2,907	498,082	0	0.01	323.00
FY 2020	05/15/2019	1	3	366	498,082	0	0.00	122.00
FY 2020	05/16/2019	1	6	552	498,082	0	0.00	92.00
FY 2020	05/20/2019	13	1,521	190,555	498,082	0.003	0.38	125.28
FY 2020	05/21/2019	4	2,752	101,953	498,082	0.006	0.20	37.05
FY 2020	05/23/2019	2	2,349	159,430	498,082	0.005	0.32	67.87
FY 2020	05/24/2019	11	4,809	305,856	498,082	0.01	0.61	63.60
FY 2020	05/26/2019	1	2	380	498,082	0	0.00	190.00
FY 2020	05/29/2019	2	29	4,098	498,082	0	0.01	141.31
FY 2020	05/30/2019	3	68	15,246	498,082	0	0.03	224.21
FY 2020	05/31/2019	1	3	423	498,082	0	0.00	141.00
FY 2020	06/01/2019	1	45	6,795	496,924	0	0.01	151.00
FY 2020	06/03/2019	1	96	6,432	496,924	0	0.01	67.00
FY 2020	06/04/2019	1	48	3,120	496,924	0	0.01	65.00
FY 2020	06/05/2019	1	4	1,016	496,924	0	0.00	254.00
FY 2020	06/06/2019	2	1,721	175,913	496,924	0.003	0.35	102.22
FY 2020	06/07/2019	2	10	1,220	496,924	0	0.00	122.00
FY 2020	06/08/2019	1	62	5,270	496,924	0	0.01	85.00
FY 2020	06/10/2019	4	11,095	272,547	496,924	0.022	0.55	24.56
FY 2020	06/11/2019	9	1,876	158,908	496,924	0.004	0.32	84.71
FY 2020	06/12/2019	3	15	1,992	496,924	0	0.00	132.80
FY 2020	06/13/2019	8	2,432	168,966	496,924	0.005	0.34	69.48
FY 2020	06/14/2019	4	74	5,414	496,924	0	0.01	73.16
FY 2020	06/15/2019	9	347	42,890	496,924	0.001	0.09	123.60
FY 2020	06/17/2019	2	430	58,382	496,924	0.001	0.12	135.77
FY 2020	06/18/2019	1	14	350	496,924	0	0.00	25.00
FY 2020	06/19/2019	3	537	94,651	496,924	0.001	0.19	176.26
FY 2020	06/20/2019	3	1,855	50,509	496,924	0.004	0.10	27.23
FY 2020	06/21/2019	6	301	41,871	496,924	0.001	0.08	139.11
FY 2020	06/22/2019	1	20	840	496,924	0	0.00	42.00
FY 2020	06/24/2019	2	250	18,824	496,924	0.001	0.04	75.30
FY 2020	06/25/2019	3	74	6,177	496,924	0	0.01	83.47
FY 2020	06/26/2019	1	6	1,668	496,924	0	0.00	278.00
FY 2020	06/27/2019	1	3	237	496,924	0	0.00	79.00
FY 2020	06/28/2019	2	21	5,433	496,924	0	0.01	258.71
FY 2020	06/29/2019	3	1,887	157,452	496,924	0.004	0.32	83.44
FY 2020	06/30/2019	10	2,395	181,318	496,924	0.005	0.36	75.71
FY 2020	07/01/2019	1	19	114	496,820	0	0.00	6.00
FY 2020	07/03/2019	1	8	1,824	496,820	0	0.00	228.00
FY 2020	07/04/2019	1	6	810	496,820	0	0.00	135.00
FY 2020	07/05/2019	1	3	366	496,820	0	0.00	122.00
FY 2020	07/06/2019	3	107	10,470	496,820	0	0.02	97.85
FY 2020	07/07/2019	1	25	2,995	496,820	0	0.01	119.80
FY 2020	07/08/2019	1	90	4,842	496,820	0	0.01	53.80
FY 2020	07/09/2019	1	40	9,880	496,820	0	0.02	247.00
FY 2020	07/10/2019	1	172	28,181	496,820	0	0.06	163.84
FY 2020	07/11/2019	1	20	1,500	496,820	0	0.00	75.00
FY 2020	07/12/2019	9	3,831	469,374	496,820	0.008	0.94	122.52
FY 2020	07/13/2019	3	198	34,778	496,820	0	0.07	175.65
FY 2020	07/14/2019	2	8,541	1,525,959	496,820	0.017	3.07	178.66
FY 2020	07/15/2019	1	17	5,185	496,820	0	0.01	305.00
FY 2020	07/16/2019	1	2	208	496,820	0	0.00	104.00
FY 2020	07/17/2019	9	1,254	169,013	496,820	0.003	0.34	134.78
FY 2020	07/18/2019	8	484	49,283	496,820	0.001	0.10	101.82
FY 2020	07/19/2019	2	121	6,614	496,820	0	0.01	54.66
FY 2020	07/21/2019	1	5	400	496,820	0	0.00	80.00
FY 2020	07/22/2019	7	3,878	407,840	496,820	0.008	0.82	105.17
FY 2020	07/23/2019	10	586	64,455	496,820	0.001	0.13	109.99
FY 2020	07/24/2019	1	58	6,438	496,820	0	0.01	111.00
FY 2020	07/25/2019	1	166	29,050	496,820	0	0.06	175.00
FY 2020	07/26/2019	1	69	10,872	496,820	0	0.02	157.57
FY 2020	07/27/2019	1	41	6,191	496,820	0	0.01	151.00
FY 2020	07/28/2019	1	59	13,175	496,820	0	0.03	223.31
FY 2020	07/29/2019	1	64	23,936	496,820	0	0.05	374.00
FY 2020	07/30/2019	1	24	864	496,820	0	0.00	36.00
FY 2020	07/31/2019	1	23	2,461	496,820	0	0.00	107.00
FY 2020	08/01/2019	1	16	1,184	496,725	0	0.00	74.00
FY 2020	08/02/2019	1	6	282	496,725	0	0.00	47.00
FY 2020	08/04/2019	2	78	11,744	496,725	0	0.02	150.56
FY 2020	08/05/2019	1	20	1,640	496,725	0	0.00	82.00
FY 2020	08/07/2019	2	2,737	185,745	496,725	0.006	0.37	67.86
FY 2020	08/08/2019	5	75	6,127	496,725	0	0.01	81.69
FY 2020	08/10/2019	2	35	13,747	496,725	0	0.03	392.77
FY 2020	08/11/2019	1	8	2,856	496,725	0	0.01	357.00

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2020	08/12/2019	2	70	19,316	496,725	0	0.04	275.94
FY 2020	08/13/2019	3	1,720	5,548	496,725	0.003	0.01	3.23
FY 2020	08/14/2019	2	222	28,435	496,725	0	0.06	128.09
FY 2020	08/15/2019	1	142	8,236	496,725	0	0.02	58.00
FY 2020	08/16/2019	1	10	670	496,725	0	0.00	67.00
FY 2020	08/17/2019	1	30	3,000	496,725	0	0.01	100.00
FY 2020	08/18/2019	4	290	43,647	496,725	0.001	0.09	150.51
FY 2020	08/19/2019	10	4,813	304,338	496,725	0.01	0.61	63.23
FY 2020	08/20/2019	1	26	1,534	496,725	0	0.00	59.00
FY 2020	08/21/2019	4	143	23,475	496,725	0	0.05	164.16
FY 2020	08/22/2019	9	522	35,190	496,725	0.001	0.07	67.41
FY 2020	08/23/2019	3	2,507	130,476	496,725	0.005	0.26	52.04
FY 2020	08/24/2019	1	385	5,005	496,725	0.001	0.01	13.00
FY 2020	08/25/2019	1	13	1,534	496,725	0	0.00	118.00
FY 2020	08/26/2019	3	143	15,086	496,725	0	0.03	105.50
FY 2020	08/28/2019	10	1,020	122,662	496,725	0.002	0.25	120.26
FY 2020	08/29/2019	9	735	57,160	496,725	0.001	0.12	77.77
FY 2020	08/30/2019	4	2,386	97,264	496,725	0.005	0.20	40.76
FY 2020	08/31/2019	1	5	140	496,725	0	0.00	28.00
FY 2020	09/02/2019	4	153	12,923	496,173	0	0.03	84.46
FY 2020	09/04/2019	2	10	1,038	496,173	0	0.00	103.80
FY 2020	09/06/2019	2	92	5,272	496,173	0	0.01	57.30
FY 2020	09/07/2019	10	524	42,525	496,173	0.001	0.09	81.15
FY 2020	09/10/2019	1	12	972	496,173	0	0.00	81.00
FY 2020	09/11/2019	3	29	2,712	496,173	0	0.01	93.52
FY 2020	09/12/2019	7	166	15,766	496,173	0	0.03	94.98
FY 2020	09/14/2019	3	154	20,225	496,173	0	0.04	131.33
FY 2020	09/15/2019	3	265	37,605	496,173	0.001	0.08	141.91
FY 2020	09/16/2019	1	2	346	496,173	0	0.00	173.00
FY 2020	09/19/2019	1	7	910	496,173	0	0.00	130.00
FY 2020	09/20/2019	1	363	98,283	496,173	0.001	0.20	270.75
FY 2020	09/24/2019	2	206	30,111	496,173	0	0.06	146.17
FY 2020	09/26/2019	3	40	2,026	496,173	0	0.00	50.65
FY 2020	09/27/2019	1	74	1,554	496,173	0	0.00	21.00
FY 2020	09/28/2019	1	6	540	496,173	0	0.00	90.00
FY 2020	09/29/2019	2	37	3,280	496,173	0	0.01	88.65
FY 2020	10/01/2019	2	34	10,184	495,840	0	0.02	299.53
FY 2020	10/02/2019	5	333	48,431	495,840	0.001	0.10	145.44
FY 2020	10/04/2019	4	25	3,305	495,840	0	0.01	132.20
FY 2020	10/05/2019	1	2	116	495,840	0	0.00	58.00
FY 2020	10/07/2019	11	2,006	157,223	495,840	0.004	0.32	78.38
FY 2020	10/09/2019	10	3,762	262,877	495,840	0.008	0.53	69.88
FY 2020	10/10/2019	17	5,768	398,949	495,840	0.012	0.80	69.17
FY 2020	10/11/2019	20	2,668	140,807	495,840	0.005	0.28	52.78
FY 2020	10/13/2019	1	3,455	261,906	495,840	0.007	0.53	75.80
FY 2020	10/15/2019	2	78	2,546	495,840	0	0.01	32.64
FY 2020	10/18/2019	5	114	74,765	495,840	0	0.15	655.83
FY 2020	10/19/2019	5	223	28,247	495,840	0	0.06	126.67
FY 2020	10/21/2019	2	144	11,631	495,840	0	0.02	80.77
FY 2020	10/22/2019	3	197	19,786	495,840	0	0.04	100.44
FY 2020	10/23/2019	5	152	19,034	495,840	0	0.04	125.22
FY 2020	10/24/2019	2	221	30,362	495,840	0	0.06	137.38
FY 2020	10/26/2019	1	41	2,665	495,840	0	0.01	65.00
FY 2020	10/27/2019	8	522	19,612	495,840	0.001	0.04	37.57
FY 2020	10/28/2019	1	5	705	495,840	0	0.00	141.00
FY 2020	10/29/2019	2	71	5,143	495,840	0	0.01	72.44
FY 2020	10/30/2019	1	1,320	100,947	495,840	0.003	0.20	76.48
FY 2020	11/02/2019	11	386	69,070	496,727	0.001	0.14	178.94
FY 2020	11/03/2019	1	3	555	496,727	0	0.00	185.00
FY 2020	11/04/2019	1	10	1,530	496,727	0	0.00	153.00
FY 2020	11/05/2019	4	45	2,390	496,727	0	0.00	53.11
FY 2020	11/06/2019	1	9	900	496,727	0	0.00	100.00
FY 2020	11/07/2019	1	7	1,127	496,727	0	0.00	161.00
FY 2020	11/08/2019	1	3	540	496,727	0	0.00	180.00
FY 2020	11/17/2019	1	17	969	496,727	0	0.00	57.00
FY 2020	11/18/2019	2	18	1,930	496,727	0	0.00	107.22
FY 2020	11/22/2019	3	1,536	68,316	496,727	0.003	0.14	44.48
FY 2020	11/23/2019	1	29	4,611	496,727	0	0.01	159.00
FY 2020	11/24/2019	10	1,070	76,026	496,727	0.002	0.15	71.05
FY 2020	11/27/2019	1	2	524	496,727	0	0.00	262.00
FY 2020	11/28/2019	5	2,024	121,831	496,727	0.004	0.25	60.19
FY 2020	11/29/2019	1	11	2,596	496,727	0	0.01	236.00
FY 2020	12/01/2019	2	44	2,141	496,861	0	0.00	48.66
FY 2020	12/02/2019	4	260	37,509	496,861	0.001	0.08	144.27
FY 2020	12/05/2019	1	31	1,798	496,861	0	0.00	58.00
FY 2020	12/09/2019	9	1,058	50,962	496,861	0.002	0.10	48.17
FY 2020	12/10/2019	2	87	8,078	496,861	0	0.02	92.85
FY 2020	12/11/2019	1	2	204	496,861	0	0.00	102.00
FY 2020	12/14/2019	7	1,610	63,896	496,861	0.003	0.13	39.69
FY 2020	12/17/2019	38	6,448	434,556	496,861	0.013	0.87	67.39
FY 2020	12/18/2019	7	2,666	135,151	496,861	0.005	0.27	50.69

Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)
FY 2020	12/19/2019	8	882	73,578	496,861	0.002	0.15	83.42
FY 2020	12/21/2019	1	59	2,419	496,861	0	0.00	41.00
FY 2020	12/24/2019	1	34	2,414	496,861	0	0.00	71.00
FY 2020	12/29/2019	1	236	10,856	496,861	0	0.02	46.00

Fiscal Year	Sum of Events	Sum of CustomersInterrupted	Sum of CustomerMinutes
FY 2015	513	71,566	6,477,262
FY 2016	777	116,108	11,693,273
FY 2017	648	104,383	10,632,796
FY 2018	798	97,413	8,216,182
FY 2019	1,017	170,807	14,808,839
FY 2020	613	120,768	9,600,330
Grand Total	4,366	681,045	61,428,682

Fiscal Year	Sum of Events	Sum of Customers Interrupted	Sum of Customer Minutes
FY 2015	513	71,566	6,477,262

Top 10 Worst Performing Days based on Events

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2015	10/22/2014	45	9,052	1,247,336	484,021	0.019	2.58	137.80	Heavy rain, mild winds (13-31 mph)
2	FY 2015	11/02/2014	30	12,729	748,920	484,155	0.026	1.55	58.84	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2015	07/04/2014	24	6,293	568,151	484,715	0.013	1.17	90.28	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2015	03/18/2015	22	1,434	463,155	485,364	0.003	0.95	322.98	Fair/light rain, mild winds (13-31 mph)
5	FY 2015	08/13/2014	19	1,806	111,375	482,542	0.004	0.23	61.67	Heavy/Moderate rain, mild winds (13-31 mph)
6	FY 2015	04/15/2014	17	910	180,815	486,707	0.002	0.37	198.70	Heavy/Moderate rain, mild winds (13-31 mph)
7	FY 2015	10/23/2014	16	1,698	199,532	484,021	0.004	0.41	117.51	Heavy/Moderate rain, mild winds (13-31 mph)
8	FY 2015	03/17/2015	15	2,321	275,200	485,364	0.005	0.57	118.57	Heavy/Moderate rain, mild winds (13-31 mph)
9	FY 2015	01/27/2015	9	938	288,102	484,120	0.002	0.60	307.14	Snow blizzard
10	FY 2015	07/05/2014	8	1,713	54,332	484,715	0.004	0.11	31.72	Fair, mild winds (13-31 mph)
Total			205	38,894	4,136,918		0.082	8.54	1445.21	

Top 10 Worst Performing Days based on Customers Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2015	11/02/2014	30	12,729	748,920	484,155	0.026	1.55	58.84	Heavy/Moderate rain, mild winds (13-31 mph)
2	FY 2015	10/22/2014	45	9,052	1,247,336	484,021	0.019	2.58	137.80	Heavy rain, mild winds (13-31 mph)
3	FY 2015	07/04/2014	24	6,293	568,151	484,715	0.013	1.17	90.28	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2015	06/21/2014	2	3,320	17,918	485,749	0.007	0.04	5.40	Fair, calm/light winds (0-12 mph)
5	FY 2015	08/01/2014	2	2,844	90,384	482,542	0.006	0.19	31.78	Fair/light rain, calm/light winds (0-12 mph)
6	FY 2015	07/06/2014	6	2507	115,075	484,715	0.005	0.24	45.90	Fair/light rain, calm/light winds (0-12 mph)
7	FY 2015	08/07/2014	1	2,400	89,954	482,542	0.005	0.19	37.48	Fair/heavy rain, calm/light winds (0-12 mph)
8	FY 2015	03/17/2015	15	2,321	275,200	485,364	0.005	0.57	118.57	Heavy/Moderate rain, mild winds (13-31 mph)
9	FY 2015	08/13/2014	19	1806	111,375	482,542	0.004	0.23	61.67	Heavy/Moderate rain, mild winds (13-31 mph)
10	FY 2015	07/05/2014	8	1,713	54,332	484,715	0.004	0.11	31.72	Fair, mild winds (13-31 mph)
Total			152	44,985	3,318,645		0.094	6.87	619.44	

