

February 8, 2019

VIA HAND DELIVERY & ELECTRONIC MAIL

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

RE: Docket 4915 - Proposed FY 2020 Electric Infrastructure, Safety, and Reliability Plan Responses to PUC Data Requests – Set 1

Dear Ms. Massaro:

On behalf of National Grid, I have enclosed ten (10) copies of the Company's responses to the first set of data requests issued by the Rhode Island Public Utilities Commission in the above-referenced docket.

Please be advised that the Company's response to data request PUC 1-7 is pending.

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

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Enclosures

Docket 4915 Service List cc: John Bell, Division Greg Booth, Division Leo Wold, Esq. Christy Hetherington, Esq. 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

February 8, 2019 Date

Docket No. 4915 - National Grid's Electric ISR Plan FY 2020 Docket No. 4857 - Performance Incentives Pursuant to R.I.GL. §39-1 27.7.1(e)(3)

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In Re: Electric Infrastructure, Safety, and Reliability Plan FY2020 Responses to the Commission's First Set of Data Requests Issued on January 25, 2019

PUC 1-1

Request:

Refencing Chart 1 on page 33, please provide the following information:

- a. The date that the information on the chart refers to;
- b. Please update the chart;
- c. Please explain what the information in the third column titled "Load (MVA)" represents;
- d. Please provide the expected completion dates for the studies that are in progress, and the expected start and completion dates for the studies that have not commenced; and
- e. Please update the chart with an additional column showing Real Power, if known.

Response:

- a. The date that the information on the chart refers to is 2013 system peak. The reason being is that 2013 was a relatively hot summer. In comparison, the 2018 Rhode Island peak was approximately 5% below the 2013 Rhode Island peak load.
- b. Please see the updated chart based on 2018 peak loading:

Rank	Ctudy Aroo	Load	% State	#	#	Study
Kank	Study Area	(MVA)	Load	Feeders	Stations	Status
1	Providence	358	19%	95	17	100%
2	East Bay	147	8%	22	7	100%
3A	Blackstone Valley North	139	8%	27	6	50%
3B	North Central Rhode Island	269	15%	35	10	50%
4	Central Rhode Island East	204	11%	37	9	100%
5	South County East	159	9%	22	9	100%
6	Central Rhode Island West	167	9%	33	11	
7	Newport	105	6%	42	12	
8	Blackstone Valley South	171	9%	54	11	
9	Tiverton	28	2%	4	1	
10	South County West	98	5%	14	5	
	TOTALS*	1845	100%	385	98	58%

c. The information in the third column titled "Load (MVA)" represents the study area load during system peak. It is the total peak Apparent Power (measured in MVA) of all the transformers that supply load for that area. The Apparent Power of each transformer was calculated from the real time data provided by National Grid's Energy Management System (EMS).

Issued on January 25, 2019

PUC 1-1, page 2

d. Please see estimated completion date for each of the remaining Area Studies:

Study Area	Estimated Study	Estimated Study
	Start Date	Completion Date
Northwest RI (Blackstone