Top 10 Worst Performing Days based on Customer Minutes Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2015	10/22/2014	45	9,052	1,247,336	484,021	0.019	2.58	137.80	Heavy rain, mild winds (13-31 mph)
2	FY 2015	11/02/2014	30	12,729	748,920	484,155	0.026	1.55	58.84	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2015	07/04/2014	24	6,293	568,151	484,715	0.013	1.17	90.28	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2015	03/18/2015	22	1,434	463,155	485,364	0.003	0.95	322.98	Fair/light rain, mild winds (13-31 mph)
5	FY 2015	01/27/2015	9	938	288,102	484,120	0.002	0.60	307.14	Snow blizzard
6	FY 2015	03/17/2015	15	2321	275,200	485,364	0.005	0.57	118.57	Heavy/Moderate rain, mild winds (13-31 mph)
7	FY 2015	10/23/2014	16	1,698	199,532	484,021	0.004	0.41	117.51	Heavy/Moderate rain, mild winds (13-31 mph)
8	FY 2015	04/15/2014	17	910	180,815	486,707	0.002	0.37	198.70	Heavy/Moderate rain, mild winds (13-31 mph)
9	FY 2015	10/26/2014	5	905	153,910	484,021	0.002	0.32	170.07	Fair, mild winds (13-31 mph)
10	FY 2015	04/24/2014	3	1,478	146,150	486,707	0.003	0.30	98.88	Fair, mild winds (13-31 mph)
Total			186	37,758	4,271,271		0.079	8.82	1620.77	

Fiscal Year	Sum of Events	Sum of Customers Interrupted	Sum of Customer Minutes
FY 2016	777	116,108	11,693,273

Top 10 Worst Performing Days based on Events

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2016	02/16/2016	44	6,017	820,885	486,792	0.012	1.69	136.43	Heavy/Moderate rain, mild winds (13-31 mph)
2	FY 2016	09/30/2015	44	6,171	526,995	483,835	0.013	1.09	85.40	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2016	02/06/2016	32	778	669,295	486,792	0.002	1.37	860.28	Snow, mild winds (13-31 mph)
4	FY 2016	03/31/2016	30	5,658	599,411	487,113	0.012	1.23	105.94	Fair/Light rain, Strong winds (32-54 mph)
5	FY 2016	10/29/2015	27	8,582	1,043,300	483,809	0.018	2.16	121.57	Heavy/Moderate rain, mild winds (13-31 mph)
6	FY 2016	06/23/2015	26	12,548	1,557,448	481,735	0.026	3.23	124.12	Heavy/Moderate rain, mild winds (13-31 mph)
7	FY 2016	10/28/2015	26	2,307	265,821	483,809	0.005	0.55	115.22	Heavy/Moderate rain, mild winds (13-31 mph)
8	FY 2016	08/11/2015	22	1,759	127,447	484,898	0.004	0.26	72.45	Heavy/Moderate rain, mild winds (13-31 mph)
9	FY 2016	04/04/2015	19	4,658	315,812	481,716	0.01	0.66	67.80	Moderate/light rain, mild winds (13-31 mph)
10	FY 2016	02/08/2016	17	681	111,391	486,792	0.001	0.23	163.57	Snow, mild winds (13-31 mph)
Total			287	49,159	6,037,805		0.103	12.47	1852.78	

Top 10 Worst Performing Days based on Customers Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2016	06/23/2015	26	12,548	1,557,448	481,735	0.026	3.23	124.12	Heavy/Moderate rain, mild winds (13-31 mph)
2	FY 2016	10/29/2015	27	8,582	1,043,300	483,809	0.018	2.16	121.57	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2016	09/30/2015	44	6,171	526,995	483,835	0.013	1.09	85.40	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2016	02/16/2016	44	6,017	820,885	486,792	0.012	1.69	136.43	Heavy/Moderate rain, mild winds (13-31 mph)
5	FY 2016	03/31/2016	30	5,658	599,411	487,113	0.012	1.23	105.94	Fair/Light rain, Strong winds (32-54 mph)
6	FY 2016	04/04/2015	19	4,658	315,812	481,716	0.01	0.66	67.80	Moderate/light rain, mild winds (13-31 mph)
7	FY 2016	06/15/2015	8	4,316	325,259	481,735	0.009	0.68	75.36	Moderate/light rain, calm/light winds (0-12 mph)
8	FY 2016	06/08/2015	3	3,846	274,167	481,735	0.008	0.57	71.29	Fair, mild winds (13-31 mph)
9	FY 2016	01/13/2016	7	3,313	272,462	486,703	0.007	0.56	82.24	Fair/Snow, mild winds (13-31 mph)
10	FY 2016	08/12/2015	5	2,931	167,153	484,898	0.006	0.34	57.03	Fair/Light rain, calm/light winds (0-12 mph)
Total			213	58,040	5,902,892		0.121	12.21	927.18	

Top 10 Worst Performing Days based on Customer Minutes Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2016	06/23/2015	26	12,548	1,557,448	481,735	0.026	3.23	124.12	Heavy/Moderate rain, mild winds (13-31 mph)
2	FY 2016	10/29/2015	27	8,582	1,043,300	483,809	0.018	2.16	121.57	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2016	02/16/2016	44	6,017	820,885	486,792	0.012	1.69	136.43	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2016	02/06/2016	32	778	669,295	486,792	0.002	1.37	860.28	Snow, mild winds (13-31 mph)
5	FY 2016	03/31/2016	30	5,658	599,411	487,113	0.012	1.23	105.94	Fair/Light rain, Strong winds (32-54 mph)
6	FY 2016	09/30/2015	44	6,171	526,995	483,835	0.013	1.09	85.40	Heavy/Moderate rain, mild winds (13-31 mph)
7	FY 2016	01/12/2016	2	2,784	351,026	486,703	0.006	0.72	126.09	Fair/Snow, mild winds (13-31 mph)
8	FY 2016	06/15/2015	8	4,316	325,259	481,735	0.009	0.68	75.36	Moderate/light rain, calm/light winds (0-12 mph)
9	FY 2016	04/04/2015	19	4,658	315,812	481,716	0.01	0.66	67.80	Moderate/light rain, mild winds (13-31 mph)
10	FY 2016	06/08/2015	3	3,846	274,167	481,735	0.008	0.57	71.29	Fair, mild winds (13-31 mph)
Total			235	55,358	6,483,598		0.116	13.40	1774.28	

Fiscal Year	Sum of Events	Sum of Customers Interrupted	Sum of Customer Minutes
FY 2017	648	104,383	10,632,796

Top 10 Worst Performing Days based on Events

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2017	03/02/2017	36	11,675	1,783,950	491,958	0.024	3.63	152.80	Fair, strong winds (32-54 mph)
2	FY 2017	01/24/2017	32	3,546	523,169	491,047	0.007	1.07	147.54	Heavy/Moderate rain, mild winds (13-31 mph)
3	FY 2017	04/03/2016	23	3,774	347,888	487,378	0.008	0.71	92.18	Snow, mild winds (13-31 mph)
4	FY 2017	03/14/2017	19	3,659	517,502	491,958	0.007	1.05	141.43	Snow, strong winds (32-54 mph)
5	FY 2017	06/12/2016	17	2,423	187,986	488,432	0.005	0.38	77.58	Fair, mild winds (13-31 mph)
6	FY 2017	02/13/2017	15	2,133	181,779	491,617	0.004	0.37	85.22	Fair/snow, mild winds (13-31 mph)
7	FY 2017	07/23/2016	14	5,057	856,997	487,981	0.01	1.76	169.47	Heavy/Moderate rain, mild winds (13-31 mph)
8	FY 2017	08/12/2016	14	611	177,585	488,281	0.001	0.36	290.65	Heavy/Moderate rain, mild winds (13-31 mph)
9	FY 2017	12/15/2016	14	3,360	296,062	489,988	0.007	0.60	88.11	Fair/snow, strong winds (32-54 mph)
10	FY 2017	01/23/2017	12	951	100,057	491,047	0.002	0.20	105.21	Moderate/light rain, mild winds (13-31 mph)
Total			196	37,189	4,972,975		0.075	10.13	1350.19	

Top 10 Worst Performing Days based on Customers Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2017	03/02/2017	36	11,675	1,783,950	491,958	0.024	3.63	152.80	Fair, strong winds (32-54 mph)
2	FY 2017	08/14/2016	8	7,279	944,714	488,281	0.015	1.93	129.79	Thunderstorms
3	FY 2017	10/09/2016	11	5,436	384,387	488,389	0.011	0.79	70.71	Moderate/light rain, mild winds (13-31 mph)
4	FY 2017	03/09/2017	10	5,201	347,822	491,958	0.011	0.71	66.88	Fair, mild winds (13-31 mph)
5	FY 2017	07/23/2016	14	5,057	856,997	487,981	0.01	1.76	169.47	Heavy/Moderate rain, mild winds (13-31 mph)
6	FY 2017	10/01/2016	6	4,499	310,518	488,389	0.009	0.64	69.02	Moderate/light rain, calm winds (0-12 mph)
7	FY 2017	04/03/2016	23	3,774	347,888	487,378	0.008	0.71	92.18	Snow, mild winds (13-31 mph)
8	FY 2017	03/14/2017	19	3,659	517,502	491,958	0.007	1.05	141.43	Snow, strong winds (32-54 mph)
9	FY 2017	01/24/2017	32	3,546	523,169	491,047	0.007	1.07	147.54	Heavy/Moderate rain, mild winds (13-31 mph)
10	FY 2017	12/15/2016	14	3,360	296,062	489,988	0.007	0.60	88.11	Fair/snow, strong winds (32-54 mph)
Total			173	53,486	6,313,009		0.109	12.89	1127.93	

Top 10 Worst Performing Days based on Customer Minutes Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2017	03/02/2017	36	11,675	1,783,950	491,958	0.024	3.63	152.80	Fair, strong winds (32-54 mph)
2	FY 2017	08/14/2016	8	7,279	944,714	488,281	0.015	1.93	129.79	Thunderstorms
3	FY 2017	07/23/2016	14	5,057	856,997	487,981	0.01	1.76	169.47	Heavy/Moderate rain, mild winds (13-31 mph)
4	FY 2017	01/24/2017	32	3,546	523,169	491,047	0.007	1.07	147.54	Heavy/Moderate rain, mild winds (13-31 mph)
5	FY 2017	03/14/2017	19	3,659	517,502	491,958	0.007	1.05	141.43	Snow, strong winds (32-54 mph)
6	FY 2017	10/09/2016	11	5,436	384,387	488,389	0.011	0.79	70.71	Moderate/light rain, mild winds (13-31 mph)
7	FY 2017	04/03/2016	23	3,774	347,888	487,378	0.008	0.71	92.18	Snow, mild winds (13-31 mph)
8	FY 2017	03/09/2017	10	5,201	347,822	491,958	0.011	0.71	66.88	Fair, mild winds (13-31 mph)
9	FY 2017	10/01/2016	6	4,499	310,518	488,389	0.009	0.64	69.02	Moderate/light rain, calm winds (0-12 mph)
10	FY 2017	12/15/2016	14	3,360	296,062	489,988	0.007	0.60	88.11	Fair/snow, strong winds (32-54 mph)
Total			173	53,486	6,313,009		0.109	12.89	1127.93	

Fiscal Year	Sum of Events	Sum of Customers Interrupted	Sum of Customer Minutes
FY 2018	798	97,413	8,216,182

Top 10 Worst Performing Days based on Events

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2018	09/21/2017	41	16,618	1,340,686	490,317	0.034	2.73	80.68	Moderate/light rain, mild winds (13-31 mph)
2	FY 2018	09/22/2017	35	4,666	411,547	490,317	0.01	0.84	88.20	Moderate/light rain, mild winds (13-31 mph)
3	FY 2018	02/18/2018	32	3,217	287,122	492,761	0.007	0.58	89.25	Snow, mild winds (13-31mph)
4	FY 2018	09/20/2017	23	1,738	147,633	490,317	0.004	0.30	84.94	Moderate/light rain, mild winds (13-31 mph)
5	FY 2018	10/24/2017	22	6,262	228,092	490,477	0.013	0.47	36.42	Fair, mild winds (13-31 mph)
6	FY 2018	03/05/2018	21	295	73,831	493,314	0.001	0.15	250.27	Fair/dry snow, mild winds (13-31 mph)
7	FY 2018	11/01/2017	20	579	195,194	490,696	0.001	0.40	337.12	Heavy rain, strong winds (32-54 mph)
8	FY 2018	01/12/2018	20	1,755	139,749	492,249	0.004	0.28	79.63	Heavy/moderate rain, mild winds (13-31 mph)
9	FY 2018	10/25/2017	18	770	104,941	490,477	0.002	0.21	136.29	Moderate/light rain, mild winds (13-31 mph)
10	FY 2018	01/04/2018	16	1,282	113,985	492,249	0.003	0.23	88.91	Snow, strong winds (32-54 mph)
Total			248	37,182	3,042,780		0.079	6.19	1271.71	

Top 10 Worst Performing Days based on Customers Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2018	09/21/2017	41	16,618	1,340,686	490,317	0.034	2.73	80.68	Moderate/light rain, mild winds (13-31 mph)
2	FY 2018	10/24/2017	22	6,262	228,092	490,477	0.013	0.47	36.42	Fair, mild winds (13-31 mph)
3	FY 2018	09/22/2017	35	4,666	411,547	490,317	0.01	0.84	88.20	Moderate/light rain, mild winds (13-31 mph)
4	FY 2018	09/10/2017	2	3,633	142,929	490,317	0.007	0.29	39.34	Fair, calm/light winds (0-12 mph)
5	FY 2018	11/10/2017	13	3,288	237,908	490,696	0.007	0.48	72.36	Fair, mild winds (13-31 mph)
6	FY 2018	11/20/2017	5	3,242	151,704	490,696	0.007	0.31	46.79	Fair, calm/light winds (0-12 mph)
7	FY 2018	02/18/2018	32	3,217	287,122	492,761	0.007	0.58	89.25	Snow, mild winds (13-31mph)
8	FY 2018	06/06/2017	7	3,198	146,733	488,916	0.007	0.30	45.88	Moderate/light rain, mild winds (13-31 mph)
9	FY 2018	12/13/2017	6	2,599	103,187	491,532	0.005	0.21	39.70	Fair, mild winds (13-31 mph)
10	FY 2018	06/19/2017	4	2,196	73,035	488,916	0.004	0.15	33.26	Fair, mild winds (13-31 mph)
Total			167	48,919	3,122,943		0.101	6.36	571.88	

Top 10 Worst Performing Days based on Customer Minutes Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2018	09/21/2017	41	16,618	1,340,686	490,317	0.034	2.73	80.68	Moderate/light rain, mild winds (13-31 mph)
2	FY 2018	09/22/2017	35	4,666	411,547	490,317	0.01	0.84	88.20	Moderate/light rain, mild winds (13-31 mph)
3	FY 2018	09/07/2017	12	2,119	304,469	490,317	0.004	0.62	143.69	Heavy/moderate rain, calm/light winds (0-12 mph)
4	FY 2018	02/18/2018	32	3,217	287,122	492,761	0.007	0.58	89.25	Snow, mild winds (13-31mph)
5	FY 2018	11/10/2017	13	3,288	237,908	490,696	0.007	0.48	72.36	Fair, mild winds (13-31 mph)
6	FY 2018	03/14/2018	13	1,488	237,778	493,314	0.003	0.48	159.80	Fair/dry snow, mild winds (13-31 mph)
7	FY 2018	10/24/2017	22	6,262	228,092	490,477	0.013	0.47	36.42	Fair, mild winds (13-31 mph)
8	FY 2018	01/13/2018	16	1,968	207,254	492,249	0.004	0.42	105.31	Moderate/light rain, mild winds (13-31 mph)
9	FY 2018	03/04/2018	11	734	204,426	493,314	0.001	0.41	278.51	Fair, mild winds (13-31 mph)
10	FY 2018	11/01/2017	20	579	195,194	490,696	0.001	0.40	337.12	Heavy rain, strong winds (32-54 mph)
Total			215	40,939	3,654,476		0.084	7.43	1391.34	

Fiscal Year	Sum of Events	Sum of Customers Interrupted	Sum of Customer Minutes
FY 2019	1,017	170,807	14,808,839

Top 10 Worst Performing Days based on Events

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2019	01/24/2019	104	16,505	1,872,074	497,548	0.033	3.76	113.42	Heavy rain, Strong winds (32-54 mph)
2	FY 2019	12/21/2018	49	12,189	1,017,230	496,448	0.025	2.05	83.45	Heavy/moderate rain, mild winds (13-31 mph)
3	FY 2019	03/04/2019	47	8,168	1,047,434	496,808	0.016	2.11	128.24	Snow, mild winds (13-31 mph)
4	FY 2019	10/16/2018	38	7,661	1,415,358	494,892	0.015	2.86	184.75	Moderate/light rain, mild winds (13-31 mph)
5	FY 2019	11/03/2018	36	4,201	431,481	495,368	0.008	0.87	102.71	Moderate rain, mild winds (13-31 mph)
6	FY 2019	01/20/2019	36	3,843	612,529	497,548	0.008	1.23	159.39	Heavy rain/ice, mild winds (13-31 mph)
7	FY 2019	04/16/2018	22	16,395	951,002	489,988	0.033	1.94	58.01	Heavy/moderate rain, mild winds (13-31 mph)
8	FY 2019	10/27/2018	20	2,857	226,837	494,892	0.006	0.46	79.40	Moderate/light rain, mild winds (13-31 mph)
9	FY 2019	01/01/2019	20	1,013	155,223	497,548	0.002	0.31	153.23	Fair, strong winds (32-54 mph)
10	FY 2019	09/06/2018	13	4,578	282,177	494,626	0.009	0.57	61.64	Heavy/moderate rain, mild winds (13-31 mph)
Total			385	77,410	8,011,345		0.155	16.16	1124.24	

Top 10 Worst Performing Days based on Customers Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2019	01/24/2019	104	16,505	1,872,074	497,548	0.033	3.76	113.42	Heavy rain, Strong winds (32-54 mph)
2	FY 2019	04/16/2018	22	16,395	951,002	489,988	0.033	1.94	58.01	Heavy/moderate rain, mild winds (13-31 mph)
3	FY 2019	12/21/2018	49	12,189	1,017,230	496,448	0.025	2.05	83.45	Heavy/moderate rain, mild winds (13-31 mph)
4	FY 2019	03/04/2019	47	8,168	1,047,434	496,808	0.016	2.11	128.24	Snow, mild winds (13-31 mph)
5	FY 2019	10/16/2018	38	7,661	1,415,358	494,892	0.015	2.86	184.75	Moderate/light rain, mild winds (13-31 mph)
6	FY 2019	07/26/2018	10	6,349	212,557	489,498	0.013	0.43	33.48	Moderate/light rain, calm/light winds (0-12 mph)
7	FY 2019	12/22/2018	13	5,811	183,625	496,448	0.012	0.37	31.60	Fair, mild winds (13-31 mph)
8	FY 2019	09/12/2018	11	5,089	203,226	494,626	0.01	0.41	39.93	Moderate/light rain, calm/light winds (0-12 mph)
9	FY 2019	09/06/2018	13	4,578	282,177	494,626	0.009	0.57	61.64	Heavy/moderate rain, mild winds (13-31 mph)
10	FY 2019	11/03/2018	36	4,201	431,481	495,368	0.008	0.87	102.71	Moderate rain, mild winds (13-31 mph)
Total			343	86,946	7,616,164		0.174	15.37	837.23	

Top 10 Worst Performing Days based on Customer Minutes Interrupted

#	Fiscal Year	Date	Events	Customers Interrupted	Customer Minutes	Customers Served	SAIFI	SAIDI (min)	CAIDI (min)	Weather conditions
1	FY 2019	01/24/2019	104	16,505	1,872,074	497,548	0.033	3.76	113.42	Heavy rain, Strong winds (32-54 mph)
2	FY 2019	10/16/2018	38	7,661	1,415,358	494,892	0.015	2.86	184.75	Moderate/light rain, mild winds (13-31 mph)
3	FY 2019	03/04/2019	47	8,168	1,047,434	496,808	0.016	2.11	128.24	Snow, mild winds (13-31 mph)
4	FY 2019	12/21/2018	49	12,189	1,017,230	496,448	0.025	2.05	83.45	Heavy/moderate rain, mild winds (13-31 mph)
5	FY 2019	04/16/2018	22	16,395	951,002	489,988	0.033	1.94	58.01	Heavy/moderate rain, mild winds (13-31 mph)
6	FY 2019	01/20/2019	36	3,843	612,529	497,548	0.008	1.23	159.39	Heavy rain/ice, mild winds (13-31 mph)
7	FY 2019	11/03/2018	36	4,201	431,481	495,368	0.008	0.87	102.71	Moderate rain, mild winds (13-31 mph)
8	FY 2019	09/13/2018	7	2,808	352,682	494,626	0.006	0.71	125.60	Moderate/light rain, calm/light winds (0-12 mph)
9	FY 2019	09/06/2018	13	4,578	282,177	494,626	0.009	0.57	61.64	Heavy/moderate rain, mild winds (13-31 mph)
10	FY 2019	11/15/2018	6	3,421	242,707	495,368	0.007	0.49	70.95	Snow, calm/light winds (0-12 mph)
Total			358	79,769	8,224,674		0.160	16.59	1088.16	

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

R-III-2

Request:

Provide all Franklin Square Breaker project sanction papers (C081006 for 26 breakers and C068686 for 11 breakers).

Response:

See Attachment R-III-2-1 for the sanction paper for project C081006, and Attachment R-III-2-2 for the sanction paper for project C068686. Both sanction papers contain confidential customer information. Accordingly, the Company is providing redacted versions of those sanction papers for the public filing, together with a Motion for Protective Treatment.

This document has been redacted for Confidential Information.



Short Form Sanction Paper

Title:	Franklin Square Circuit Breaker Replacement	Sanction Paper #:	USSC-18-331
Project #:	C081006	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	11/27/2018
Author:	Robert Pendrake	Sponsor:	Carol A. Sedewitz, VP Distribution Asset Management & Planning
Utility Service:	Electricity T&D	Project Manager:	Banafsheh Tofigh

1 Executive Summary

1.1 **Sanctioning Summary**

This paper requests sanction of C081006 in the amount of \$4.550M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$4.550M broken down into:

\$4.316M Capex

\$0.000M Opex

\$0.234M Removal

This project has undergone a Capital Efficiency Review with the following determination:

This project reflects mature designs and efficiencies that are now accepted as a standard. The sanction amount reflects these efficiency savings; however, there are no further incremental savings relative to the sanction amount.

1.2 **Project Summary**

The project will replace twenty-six (26) circuit breakers at the Franklin Square #11 substation in Providence due to asset condition. The breakers are obsolete (1938 vintage), lack spare parts, are slow to operate and are unreliable. Additionally, replacement of these breakers is necessary to support ongoing expansion and system improvement work in the area.

Short Form Sanction Paper

2 Project Detail

2.1 Background

The twenty-six (26) 11 kV circuit breakers at the Franklin Square #11 Substation are comprised of General Electric (GE) Type FH oil-filled circuit breakers and GE Type ARA air-blast units. The GE Type FH breakers are obsolete and slow to operate at 180 ms compared to a modern 5-cycle breaker at approximately 80 ms. They have deteriorated and aged insulation and parts. They were manufactured in 1938 (80 yrs old). This breaker family is being targeted for replacement under the approved Circuit Breaker and Recloser Asset Replacement Program (ARP). Seventeen (17) have been replaced since 2017.

The GE Type ARA breakers are of an obsolete design. In addition, two of these units recently failed and were replaced as a damage/failure project. The breaker failed to operate and further investigation indicated structural cracks in the mechanism. Two similar units other positions displayed the same issue and both were immediately replaced under damage/failure.

2.2 Drivers

Asset condition is the primary driver for this project and non wires is not an alternative. The breakers are obsolete, unreliable and have a high probability of failure. As system improvements and customer expansions are underway, this project is in-line with the company goals in this area.

2.3 Project Description

The project will replace twenty-six (26) circuit breakers at Franklin Square #11 substation in Providence, RI that are comprised of GE Type ARA air-blast and GE FH oil-filled design.

2.4 Benefits

Replacement of these breakers will assist with providing reliable service to the Company's customers in the area. It will also enhance the expansion and system improvement projects that are ongoing in the area as Franklin Square Substation provides the 11 kV supply to South Street Substation. [REDACTED]

Short Form Sanction Paper

2.5 Business & Customer Issues

Since these investments are designed for system improvements, they do not require a CIAC. There are no business or customer issues other than those already stated in this paper.

2.6 Alternatives

Alternative 1: Deferment

Deferment or do nothing is not recommended as the breakers have a high probability of failure, are obsolete, lack spare parts and manufacture support, are deteriorate and aged, and are slow to operate. Deferment or do nothing may result in interrupted service to a large amount of critical customers which would adversely affect the Company's reputation.

2.7 Investment Recovery

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.798M.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
C081006	D-Sub	Franklin Sq Breakers Fy19-FY23	4.550
Total			4.550

3.2 Associated Projects

N/A

3.3 Prior Sanctioning History

N/A

Short Form Sanction Paper

3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory	
<input checked="" type="radio"/> Policy- Driven	Substation Circuit Breaker & Recloser Strategy, 2009
<input type="radio"/> Justified NPV	
<input type="radio"/> Other	

3.5 Asset Management Risk Score

Asset Management Risk Score: 39

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 15

Short Form Sanction Paper

3.7 Next Planned Sanction Review

4 Financial

4.1 Business Plan

Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
NE Distribution Electric Capital Plan FY19 – FY23	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	4.550M

4.1.1 If cost > approved Business Plan how will this be funded?

Re-allocation of funds from the Breaker Replacement Program within the portfolio has been managed by Resource Planning to meet jurisdictional budgetary, statutory and regulatory requirements.

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

Project Number	Project Title	Project Estimate Level (%)	Spend	Prior Yrs	Current Planning Horizon (\$M)						Total
					Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
					2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
C081006	Franklin Sq Breakers Fy19-FY23	Est Lvl (e.g. +/- 10%)	CapEx	-	1.159	1.159	1.159	0.828	-	-	4.305
			OpEx	-	-	-	-	-	-	-	
			Removal	-	0.066	0.066	0.066	0.047	-	-	0.245
			Total	-	1.225	1.225	1.225	0.875	-	-	4.550
Total Project Sanction			CapEx	-	1.159	1.159	1.159	0.828	-	-	4.305
			OpEx	-	-	-	-	-	-	-	-
			Removal	-	0.066	0.066	0.066	0.047	-	-	0.245
			Total	-	1.225	1.225	1.225	0.875	-	-	4.550

REDACTED VERSION



Short Form Sanction Paper

4.4 Project Budget Summary Table

Project Costs per Business Plan

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
CapEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Cost in Bus. Plan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Variance (Business Plan-Project Estimate)

\$M	Prior Yrs (Actual)	Current Planning Horizon (\$M)						Total
		Yr. 1 2018/19	Yr. 2 2019/20	Yr. 3 2020/21	Yr. 4 2021/22	Yr. 5 2022/23	Yr. 6 + 2023/24	
CapEx	0.000	(1.159)	(1.159)	(1.159)	(0.828)	0.000	0.000	(4.305)
OpEx	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Removal	0.000	(0.066)	(0.066)	(0.066)	(0.047)	0.000	0.000	(0.245)
Total Cost in Bus. Plan	0.000	(1.225)	(1.225)	(1.225)	(0.875)	0.000	0.000	(4.550)

5 Key Milestones

Milestone	Target Date: (Month/Year)
Project Sanction	November 2018
Project Kick-off	November 2018
Procurement	November 2018
Construction Start	February 2019
Construction Complete - CC	January 2022
Project Closure Sanction	March 2022

6 Climate Change

Contribution to National Grid's 2050 80% emissions reduction target:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative
Impact on adaptability of network for future climate change:	<input checked="" type="radio"/> Neutral	<input type="radio"/> Positive	<input type="radio"/> Negative

Short Form Sanction Paper

7 Statements of Support

7.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Department	Individual	Responsibilities
Investment Planning	Glen DiConza	Endorses relative to 5-year business plan or emergent work
Resource Planning D-Sub	Mark Phillips	Endorses resources, cost, schedule
Distribution Planning	Al Labarre	Endorses scope, design, design standard
Engineering and Design	Mark Larrabee	Endorses scope, design, design standard
Engineering and Design	Leonard Swanson	Endorses scope, design, design standard

7.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

Function	Individual
Finance	Felicia Midkiff
Regulatory	Ed Turieo
Jurisdictional	Patricia Easterly
Procurement	Diego Chevere
Control Center	Michael Gallagher

7.1.3 List References

N/A

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Short Form Sanction Paper

8 Decisions

I:

- (a) APPROVE this paper and the investment of \$4.550M and a tolerance of +/-10%
- (b) NOTE that Banafsheh Tofigh is the Project Manager and has the approved financial delegation.

Signature..........Date.....11/29/18
David H. Campbell, Vice President ServCo Business Partnering, USSC Chair

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9 Other Appendices

9.1 Breaker Positions

1112, 1121, 1123, 1125, 1126, 1130
1141, 1149, 1153, 1160, 1164, 11GT3
2T11, 2T62, 3T11, 1B10G, 2B10G,
2207, 2521, 0764-30, 2326, 4239, 0766

Short Form Sanction Paper

Title:	Franklin Square Circuit Breaker Replacement	Sanction Paper #:	USSC – 15 - 277
Project #:	C068686	Sanction Type:	Sanction
Operating Company:	The Narragansett Electric Co.	Date of Request:	December 1, 2015
Author:	Eileen Duarte	Sponsor:	John E. Gavin, Vice President Asset Management Electric
Utility Service:	Electricity T&D	Project Manager:	Alex Neary

1 Executive Summary

1.1 Sanctioning Summary

This paper requests the sanction of C068686 in the amount of \$2.200M with a tolerance of +/- 10% for the purposes of full implementation.

This sanction amount is \$2.200M broken down into:

\$1.947M Capex
\$0.000M Opex
\$0.253M Removal

1.2 Project Summary

The project will replace eleven (11) circuit breakers at the Franklin Square #11 substation due to asset condition. The breakers are obsolete, lack spare parts, are slow to operate and are unreliable. The replacement of these breakers is necessary to support ongoing expansion and system improvement work in the area.

2 Project Detail

2.1 Background

The eleven (11) 11 kV circuit breakers at the Franklin Square #11 Substation are comprised of General Electric Type FH oil-filled and General Electric Type ARA air-blast units. The GE Type FH breakers are obsolete and slow to operate at 180 ms compared to a modern 5-cycle breaker at ~ 80 ms. They have deteriorated and aged insulation

Short Form Sanction Paper

and parts. This breaker family is being targeted for replacement under the approved Circuit Breaker and Recloser Asset Replacement Program (ARP).

The GE Type ARA breakers are of an obsolete design. In addition, two of these units recently failed and were replaced as a damage/failure project. The breaker failed to operate and further investigation indicated structural cracks in the mechanism. A sister unit displayed the same issue and both were immediately replaced.

Furthermore, in preparation for the South Street rebuild project and the Fields Point LNG expansion project, replacement of these breakers will improve system performance as the 11.5 kV provides the supply to both these locations. [REDACTED]

[REDACTED] This system improvement will assist in providing continued reliable service to our customers.

2.2 Drivers

Asset condition is the primary driver for this project and non wires is not an alternative. The breakers are obsolete, unreliable and have a high probability of failure. As system improvements and customer expansions are underway, this project is in-line with our goals in this area.

2.3 Project Description

The project will replace eleven (11) circuit breakers at Franklin Square #11 substation in Providence, RI. Eight (8) of the breakers are the GE Type ARA air-blast design and six (6) are the GE FH oil-filled design. The breaker equipment position numbers and one-line diagram can be found in the appendix.

2.4 Benefits

Replacement of these breakers will assist with providing reliable service to our customers. It will enhance the expansion and system improvement projects that are ongoing in the area as Franklin Square Substation provides the 11 kV supply to South Street Substation. [REDACTED]

2.5 Business & Customer Issues

Since these investments are designed for system improvements, they do not require a CIAC.

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2.6 Alternatives

Alternative 1: Deferment

Deferment is not recommended as the breakers have a high probability of failure, are obsolete, lack spare parts and manufacture support, are deteriorate and aged, and are slow to operate. Deferment may result in interrupted service to a large amount of critical customers adversely affecting the Company's reputation.

2.7 Investment Recovery

2.7.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.389M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
C068686	D-Sub	Franklin Square Circuit Breaker Replacements	\$2.200
Total			\$2.200

3.2 Associated Projects

Project Number	Project Type (Elec only)	Project Title	Estimate Amount (\$M)
C051203	D-Line	LNG Plant Svc Terminal Rd Prv DLine	1.099
C051204	D-Sub	LNG Plant Svc Terminal Rd Prv DSub	2.517
Total			3.616

3.3 Prior Sanctioning History

None

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3.4 Category

Category	Reference to Mandate, Policy, NPV, or Other
<input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other	Substation Circuit Breaker & Recloser Strategy, 2009

3.5 Asset Management Risk Score

Asset Management Risk Score: 39

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability
☐ Environment
☐ Health & Safety
☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity
☒ Medium Complexity
☐ Low Complexity
☐ N/A

Complexity Score: 15

3.7 Next Planned Sanction Review

N/A

4 Financial

4.1 Business Plan

This project will be funded through the Circuit Breaker Program placeholder C032278 in the amount of \$2.200M throughout the fiscal year 2017 and 2018.

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Business Plan Name & Period	Project included in approved Business Plan?	Over / Under Business Plan	Project Cost relative to approved Business Plan (\$)
NE Distribution Electric Capital Plan FY16 – FY20	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA	\$2.200

4.1.1 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio will be managed by Resource Planning to meet jurisdictional budgetary, statutory and regulatory requirements.

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

				Current Planning Horizon							
Project Description		Estimate Level	\$M	Prior Yrs	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
Project #	Description		Capex		2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	
C068686	Franklin Square Circuit Breaker Replacements	+/-10%	Opex	\$0.000	\$0.000	\$0.708	\$1.239	\$0.000	\$0.000	\$0.000	\$1.947
			Removal	\$0.000	\$0.000	\$0.046	\$0.207	\$0.000	\$0.000	\$0.000	\$0.000
			Total	\$0.000	\$0.000	\$0.754	\$1.446	\$0.000	\$0.000	\$0.000	\$2.200

4.4 Project Budget Summary Table

Project Costs Per Business Plan

Project Budget Summary Table			Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	Total
Project Costs per Business Plan			Prior Yrs	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
	Capex	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
	Opex	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
	Removal	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
	Total Cost in B Plan	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000

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Variance (Business Plan-Project Estimate)

* P/Y Actuals			Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6 +	
Variance (Business Plan-Project)		Prior Yrs	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
	Capex	\$0.000	\$0.000	(\$0.708)	(\$1.239)	\$0.000	\$0.000	\$0.000	(\$1.947)
	Opex	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
	Removal	\$0.000	\$0.000	(\$0.046)	(\$0.207)	\$0.000	\$0.000	\$0.000	(\$0.253)
	Total Variance	\$0.000	\$0.000	(\$0.754)	(\$1.446)	\$0.000	\$0.000	\$0.000	(\$2.200)

5 Key Milestones

Milestone	Target Date: (Month/Year)
Project Sanction	12/15
Project Kick-off	12/16
Procurement of Materials/Contractor Begin	12/16
Construction Start	05/16
Construction Complete	12/17
Project Closeout	03/18

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

Role	Name	Responsibilities
Investment Planner	Glen DiConza	Endorses relative to 5-year business plan or emergent work
Resource Planning D-Sub	Mark Phillips	Endorses resources, cost, schedule
Distribution Planning	Alan Labarre	Endorses scope, design, design standard
Engineering and Design	Susan Martuscello	Endorses scope, design, design standard
Engineering and Design	Leonard Swanson	Endorses scope, design, design standard

6.1.2 Reviewers

Short Form Sanction Paper

The reviewers have provided feedback on the content/language of the paper.

Reviewer List	Name
Finance	Keith Fowler
Regulatory	Peter Zschokke
Jurisdictional Delegates	James Patterson
Procurement	Art Curran
Control Centers	Michael Gallagher

6.1.3 List References

1	Circuit Breaker and Recloser Strategy 2009
---	--

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Short Form Sanction Paper

7 Decisions

- I:
- (a) APPROVE this paper and the investment of \$2.200M and a tolerance of +/- 10%
 - (b) NOTE that Alex Neary is the Project Manager and has the approved financial delegation.

Signature..........Date..........
Executive Sponsor – Marie Jordan, Senior Vice President, Electric Process & Engineering

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8 Other Appendices

8.1 *Equipment to be Replaced Under this Project:*

Equipment Position	Manufacturer	Model	Operating kV
1162 OCB	GENERAL ELECTRIC	FH-129	11.5
11G OCB	GENERAL ELECTRIC	FH-129	11.5
11G3T OCB	GENERAL ELECTRIC	FH-129	11.5
1T11 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
2024 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
2058-2115 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
2T11 OCB	GENERAL ELECTRIC	FH-129	11.5
2T62 OCB	GENERAL ELECTRIC	FH-129	11.5
3320 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
3324 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
3T11 OCB	GENERAL ELECTRIC	FH-129	11.5

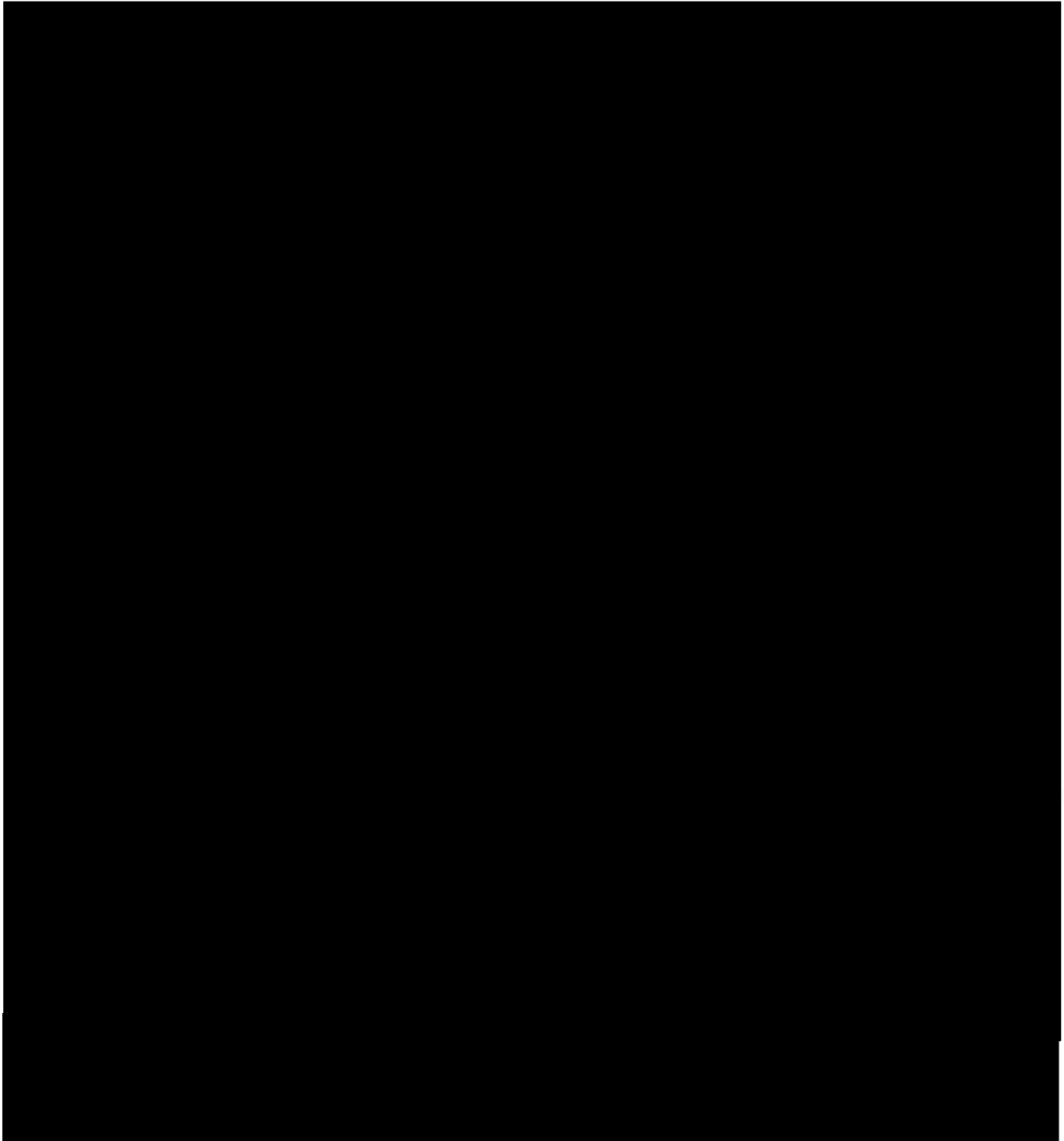
Equipment to be Replaced Under the Associated Project (PFN C051204):

Equipment Position	Manufacturer	Model	Operating kV
1060 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
2260 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5
2210 ACB	GENERAL ELECTRIC	ARA-15-1500	11.5

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FRANKLIN SQ. & SWYD NO. 11
11.5KV MANCHESTER ST. STA., GEN. NO. 9
SHEET 1 OF 4

03-31-07

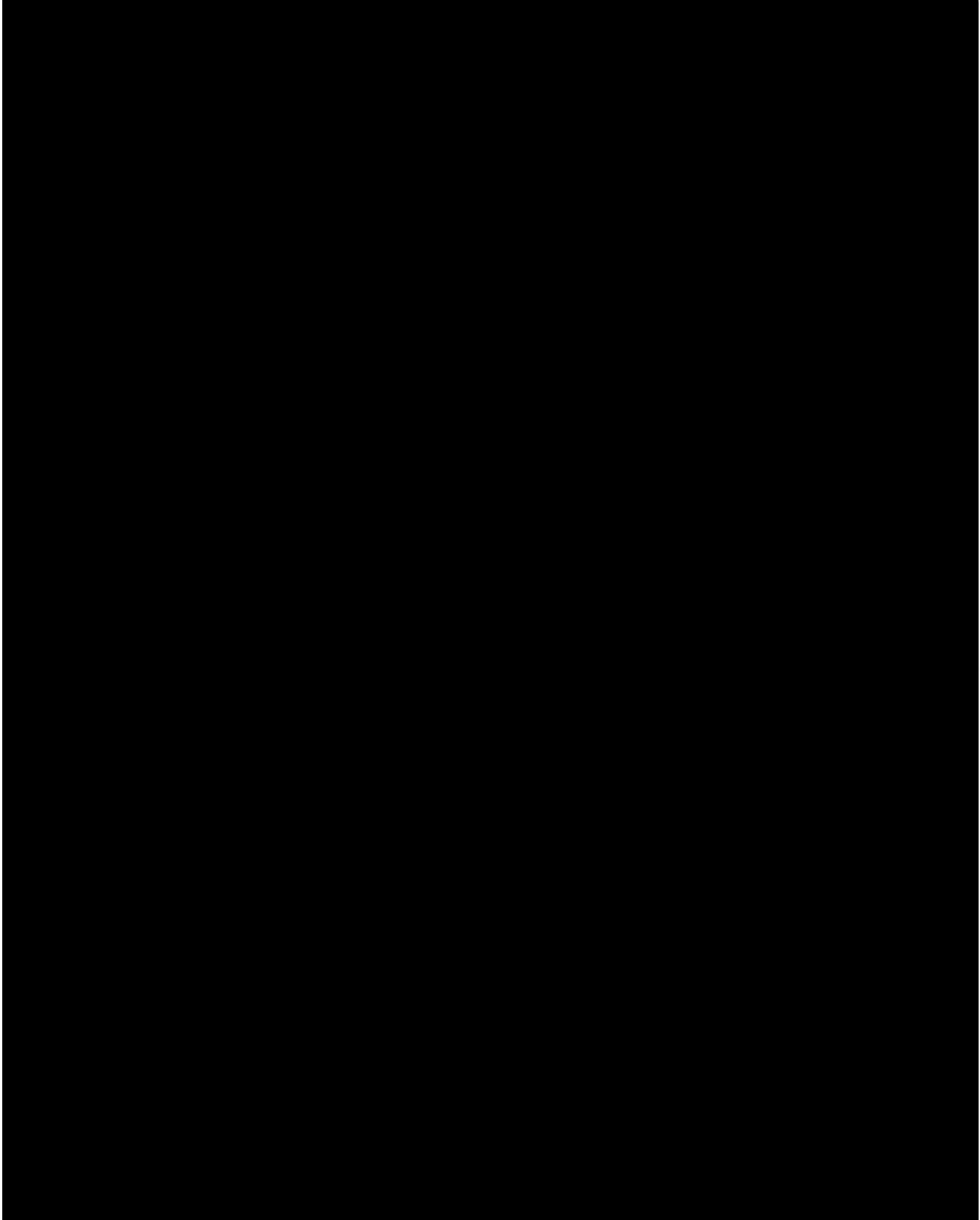
OCEAN STATE DIVISION

OS5160A

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Short Form Sanction Paper



01-17-06

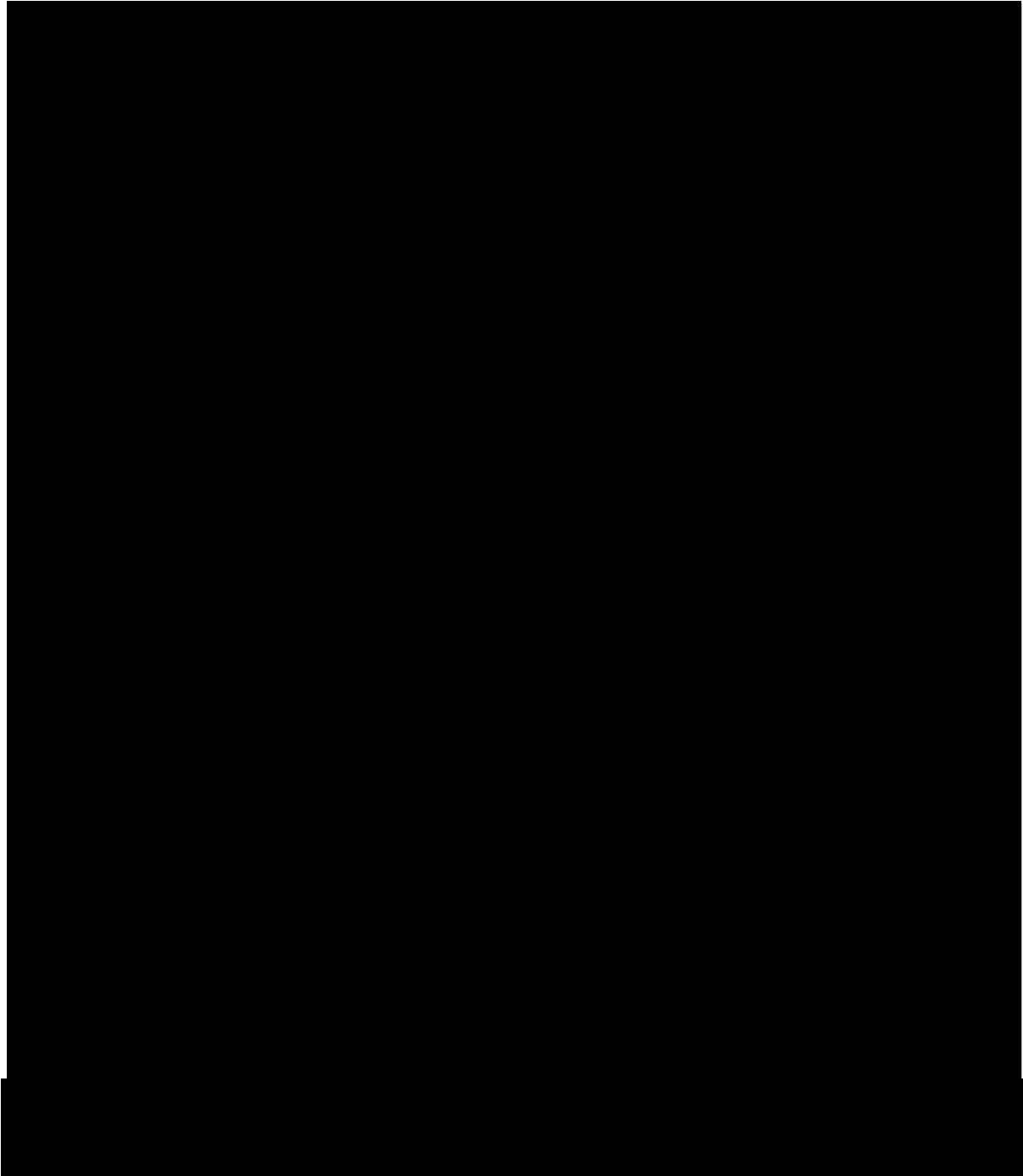
SHEET 2 OF 4
OCEAN STATE DIVISION

OS5160B

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Short Form Sanction Paper



FRANKLIN SQ. & SWYD NO. 11

11.5KV

SHEET 3 OF 4

OCEAN STATE DIVISION

OS5160C

06/25/07

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Short Form Sanction Paper

8.3 Sanction Request Breakdown by Project

N/A

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

R-III-3

Request:

Provide a historical summary of Franklin Square Breaker project work for each fiscal year including number, type of breaker, and budget for both scheduled and actual breaker replacement work performed. Explain any years where breaker work was started but completed in the following fiscal year. Provide a breakdown of budget versus actual spend for each completed breaker and explanations for variances over ten percent.

Response:

See Attachment DIV R-III-3.

FP#	FP Description	FY16 Capex Budget (\$K)	FY16 Capex Actual (\$K)	FY17 Capex Budget (\$K)	FY17 Capex Actual (\$K)	FY18 Capex Budget (\$K)	FY18 Capex Actual (\$K)	FY19 Capex Budget (\$K)	FY19 Capex Actual (\$K)	FY20 Capex Budget (\$K)	FY20 Capex Forecast (\$K)	Description of Work	Brkr Pos	Brkr Type	Brkr Inservice Date	Comments
C051204	CUSTOMER PROJECT	\$ 30	\$ 17	\$ 256	\$ 1,452	\$ 1,507	\$ (509)	\$ 48	\$ 3	\$ -	\$ -	Replace 3 breakers as part of new 11MW Customer service interconnection project.	1060 2210 3360	ARA-15-1500-3 ARA-15-1500-3 ARA-15-1500-3	3/10/2017 6/10/2018 2/14/2017	Budget and actual spend shown includes work associated with full scope of project.
C074892	FRANKLIN SQUARE 11G BREAKER REPL	\$ -	\$ -	\$ -	\$ 179	\$ -	\$ 2	\$ -	\$ -	\$ -	\$ -	DAMAGE FAILURE - Replace 11G generator breaker due to in-service failure.	11G	FH-129	1/4/2017	Damage Failure project
C078474	FRANKLIN SQ SUB_1105 & 1109 NW	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 201	\$ 250	\$ 351	\$ 250	\$ 42	Replace 3 breakers to accommodate two network circuits (1105 and 1109) to Franklin Square.	1120 1142 1144	FH-129 FH-129 FH-129	3/23/2018 2/4/2018 3/1/2018	Project still active to allow for cable cutovers once Dyer Street work is ready. Costs to date primarily represent breaker costs, remaining other project scope work expected to occur
C068686	FRANKLIN SQ BREAKER REPLACEMENTS	\$ -	\$ -	\$ -	\$ 408	\$ 1,450	\$ 1,866	\$ -	\$ (265)	\$ -	\$ 175	Replace as part of breaker strategy.	1123 1132 1143 1162 3320 3324 1158-2115 1T11 2058-2115 2T11 2T62	FH-129 AR-15-1500 AR-15-1500 FH-129 AR-15-1500 AR-15-1500 AR-15-1500 AR-15-1500 AR-15-1500 FH-129 FH-129	1/9/2018 10/24/2017 10/26/2017 2/23/2018 5/13/2017 6/21/2017 8/26/2017 9/16/2017 5/20/2017 12/18/2017 2/24/2018	Actual and forecasted capital costs are \$2.3m. Project sanction was for \$1.9m for 11 breakers
C081006	FRANKLIN SQ BREAKER REPLACEMENT	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,143	\$ 900	\$ 199	Replace as part of breaker strategy.	1141 1149 1160 2024 2220 4960 1B10G	AR-15-1500-3 AR-15-1500 AR-15-1500 AR-15-1500 AR-15-1500 AR-15-1500 FH-126 1500	5/11/2019 6/8/2019 5/15/2019 6/4/2019 6/8/2019 6/21/2019 8/22/2019	Breaker purchase started in FY19 so that units would be ready for Spring '19 install.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

R-III-4

Request:

Provide the Company's breaker replacement program documentation.

Response:

See Attachment R-III-4 for the Distribution Substation Circuit Breaker and Recloser Strategy Paper. This attachment contains confidential pricing information.

Accordingly, the Company is providing the confidential and redacted versions of Attachment R-III-4, together with a Motion for Protective Treatment.

Distribution Substation Circuit Breaker and Recloser Strategy Statement

The method for managing substation breakers and reclosers consists of periodic maintenance and ‘replace on condition’. This approach is being augmented by a replacement program targeting aged/unreliable breaker families, units in poor condition and a formal spares policy as we first move to condition-based maintenance then risk/criticality-based maintenance. Aged units have been specifically identified for replacement because they are difficult to repair due to the lack of available spare parts. Likewise, unreliable units have been identified for replacement because their replacement would reduce the number of customer interruptions.

The total breaker population is in excess of 7,000 units consisting mainly of distribution assets with a few transmission assets managed by distribution (sub-transmission). Identified families of breakers targeted for replacement consist of approximately 940 units recommended for replacement in the next ten years. An additional 2,395 units are recommended for replacement in the next ten years based on a recently completed condition review.

The condition-based replacement program outlined in this strategy will be implemented over the next five years. This will permit the process of identifying and prioritizing the work to take place and allow for a smoother budgeting transition from the current to proposed state.

Once this strategy is in place, the annual capital budget is expected to be approximately \$8M for the first four years increasing to \$31M over the next six years. This sharp change after four years is due to the shift in replacement time frames between condition 3 (less than 5 years) and condition 2 (five to ten years) breakers. The high-level budget for the first ten years of the program is outlined in Table 1. These estimated costs are for breakers identified as likely one-for-one replacements and do not include breakers being replaced as part of a complete substation rebuild or replacement.

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 7,900,000		\$ 7,900,000
2	\$ 7,900,000		\$ 7,900,000
3	\$ 7,900,000		\$ 7,900,000
4	\$ 7,900,000		\$ 7,900,000
5		\$ 31,300,000	\$ 31,300,000
6		\$ 31,300,000	\$ 31,300,000
7		\$ 31,300,000	\$ 31,300,000
8		\$ 31,300,000	\$ 31,300,000
9		\$ 31,300,000	\$ 31,300,000
10		\$ 31,300,000	\$ 31,300,000
Total	\$ 31,600,000	\$ 187,800,000	\$ 219,400,000

Table 1 - Breaker Strategy High Level Budget

The performance target for this strategy is:

- Replace all breakers within the defined time-frame based on the condition codes

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The primary benefits/risks associated with this strategy are the elimination of potentially hazardous/unreliable units from the system.

Additionally the following items require attention to better implement and manage these assets:

- Reconciliation of the spares population is needed to verify the spares population and support the creation of the spares policy. This is currently underway as part of the AIMMS conversion to Cascade that is expected to be complete by the end of 2009. The data in Cascade needs to be reviewed to confirm the reconciliation process has been completed and is accurate. This will be completed by the end of calendar year 2009.
- Support for condition codes and impact should be integrated into Cascade to provide a central location to store this information. This is currently underway as part of the AIMMS conversion to Cascade that is expected to be complete by the end of 2009.
- Condition codes must be reviewed annually and verified based upon breaker diagnostic test results and operational performance. This will support the improvement of the condition code process and insure accurate and reasonably current data is available for these assets.
- Substation Maintenance Standards (SMS) are required to document the conditions under which targeted families of breakers are replaced/refurbished. The Substation O&M Services group has agreed to begin reviewing the list of targeted families and create SMS's to support the replacement/refurbishment of the equipment. The target is to review two families annually and either create an SMS for the equipment or remove the family from the targeted list.

Table 2 - Amendments Record

Issue	Date	Summary of Changes	Author(s)	Approved By (Inc. Job Title)
2	10/14/2009	Updated data, added detail to breaker family descriptions, aligned benefits and risks to OSP objectives, added performance targets, added state specific sections	Jeffrey H. Smith Distribution Asset Strategy	John Pettigrew Executive Vice President, Electric Distribution Operations Chairman of DCIG
1	01/03/2008	Initial Issue	Anthony McGrail Substation Engineering Services	John Pettigrew Executive Vice President, Electric Distribution Operations

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Strategy Justification

1.0 Purpose and Scope

This document sets out the asset management strategy for substation breakers and reclosers.

This document refers throughout to circuit breakers, or just breakers, as a generic way of identifying both circuit breakers and reclosers.

The method for managing substation breakers and reclosers consists of periodic maintenance and ‘replace on condition’. This approach is being augmented by a replacement program targeting aged/unreliable breaker families, units in poor condition and a formal spares policy as we first move to condition-based maintenance then risk/criticality-based maintenance. Aged units have been specifically identified for replacement because they are difficult to repair due to the lack of available spare parts. Likewise, unreliable units have been identified for replacement because their replacement would reduce the number of customer interruptions.

2.0 Background

2.1 Substation Maintenance Procedures

Circuit breakers are inspected during the regular (at least bimonthly) Visual and Operational (V&O) check and annual Infrared (IR) rounds¹.

All breakers and reclosers undergo a mechanical check every three years, including a breaker timing diagnostic check. Oil breakers undergo a full diagnostic check at six-year intervals, while other units have a full diagnostic check at nine-year intervals².

2.2 Data

AIMMS has 7,129 operating breakers recorded, with 6,964 of those having either an install or manufacture date. The age profile, Figure 1, shows that about 24% of units are greater than 50 years old, with 11% at greater than 60 years old. There is an age peak at about 80 years, relating predominantly to indoor substations across the service territory. Approximately 82% of the operating breaker population is distribution assets (DxD) while 18% are transmission assets maintained by distribution (TxD). Older breakers though inherently not less reliable due to age, are more difficult to maintain, may not meet the specifications needed for modern electrical systems and may have no support in terms of replacements or spare parts.

AIMMS has 295 spare breakers recorded, with 270 of those having either an install or manufacture date. The age analysis indicates that about 28% of units are greater than 50 years old, with 15% at greater than 60 years old. The accuracy of the spares population stored in AIMMS has been called into question by field supervisors across the service territory. A reconciliation of the spares population is needed to verify the spares population and support the creation of the spares policy. The reconciliation process is underway as part of the AIMMS conversion to Cascade that is expected to be complete by the end of 2009. The data in

¹ Reference 1, SMS 400.06.1

² Reference 2, SMS 401.01.1 through SMS 401.07.1

REDACTED VERSION

National Grid US EDO Internal Strategy Document
Distribution Substation Circuit Breaker and Recloser Strategy
Issue 2 – October 2009

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Cascade needs to be reviewed to confirm the reconciliation process has been completed and is accurate. This will be completed by the end of calendar year 2009.

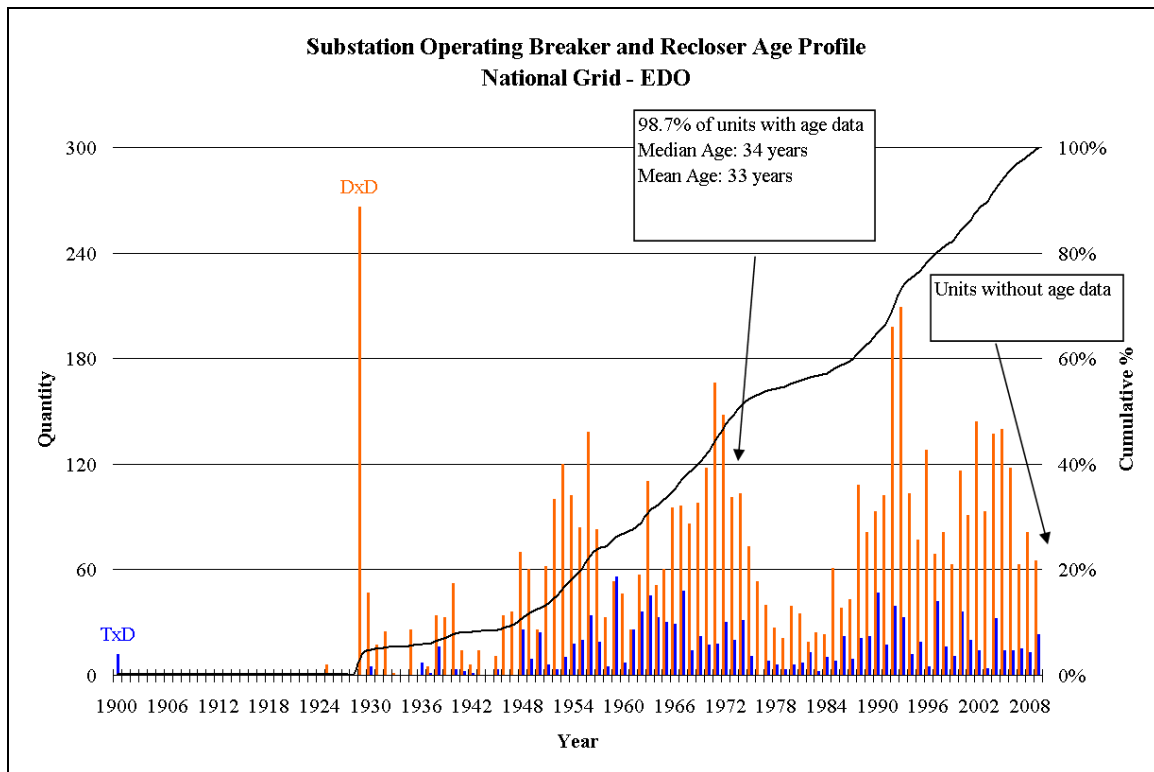


Figure 1 - Breaker and Recloser Age Profile

The distribution of breakers and reclosers by kV shows that most are 4 kV and 13 kV, Figure 2.

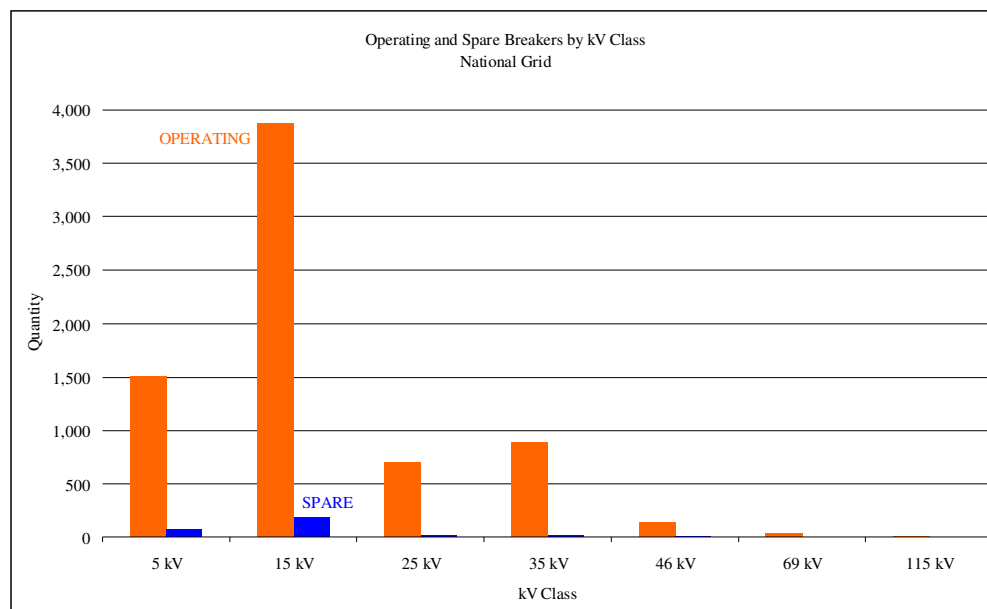


Figure 2 - Breakers and Reclosers by kV

2.3 Condition Assessment

The approach for breaker condition coding was based on engineering judgment and experience and was supported by discussion with local field staff. These condition codes were reviewed and updated in June of 2009. On-going breaker maintenance and inspection generates further knowledge and understanding of breaker condition.

Condition Code	Classification/Condition	Implication
1 Proactive	<ul style="list-style-type: none"> Asset expected to operate as designed for more than 10 years 	Appropriate maintenance performed; regular inspections performed
2 Proactive	<ul style="list-style-type: none"> Some asset deterioration or known type/design issues Obsolescence such that spares/replacement parts are not available System may require a different capability at asset location 	Asset likely to be replaced or refurbished in five to ten years; increased resources may be required to maintain/operate asset
3 Proactive	<ul style="list-style-type: none"> Asset condition is such that there is an increased risk of failure Test and assessment identifies definite ongoing deterioration 	Asset likely to be replaced or refurbished in less than five years; increased resources may be required to maintain/operate asset
4 Reactive	<ul style="list-style-type: none"> Asset has sudden and unexpected change in condition that is of immediate concern This may be detected through routine diagnostics including inspections, annual testing, maintenance or following an event 	Testing and assessment required to determine if asset may be returned to service or may be allowed to continue in service Following engineering analysis the asset will be either recoded to 1-3 or removed from the system

Table 3 - Substation Asset Condition Code Definitions

In addition to condition codes, many substations have impact codes representing the relative importance of interruptions at the substation. These impact codes are derived in part from feeder load shedding priorities established by the System Control Centers and the local knowledge and expertise of the O&M services group. The impact codes will be used to prioritize breakers within each condition code grouping.

Of the 7,129 operating breakers on the distribution system, 3,790 are condition 1, 2,496 are condition 2 and 843 are condition 3. The results of this condition assessment are summarized in Figure 3.

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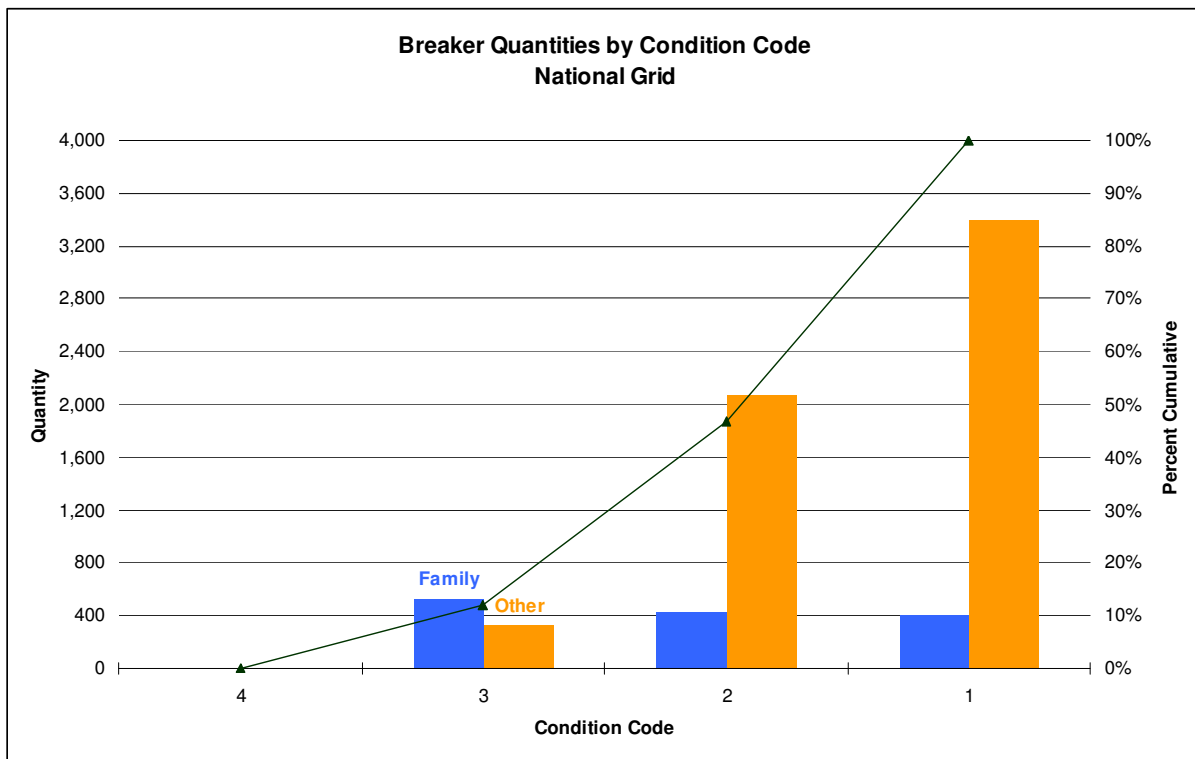


Figure 3 - Breaker Quantities by Condition Code

2.4 Targeted Breaker Families

The following section covers those breaker families that are recommended for accelerated replacement due to either age or poor reliability. A brief description of the issue follows along with a reference to the associated Substation Maintenance Standard (SMS), if available, covering the equipment replacement. Presently, many of these replacement groupings are based on anecdotal evidence that has not been completely documented. An action item to create SMS's for all targeted family replacements is being recommended by this strategy to formalize the replacement approach. Delaying these breaker family replacements will result in an increase in the possibility of the particular issue associated with the family occurring. The details of replacing targeted breakers is discussed in Section 4.0, but to summarize the approach, targeted breaker families will be replaced as part of both one-for-one replacements and larger substation projects. In general, most of the targeted families are at indoor or metalclad locations.

Condit breakers

78 units are currently in service with an average age of 69 years. These breakers are installed at indoor locations. These units are obsolete due to lack of spare parts and increasing maintenance costs. The units in this family are condition code 3 and recommended for replacement within the next five years. In general, these units will be replaced as part of a larger substation project.

Federal Pacific (FP) breakers

33 units are currently in service with an average age of 46 years. These breakers are primarily installed at indoor or metalclad locations. There are two types of FP breakers on the system, air-magnetic (AM) and oil, both of which are technologically obsolete. These units are obsolete due to lack of spare parts, frequent rebuild requirements (every 5 years) and unreliability (slow or improper tripping). The units in this family

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are condition code 3 and recommended for replacement within the next five years. In general, these units will be replaced as part of one-for-one replacement projects.

General Electric (GE) Type AM breakers

526 units are currently in service with an average age of 45 years. These breakers are installed at metalclad locations. These units are obsolete due to lack of spare parts, frequent mechanism rebuild requirements (every 8-10 years), obsolescence of air-magnetic (AM) interrupting technology, presence of asbestos in arc chutes and arc-flash problems. It is possible to refurbish the interrupters with vacuum technology. Many of the breakers in this group have condition codes of 1, only the units with condition codes of 2 or 3 (179 breakers) are recommended for replacement at the present time. The remaining condition code 1 breakers will be monitored and the condition codes updated over time. The 179 units within this target group will be prioritized by condition and impact followed by age (due to the large quantity of target units). The targeted units in this family are recommended for replacement/refurbishment within the next ten years. In general, these units will be replaced as part of one-for-one replacement projects.

General Electric (GE) Type FH breakers

127 units are currently in service with an average age of 68 years. These breakers are installed at indoor locations. These units are obsolete due to lack of spare parts, slow operation (180 ms compared to modern 5-cycle breaker at ~ 80 ms) and the potential for failure. The units in this family are condition code 3 and recommended for replacement within the next five years. In general, these units will be replaced as part of a larger substation project.

General Electric (GE) Type VIR reclosers

50 units are currently in service with an average age of 38 years. These breakers are installed at outdoor locations. These units are obsolete due to unavailability of spare parts, increasing maintenance requirements and increasing in-service failures. The units in this family are condition code 3 and recommended for replacement within the next five years. SMS 401.40.1 provides the detailed conditions to justify unit replacement. In general, these units will be replaced as part of one-for-one replacement projects.

ITE Type HK breakers

215 units are currently in service with an average age of 40 years. These breakers are installed at metalclad locations. These units are obsolete due to mechanism issues. The units in this family are recommended for replacement within the next ten years, prioritized by condition and impact. As more information on this family of breakers is gathered, the replacement approach will be refined. In general, these units will be replaced as part of one-for-one replacement projects.

ITE Type KS breakers

114 units are currently in service with an average age of 40 years. These breakers are installed at outdoor locations. These units are obsolete due to mechanism issues. Many of the breakers in this group have condition codes of 1, only the units with condition codes of 2 or 3 (62 breakers) are recommended for replacement at the present time. The remaining condition code 1 breakers will be monitored and the condition codes updated over time. The 62 units in this target group are recommended for replacement within the next ten years, prioritized by condition and impact. As more information on this family of breakers is gathered, the replacement approach will be refined. In general, these units will be replaced as part of one-for-one replacement projects.

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McGraw-Edison (ME) Type VSA reclosers

37 units are currently in service with an average age of 28 years. These breakers are installed at outdoor locations. Specific units within a given manufacture date range and serial number range are obsolete due to current interchanger issues. The units in this family are condition code 2 and recommended for replacement within the next five to ten years. SMS 401.41.1 provides the detailed conditions to justify unit replacement. In general, these units will be replaced as part of one-for-one replacement projects.

Westinghouse (WE) Type DHP breakers

167 units are currently in service with an average age of 37 years. These breakers are installed at metalclad locations. These units are obsolete due to AM interrupting technology. It is possible to refurbish the interrupters with vacuum technology. The units in this family are recommended for replacement/refurbishment within the next ten years, prioritized by condition and impact. In general, these units will be replaced as part of one-for-one replacement projects.

2.5 Interruption Events

There have been approximately 123 interruption events attributed to breakers across our service territory over the last five years. These events resulted in a SAIFI of 0.008 and a SAIDI of 0.78 minutes on a five-year average basis from 2004 to 2008. The five-year average outage duration was 103 minutes.

3.0 **Benefits**

3.1 Safety and Environmental

Several of the targeted breaker families present opportunities to reduce potential hazards associated with safety and the environment (oil, asbestos).

3.2 Reliability

Breaker failures and mis-operations contribute a small number of events each year but these events typically involve a large number of customers (> 1000) per event. This strategy will help improve reliability by proactively replacing or refurbishing units with poor reliability or mitigate the risk of future unreliability. The overall five-year average reliability opportunity is a 0.008 reduction in system SAIFI and 0.78 minutes in system SAIDI.

3.3 Customer/Regulatory/Reputation

There are no significant benefits to external stakeholders beyond those outlined in the safety and environmental and reliability sections. Minimizing large-scale interruptions will help maintain favorable relationships with all external stakeholders.

3.4 Efficiency

There are no significant benefits to efficiency. Developing a long-range plan for managing the breaker population will avoid significantly increasing maintenance/repair costs associated with aged and obsolete equipment.

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4.0 Estimated Costs

The estimates contained within this strategy are generic and only account for the costs associated with the breaker replacement (breaker installation and foundation work). Additionally these costs are high-level estimates intended to support long-range budgeting and are not intended to be used directly to support any near-term (12-18 months) budgeting. Consideration should be given to the condition of entire breaker system during replacements including relays, control cables and power supply systems. The overall condition of the substation should be reviewed prior to replacing breakers especially at indoor and metalclad locations. Additionally, a review of the future area needs (by Network Asset Planning) may be required at locations with significant concentrations of older equipment and/or older system designs as one-for-one replacement may not be the best long term strategy.

The following tables provide a high-level budget to support a ten-year plan including details for the targeted breaker families and the overall population. These estimates do not include indoor locations or locations identified for major rebuilds/replacements because the cost of breaker replacement at these locations is only a small component of the overall project. Breaker replacements at indoor locations or substation replacement locations will be covered under the specific project and/or program associated with the location. Approximately 900 of the more than 3,300 breakers identified for replacement are not included in the budgetary estimates below due to this assumption. These estimates are geared toward locations where one-for-one breaker replacements are likely to be required. The Network Asset Planning group will provide more detail for the first few years of the plan. This detail will include the specific units to be replaced and more accurate cost estimates.

Breaker Replacement Cost Estimate Groups		
Voltage Class (kV)	Construction Type	Capital Cost
15 kV	Metalclad	\$ 35,000
15 kV	Outdoor	\$ 110,000
25 kV	Outdoor	\$ 130,000
35 kV	Outdoor	\$ 160,000
46 kV	Outdoor	\$ 190,000

Table 4 - Per Unit Breaker Replacement Cost Estimates

Breaker Family	Number of Units*	Per Unit Cost Estimate	Time Span	Annual Cost
Condit	12		< 5 years	
FP	27		< 5 years	
GE Type AM	174		10 years	
GE Type VIR	44		< 5 years	
ITE Type HK	209		10 years	
ITE Type KS	62		10 years	
ME Type VSA	37		5 to 10 years	
WE Type DHP	167		10 years	
All Other Condition 3	136		< 5 years	
All Other Condition 2	1,547		5 to 10 years	
*A small number of these units may already be in the process of being replaced.				

Table 5 – Summarized Breaker Replacement Cost Estimates by Family/Condition Code

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Rearranging this information into a ten-year plan produces the following:

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 7,900,000		\$ 7,900,000
2	\$ 7,900,000		\$ 7,900,000
3	\$ 7,900,000		\$ 7,900,000
4	\$ 7,900,000		\$ 7,900,000
5		\$ 31,300,000	\$ 31,300,000
6		\$ 31,300,000	\$ 31,300,000
7		\$ 31,300,000	\$ 31,300,000
8		\$ 31,300,000	\$ 31,300,000
9		\$ 31,300,000	\$ 31,300,000
10		\$ 31,300,000	\$ 31,300,000
Total	\$ 31,600,000	\$ 187,800,000	\$ 219,400,000
At substations with a mixture of breaker conditions, all breakers should be replaced as part of the same project if change in scope is not significant. All costs in 2009 dollars without inflation.			

Table 6 - Estimated Ten-Year Capital Plan

5.0 Implementation

The condition-based replacement program outlined in this strategy will be implemented over the next five years. This will permit the process of identifying and prioritizing the work to take place and allow for a smoother budgeting transition from the current to proposed state. The estimated costs in Table 6 represent spending levels after the program has been fully implemented. Current capital spending levels for circuit breaker replacement is approximately \$6M annually for one-for-one type replacements covering approximately 100 units. Specific substation projects typically replace an additional 10-20 units annually.

5.1 Performance Targets:

The performance target for this strategy is:

- Replace all breakers within the defined time-frame based on the condition codes

Achieving these performance targets will require a ramping up of the breaker replacements, which is expected to occur over the next five years.

6.0 Risk Assessment

6.1 Safety and Environmental

Failure to address the breaker families with identified issues will not reduce this potential hazard.

6.2 Reliability

Failure to address the breaker families and individual units with poor reliability performance will result in continued (and possibly more) interruptions involving large groups of customers (> 1000).

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6.3 Customer/Regulatory/Reputation

There are no significant risks to external stakeholders beyond those outlined in the safety and environmental and reliability sections.

6.4 Efficiency

There are no significant risks to efficiency related to this strategy. Not proactively managing these assets will lead to less predictable spending associated with equipment failures.

7.0 **Data Requirements**

7.1 Existing/Interim:

- AIMMS
- Problem Identification Worksheet (PIW)
- IDS

7.2 Proposed:

- Cascade
- Problem Identification Worksheet (PIW)
- IDS

7.3 Comments:

- Cascade is currently being configured with the goal of replacing AIMMS as the source for substation and other asset system information over the course of 2009
- Support for condition and impact codes should be integrated into Cascade to provide a central location to store this information. This is currently underway as part of the AIMMS conversion to Cascade that is expected to be complete by the end of 2009.
- Condition codes must be reviewed annually and verified based upon breaker diagnostic test results and operational performance. This will support the improvement of the condition code process and insure accurate and reasonably current data is available for these assets.
- Substation Maintenance Standards (SMS) will be written to document the conditions under which targeted units are replaced/refurbished. The Substation O&M Services group has agreed to begin reviewing the list of targeted families and create SMS's to support the replacement/refurbishment of the equipment. The target is to review two families annually and either create an SMS for the equipment or remove the family from the targeted list.

8.0 **References**

1. SMS 400.06.1
2. SMS 401.01.1 thru SMS 401.07.1

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Massachusetts Specifics

AIMMS has 2,117 operating breakers recorded, with 2,079 of those having an either an install or manufacture date. The age profile, Figure 4, shows that about 28% of units are greater than 50 years old, with 12% at greater than 60 years old. Approximately 94% of the operating breaker population is distribution assets (DxD) while 6% are transmission assets maintained by distribution (TxD). AIMMS has 149 spare breakers recorded.

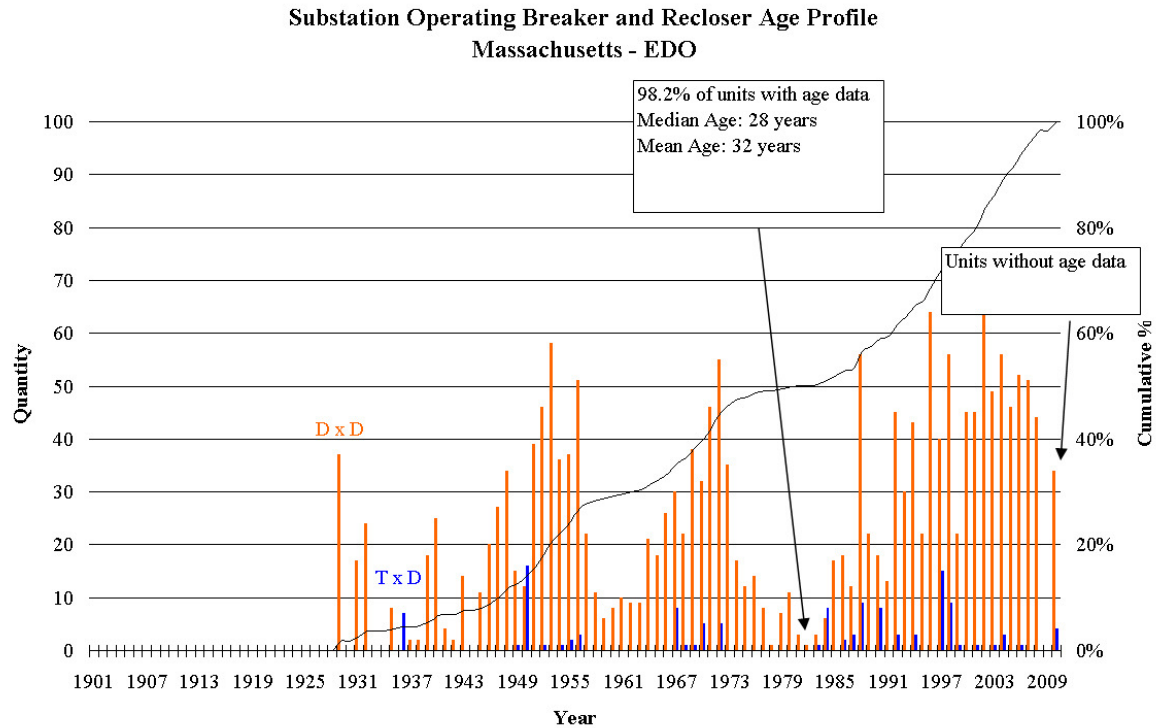


Figure 4 - Massachusetts Breaker Age Profile

Of the 2,117 operating breakers on the distribution system, 1,155 are condition 1, 648 are condition 2 and 314 are condition 3. The results of this condition assessment are summarized in the Figure 5.

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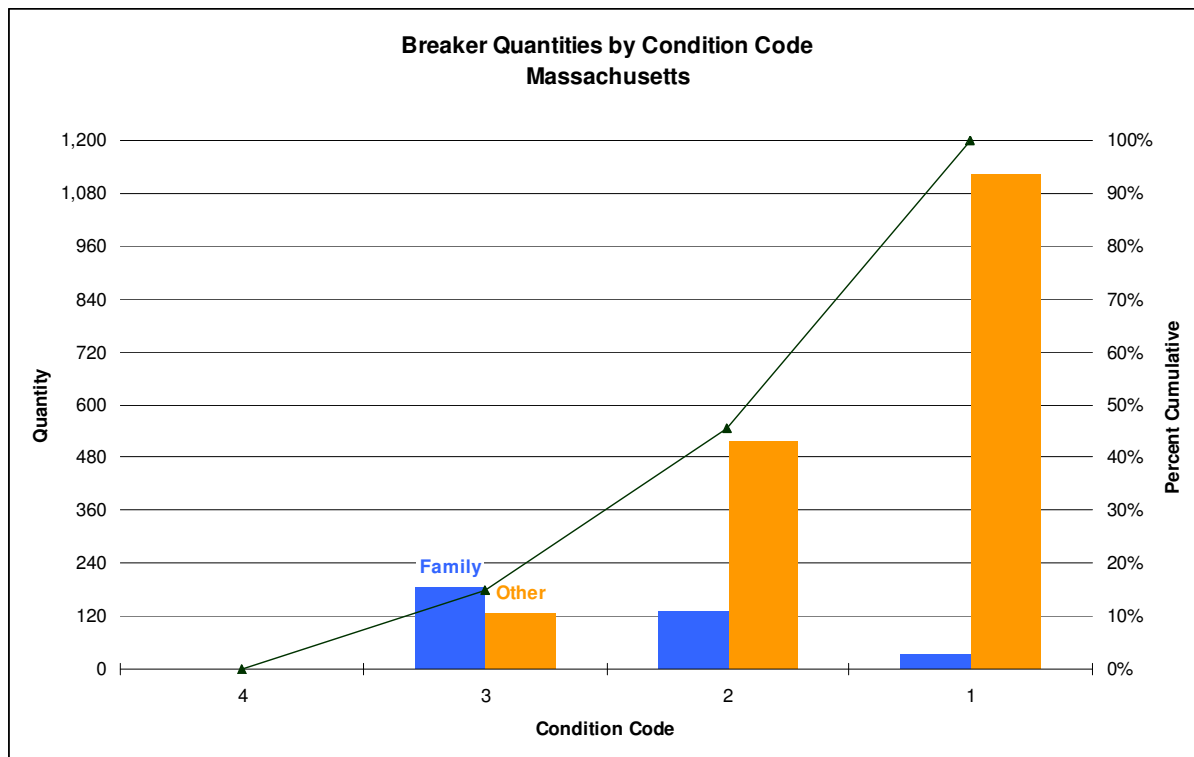


Figure 5 - Massachusetts Breaker Quantities by Condition Code

The following tables provide a high-level budget to support a ten-year plan including details for the targeted breaker families and the overall population (indoor and substation replacement locations are excluded as described in Section 4.0). The Network Asset Planning group will provide more detail for the first few years of the plan. This detail will include the specific units to be replaced and more accurate cost estimates.

Massachusetts				
Breaker Family	Number of Units*	Per Unit Cost Estimate	Time Span	Annual Cost
Condit	8		< 5 years	
GE Type AM	105		10 years	
GE Type VIR	21		< 5 years	
ITE Type HK	31		10 years	
ITE Type KS	1		< 5 years	
ME Type VSA	27		5 to 10 years	
WE Type DHP	47		10 years	
All Other Condition 3	51		< 5 years	
All Other Condition 2	294		5 to 10 years	
*A small number of these units may already be in the process of being replaced.				

Table 7 - Massachusetts Summarized Breaker Replacement Costs by Family/Condition Code

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Rearranging this information into a ten-year plan produces the following:

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 3,100,000		\$ 3,100,000
2	\$ 3,100,000		\$ 3,100,000
3	\$ 3,100,000		\$ 3,100,000
4	\$ 3,100,000		\$ 3,100,000
5		\$ 6,800,000	\$ 6,800,000
6		\$ 6,800,000	\$ 6,800,000
7		\$ 6,800,000	\$ 6,800,000
8		\$ 6,800,000	\$ 6,800,000
9		\$ 6,800,000	\$ 6,800,000
10		\$ 6,800,000	\$ 6,800,000
Total	\$ 12,400,000	\$ 40,800,000	\$ 53,200,000
At substations with a mixture of breaker conditions, all breakers should be replaced as part of the same project if change in scope is not significant. All costs in 2009 dollars without inflation.			

Table 8 - Massachusetts Estimated Ten Year Capital Plan

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New Hampshire/Vermont Specifics

AIMMS has 79 operating breakers recorded, with 78 of those having an either an install or manufacture date. The age profile, Figure 6, shows that about 23% of units are greater than 50 years old, with 14% at greater than 60 years old. Approximately 61% of the operating breaker population is distribution assets (DxD) while 39% are transmission assets maintained by distribution (TxD). AIMMS has one spare breaker recorded.

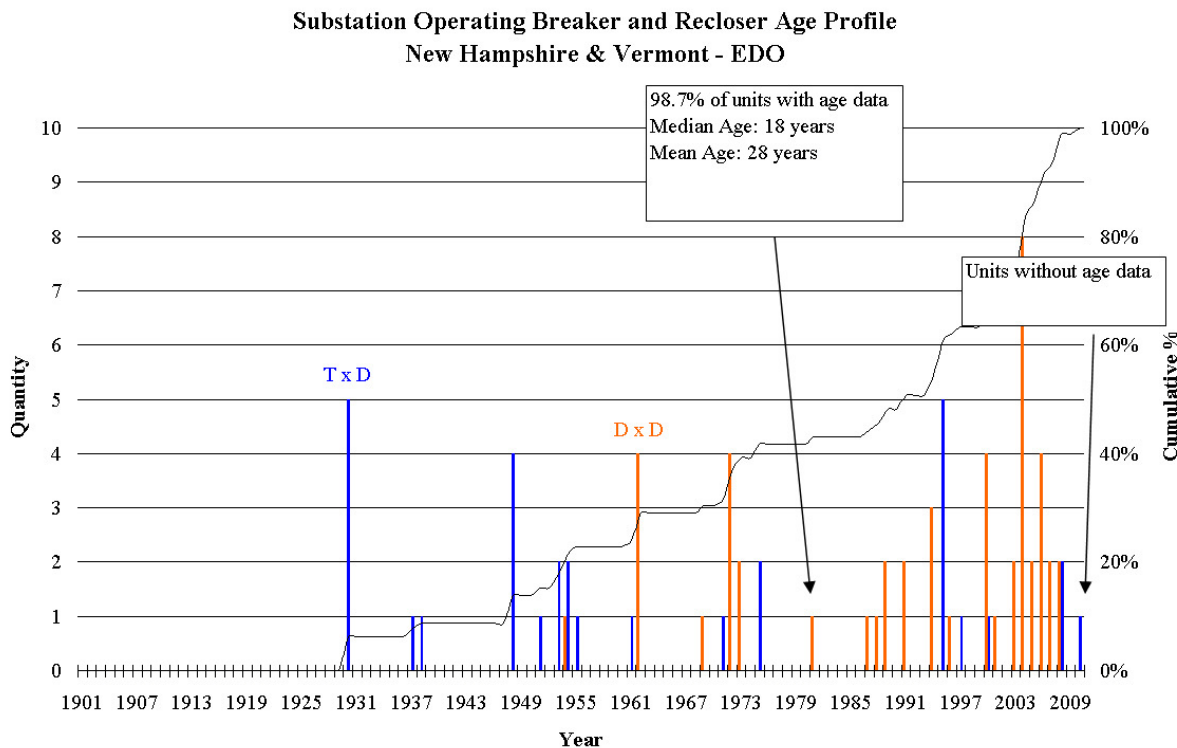


Figure 6 - New Hampshire/Vermont Breaker Age Profile

Of the 79 operating breakers on the distribution system, 46 are condition 1, 22 are condition 2 and 11 are condition 3. The results of this condition assessment are summarized in the Figure 7.

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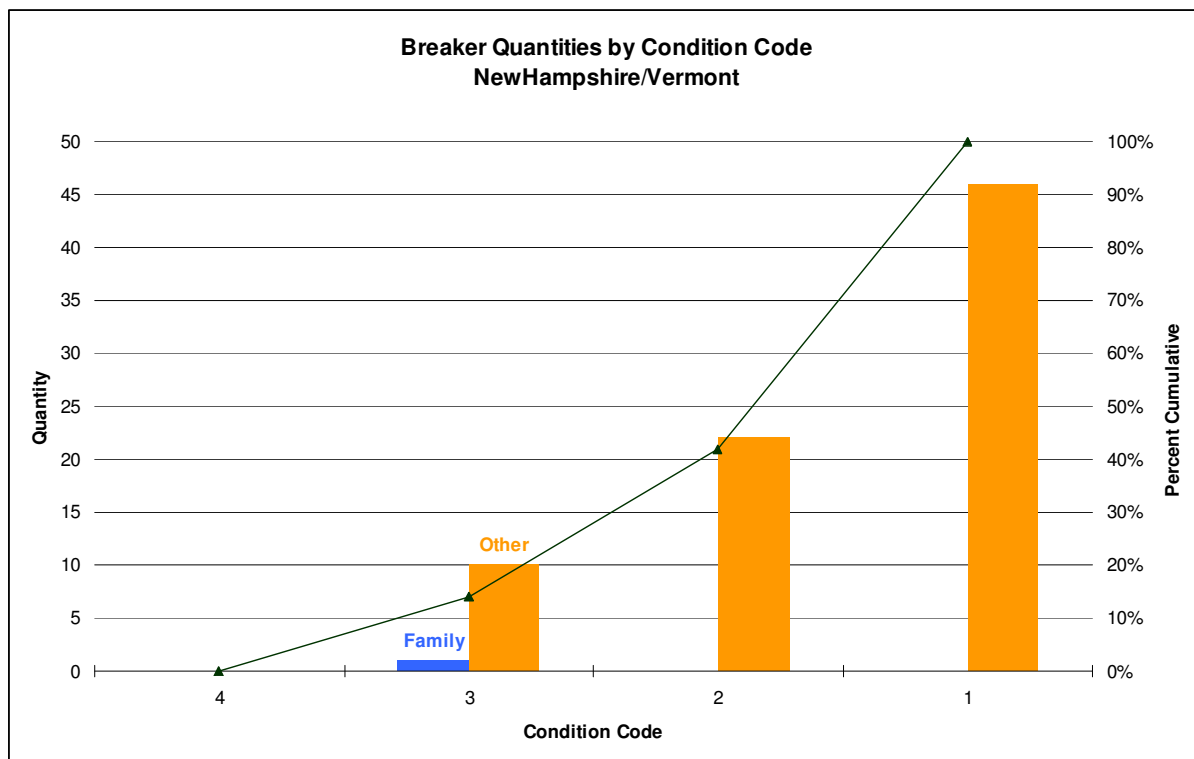


Figure 7 - New Hampshire/Vermont Breaker Quantities by Condition Code

The following tables provide a high-level budget to support a ten-year plan including details for the targeted breaker families and the overall population (indoor and substation replacement locations are excluded as described in Section 4.0). The Network Asset Planning group will provide more detail for the first few years of the plan. This detail will include the specific units to be replaced and more accurate cost estimates.

New Hampshire/Vermont				
Breaker Family	Number of Units*	Per Unit Cost Estimate	Time Span	Annual Cost
ME Type VSA	1		5 to 10 years	
All Other Condition 3	10		< 5 years	
All Other Condition 2	22		5 to 10 years	
*A small number of these units may already be in the process of being replaced.				

Table 9 - New Hampshire/Vermont Summarized Breaker Replacement Costs by Family/Condition Code

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Rearranging this information into a ten-year plan produces the following:

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 400,000		\$ 400,000
2	\$ 400,000		\$ 400,000
3	\$ 400,000		\$ 400,000
4	\$ 400,000		\$ 400,000
5		\$ 500,000	\$ 500,000
6		\$ 500,000	\$ 500,000
7		\$ 500,000	\$ 500,000
8		\$ 500,000	\$ 500,000
9		\$ 500,000	\$ 500,000
10		\$ 500,000	\$ 500,000
Total	\$ 1,600,000	\$ 3,000,000	\$ 4,600,000
At substations with a mixture of breaker conditions, all breakers should be replaced as part of the same project if change in scope is not significant. All costs in 2009 dollars without inflation.			

Table 10 - New Hampshire/Vermont Estimated Ten Year Capital Plan

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New York Specifics

AIMMS has 4,093 operating breakers recorded, with 3,987 of those having an either an install or manufacture date. The age profile, Figure 8, shows that about 21% of units are greater than 50 years old, with 9% at greater than 60 years old. Approximately 73% of the operating breaker population is distribution assets (DxD) while 27% are transmission assets maintained by distribution (TxD). AIMMS has 108 spare breakers recorded.

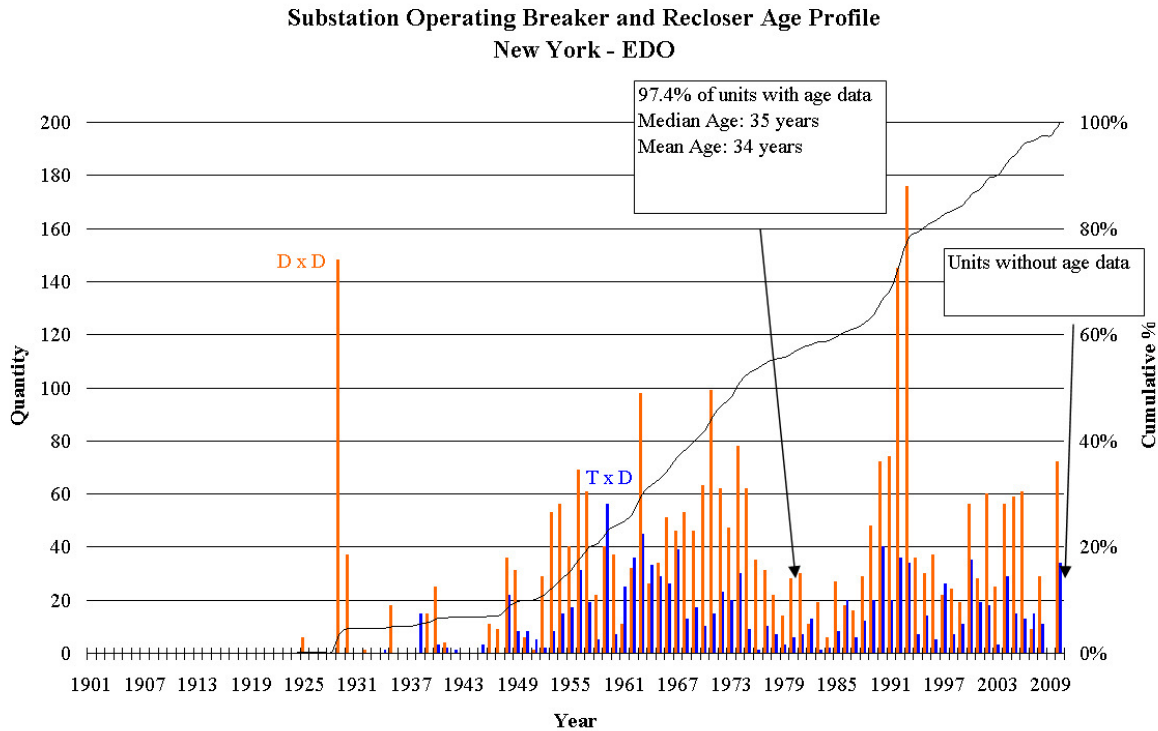


Figure 8 - New York Breaker Age Profile

Of the 4,093 operating breakers on the distribution system, 2,209 are condition 1, 1,670 are condition 2 and 214 are condition 3. The results of this condition assessment are summarized in the Figure 9.

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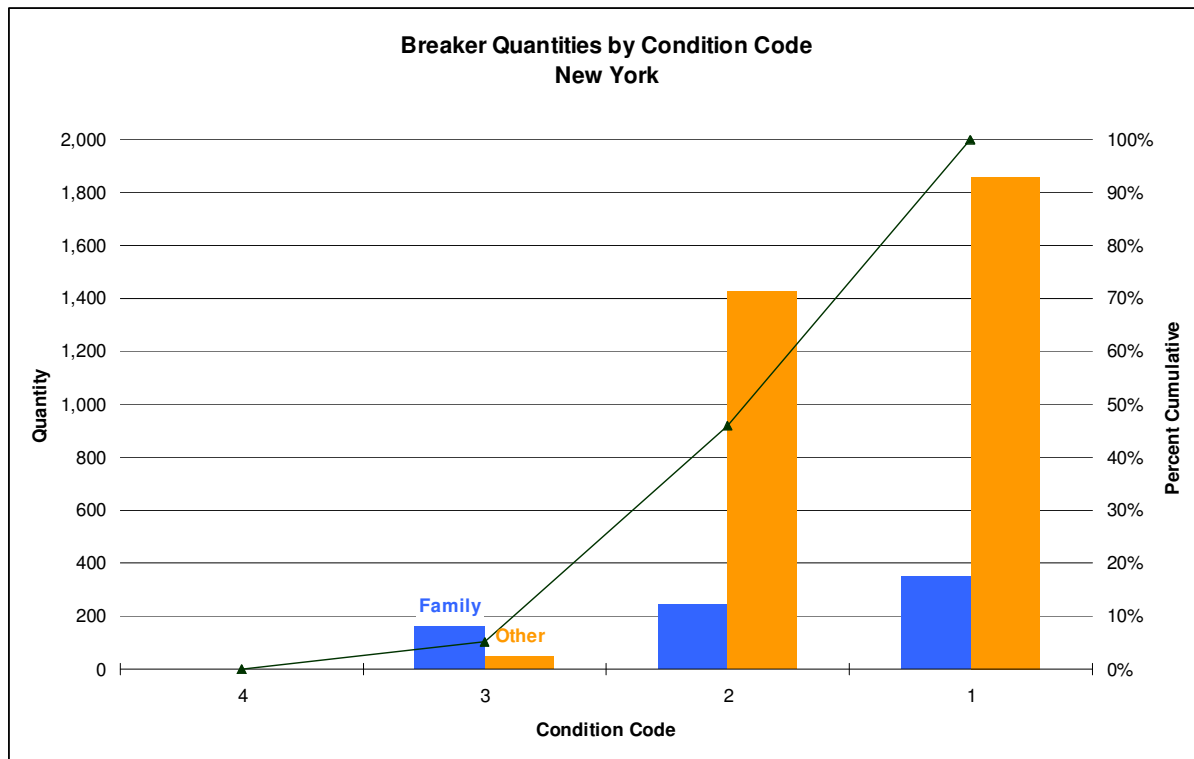


Figure 9 - New York Breaker Quantities by Condition Code

The following tables provide a high-level budget to support a ten-year plan including details for the targeted breaker families and the overall population (indoor and substation replacement locations are excluded as described in Section 4.0). The Network Asset Planning group will provide more detail for the first few years of the plan. This detail will include the specific units to be replaced and more accurate cost estimates.

New York				
Breaker Family	Number of Units*	Per Unit Cost Estimate	Time Span	Annual Cost
Condit	4		< 5 years	
FP	22		< 5 years	
GE Type AM	16		10 years	
GE Type VIR	4		< 5 years	
ITE Type HK	158		10 years	
ITE Type KS	56		5 to 10 years	
ME Type VSA	2		5 to 10 years	
WE Type DHP	101		5 to 10 years	
All Other Condition 3	43		< 5 years	
All Other Condition 2	1,139		5 to 10 years	
*A small number of these units may already be in the process of being replaced.				

Table 11 - New York Summarized Breaker Replacement Costs by Family/Condition Code

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Rearranging this information into a ten-year plan produces the following:

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 2,300,000		\$ 2,300,000
2	\$ 2,300,000		\$ 2,300,000
3	\$ 2,300,000		\$ 2,300,000
4	\$ 2,300,000		\$ 2,300,000
5		\$ 22,100,000	\$ 22,100,000
6		\$ 22,100,000	\$ 22,100,000
7		\$ 22,100,000	\$ 22,100,000
8		\$ 22,100,000	\$ 22,100,000
9		\$ 22,100,000	\$ 22,100,000
10		\$ 22,100,000	\$ 22,100,000
Total	\$ 9,200,000	\$ 132,600,000	\$ 141,800,000
At substations with a mixture of breaker conditions, all breakers should be replaced as part of the same project if change in scope is not significant. All costs in 2009 dollars without inflation.			

Table 12 - New York Estimated Ten Year Capital Plan

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Rhode Island Specifics

AIMMS has 840 operating breakers recorded, with 820 of those having an either an install or manufacture date. The age profile, Figure 10, shows that about 30% of units are greater than 50 years, with 17% at 60 years or greater. Approximately 97% of the operating breaker population is distribution assets (DxD) while 3% are transmission assets maintained by distribution (TxD). AIMMS has 37 spare breakers recorded.

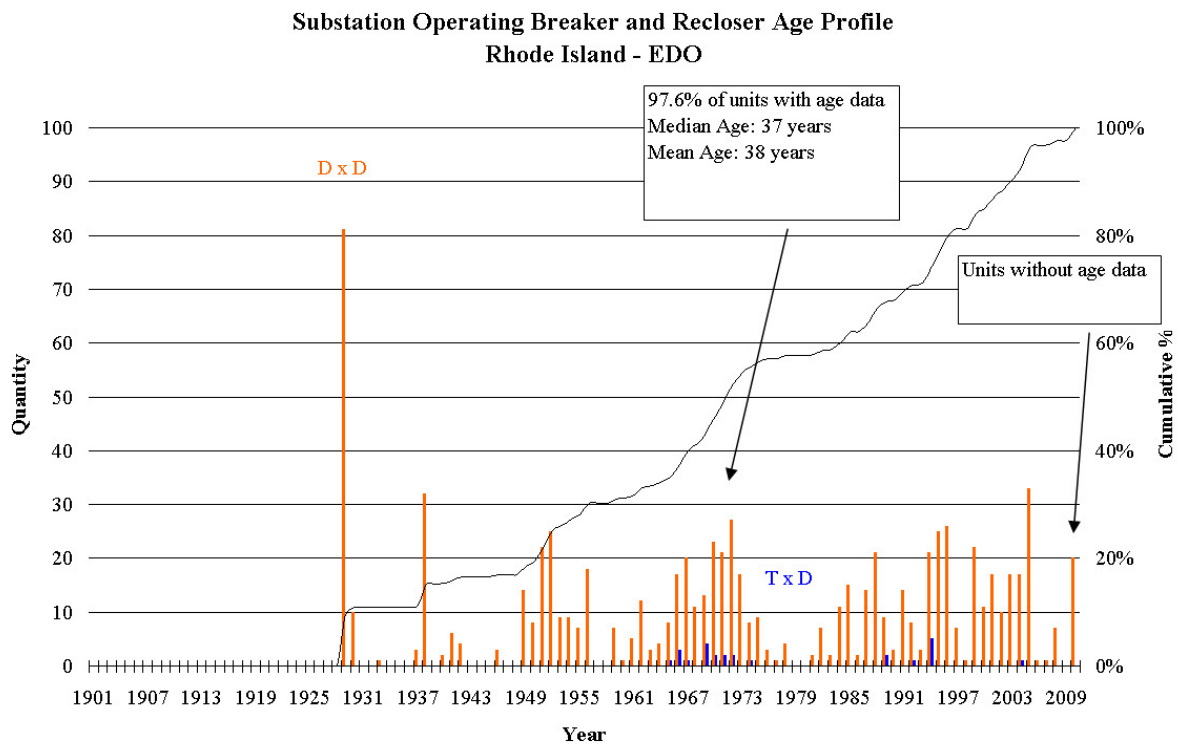


Figure 10 - Rhode Island Breaker Age Profile

Of the 840 operating breakers on the distribution system, 380 are condition 1, 156 are condition 2 and 304 are condition 3. The high percentage of condition 3 breakers is primarily associated with the aging sub-transmission system within downtown Providence. This area requires review by Network Asset Planning to determine the best course of action to address these breakers as a one-for-one replacement approach may not be the best long-term strategy. The results of this condition assessment are summarized in the Figure 11.

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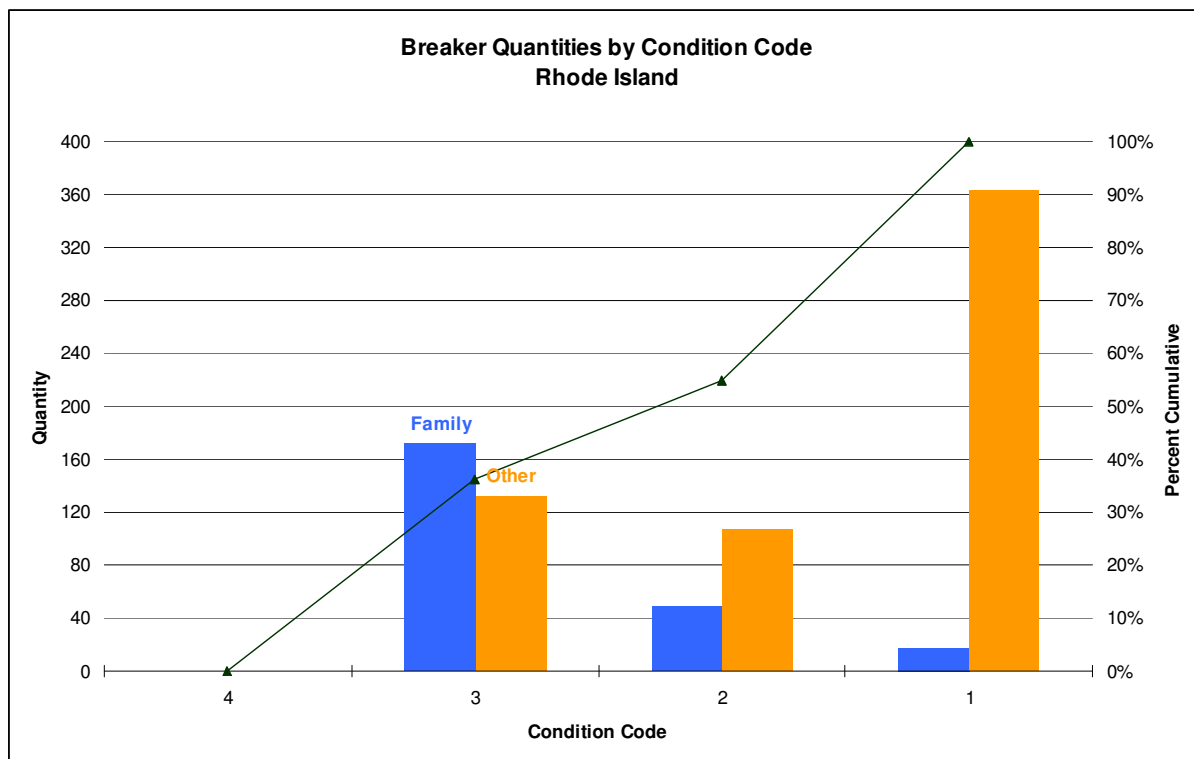


Figure 11 - Rhode Island Breaker Quantities by Condition Code

The following tables provide a high-level budget to support a ten-year plan including details for the targeted breaker families and the overall population (indoor and substation replacement locations are excluded as described in Section 4.0). More detail will be provided by the Network Asset Planning group for the first few years of the plan. This detail will include the specific units to be replaced and more accurate cost estimates.

Rhode Island				
Breaker Family	Number of Units*	Per Unit Cost Estimate	Time Span	Annual Cost
FP	5		< 5 years	
GE Type AM	53		10 years	
GE Type VIR	19		< 5 years	
ITE Type HK	20		< 5 years	
ITE Type KS	5		< 5 years	
ME Type VSA	7		5 to 10 years	
WE Type DHP	19		10 years	
All Other Condition 3	32		< 5 years	
All Other Condition 2	92		5 to 10 years	
*A small number of these units may already be in the process of being replaced. These numbers represent the upper limit of breakers to be replaced.				

Table 13 - Rhode Island Summarized Breaker Replacement Costs by Family/Condition Code

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Rearranging this information into a ten-year plan produces the following:

Estimated Ten Year Capital Costs for Breaker Strategy			
Plan Year	Condition 3 (\$)	Condition 2 (\$)	Total (\$)
1	\$ 2,100,000		\$ 2,100,000
2	\$ 2,100,000		\$ 2,100,000
3	\$ 2,100,000		\$ 2,100,000
4	\$ 2,100,000		\$ 2,100,000
5		\$ 2,000,000	\$ 2,000,000
6		\$ 2,000,000	\$ 2,000,000
7		\$ 2,000,000	\$ 2,000,000
8		\$ 2,000,000	\$ 2,000,000
9		\$ 2,000,000	\$ 2,000,000
10		\$ 2,000,000	\$ 2,000,000
Total	\$ 8,400,000	\$ 12,000,000	\$ 20,400,000
At substations with a mixture of breaker conditions, all breakers should be replaced as part of the same project if change in scope is not significant. All costs in 2009 dollars without inflation.			

Table 14 - Rhode Island Estimated Ten Year Capital Plan

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

R-III-5

Request:

For the Transformer and Related Equipment discretionary category, provide in executable format the number of transformers purchased and installed each year from FY 2015- FY 2019. Include voltage, kVA, OH/UG and cost.

Response:

For transformers purchased, please see the Excel version of Attachment R-III-5-1 and for transformers installed, please see the Excel version of Attachment R-III-5-2. The transformers installed units and costs are lower than the costs submitted in the Company's response to R-V-3 submitted in Docket No. 4783. In preparing this response, the Company performed a further review of the FY19 data, which resulted in lower units and costs.

The Narragansett Electric Company
d/b/a National Grid
In Re: Division's Review of FY 2021 Proposed Electric ISR Plan
Responses to Division's Third Set of Data Requests
Issued December 20, 2019

Attachment R-III-5

Please see also the Excel versions of Attachments R-III-5-1 and R-III-5-2

RI Electric

Transformers Purchased - FY15-FY19

<u>Transformer Category</u>	<u>KVA</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>FY2019</u>
Underground	100 kVA	9	7	7	7	24
Underground	1000 kVA	4	3	3	16	7
Underground	13.8 kVA					1
Underground	150 kVA	2	33	24	29	40
Underground	1500 kVA	2		3	10	2
Underground	167 kVA	3				
Underground	2000 kVA	2	3	5		
Underground	25 kVA	5	37	20	25	59
Underground	2500 kVA				2	
Underground	300 kVA	21	28	13	24	51
Underground	50 kVA	3	46	55	59	116
Underground	500 kVA	9	10	14	30	23
Underground	75 kVA	9	12	9	10	36
Underground	750 kVA	8	9	4	22	9
Overhead	10 kVA	25		20	85	149
Overhead	100 kVA		4	3	9	37
Overhead	167 kVA		3	2	3	17
Overhead	25 kVA	579	344	399	452	1,092
Overhead	250 kVA				6	14
Overhead	300 kVA					2
Overhead	50 kVA	1,016	296	471	525	755
Overhead	500 kVA				4	1
Grand Total		1,697	835	1,052	1,318	2,435
Cost		\$ 2,526,267	\$ 1,418,800	\$ 1,646,090	\$ 2,413,834	\$ 3,403,489

RI Electric

Transformers Installed - FY15-FY19

<u>Transformer Category</u>	<u>Nominal Voltage Class</u>	<u>KVA</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>FY2019</u>
OH	15KV	1000KVA	5	4	3	5	15
OH	15KV	100KVA	18	13	20	15	21
OH	15KV	10KVA	67	54	52	53	68
OH	15KV	1500KVA	2	2	5	3	4
OH	15KV	150KVA	24	18	35	30	31
OH	15KV	167KVA	3		5	11	10
OH	15KV	2000KVA	2	1	2	1	1
OH	15KV	2500KVA	2		3	1	
OH	15KV	250KVA		4			17
OH	15KV	25KVA	667	530	520	507	649
OH	15KV	300KVA	28	30	20	25	28
OH	15KV	500KVA	12	14	15	18	15
OH	15KV	50KVA	1,010	596	585	461	544
OH	15KV	750KVA	5	8	11	14	11
OH	15KV	75KVA	20	11	9	10	25
OH	15KV x 25KV dual ratio	15KVA	1				
OH	15KV x 35KV dual ratio	10KVA	1				
OH	15KV x 35KV dual ratio	25KVA	17	3	1	4	3
OH	15KV x 35KV dual ratio	50KVA	7				
OH	25KV	10KVA	2		1	1	37
OH	25KV	1500KVA				1	
OH	25KV	25KVA	2				
OH	25KV	500KVA	1			1	
OH	35KV	1000KVA			1		
OH	35KV	10KVA					1
OH	35KV	2000KVA	1				
OH	35KV	25KVA	8	2	1	2	7
OH	35KV	300KVA		3			
OH	35KV	50KVA	7	1	4	5	9
OH	35KV	833KVA	1				
OH	5KV	100KVA	1	1			1

RI Electric

Transformers Installed - FY15-FY19

<u>Transformer Category</u>	<u>Nominal Voltage Class</u>	<u>KVA</u>	<u>FY2015</u>	<u>FY2016</u>	<u>FY2017</u>	<u>FY2018</u>	<u>FY2019</u>
OH	5KV	10KVA	7	1	1	2	
OH	5KV	25KVA	13	19	23	16	17
OH	5KV	300KVA	1				
OH	5KV	50KVA	19	22	27	19	23
OH	5KV x 15KV dual ratio	100KVA	11	1	3	5	4
OH	5KV x 15KV dual ratio	10KVA	4	14	18	18	13
OH	5KV x 15KV dual ratio	150KVA	9	7	12	8	7
OH	5KV x 15KV dual ratio	167KVA		1			
OH	5KV x 15KV dual ratio	25KVA	81	99	149	142	212
OH	5KV x 15KV dual ratio	300KVA	2	4	16	8	6
OH	5KV x 15KV dual ratio	500KVA	2		4	4	
OH	5KV x 15KV dual ratio	50KVA	203	162	247	183	214
OH	5KV x 15KV dual ratio	750KVA			4		
OH	5KV x 15KV dual ratio	75KVA	2	1	7	4	5
UG	15KV	1000KVA			1		1
UG	15KV	500KVA		3	4	5	1
UG	15KV	750KVA	1				
UG	15KV	75KVA			1		
UG	5KV	100KVA			1		1
UG	5KV	50KVA	2	3	1		
UG	5KV x 15KV dual ratio	100KVA					1
UG	5KV x 15KV dual ratio	167KVA					1
UG	5KV x 15KV dual ratio	500KVA		1			
UG	5KV x 15KV dual ratio	50KVA	2				1
Station Service Transformer				4	1	1	2
Grand Total			2,273	1,637	1,813	1,583	2,006
Cost			\$ 2,801,938	\$ 1,795,411	\$ 2,322,672	\$ 1,902,717	\$ 2,688,057

R-III-6

Request:

Provide the most recent Area Study summary comparing status and estimated completion dates to the Company's previous version. Discuss the basis for any completion delays.

Response:

See Attachment DIV R-III-6 for the Area Study summary comparing status and estimated completion dates as provided in National Grid's Proposed FY 2021 Electric Infrastructure, Safety, and Reliability Plan, Docket No. 4995, to the Company's previous version as provided in the Company's response to PUC 1-1 in Docket No. 4915.

Area Studies include both solution identification as well as solution development and selection. Completion delays have occurred on the Blackstone Valley North/North Central Rhode Island study due to challenges experienced during solution development. The study has identified contingency loading concerns at Nasonville substation and asset condition concerns at Centerdale and West Greenville substations. High level alternatives being reviewed all include the extension of a transmission circuit and construction of a new substation. During solution development it was determined that the existing rights of way have limited clearance and feasibility concerns. This has resulted in the reevaluation of solutions including a review of new construction alternatives.

South County West and Central Rhode Island West studies had a delay in start due to resource availability. Starting in September, the Company assigned 4 new resources to the South County West, Central Rhode Island West, Tiverton, and Blackstone Valley South studies, which the Company expects will enable meeting the updated completion date.

Rank	Study Area	Load (MVA)	% State Load	# Feeders	# Stations	Annual Planning Review % Complete	Area Planning Study % Complete	Previously Provided Area Planning Study % Complete (PUC 1-1)	Area Planning Study Stage	Estimated Planning Study Complete Date	Previously Provided Planning Study Complete Date (PUC 1-1)	Expected Commencement of next Area Study
1	Providence	358	19%	95	17	100%	100%	100%	Stage 9	Complete 2017	NA	2024
2	East Bay	147	8%	22	7	100%	100%	100%	Stage 9	Complete 2015	NA	2022
3	Central Rhode Island East	204	11%	37	9	100%	100%	100%	Stage 9	Complete 2017	NA	2024
4	South County East	159	9%	22	9	100%	100%	100%	Stage 9	Complete 2018	NA	2025
5A	Blackstone Valley North	139	8%	27	6	100%	50%	50%	Stage 5	Mar-2020	Dec-2019	2026
5B	North Central Rhode Island	269	15%	35	10	100%	50%	50%	Stage 5	Mar-2020	Dec-2019	2026
6	South County West	98	5%	14	5	100%	20%	0%	Stage 3	Dec-2020	Mar-2020	2027
7	Central Rhode Island West	167	9%	33	11	100%	5%	0%	Stage 1	Dec-2020	Jun-2020	2027
8	Tiverton	28	2%	4	1	100%	5%	0%	Stage 1	Dec-2020	Dec-2020	2027
9	Blackstone Valley South	171	9%	54	11	100%	5%	0%	Stage 1	Dec-2020	Dec-2020	2027
10	Newport	105	6%	42	12	100%	0%	0%	NA	Jun-2021	Jun-2021	2020
	Totals	1845	100%	385	98	100%	60% ^[1]					

^[1] Percent of Total State Load

- Stage Description
- 1 Defining electrical and geographical scope of study and gathering necessary data needed to execute the study;
 - 2 Initial System Assessment consisting of a quick analysis of facilities and system performance within the identified study geographic and electric scope;
 - 3 Study Kick off meeting held to inform the larger stakeholder group that an area study is underway and to solicit inputs from those with knowledge of the system infrastructure in the area under review;
 - 4 Detailed System Assessment / Engineering Analysis;
 - 5 Development and Project Estimating of alternative infrastructure and non-wires alternative plans;
 - 6 Review of various alternatives with costs and identifying and finalizing a recommended plan;
 - 7 Technical Review presentation with approval committee;
 - 8 Delivery of area study report documentation upon completion of the study;
 - 9 Seek sanction of any recommended projects having forecasted spending within the next three fiscal years.

R-III-7

Request:

Regarding Company response R-I-15, the Company explains that the new Complex Capital Delivery (CCD) process requires Project Sanction after preliminary engineering has been completed, and that the old process required Project Sanction after final design was completed and final contractor bids were received. The Company further states that the new CCD process aims to reduce or eliminate partial sanctions. Please explain how the new CCD will eliminate or reduce partial sanctions when it relies on preliminary engineering estimates, which are less accurate than estimates derived from final design and contractor bids.

Response:

The purpose of the work done up until project sanction is to advance the Company's commitment to the selected option, which includes developing, planning, and scoping the project to the level needed for sanction. The next step is for the project plan to be sanctioned and approved for final design and execution. After sanction, the detailed design is completed and used for constructing the project. If, at that time, the project cost forecast exceeds the sanction tolerance of 10%, the project would be re-sanctioned.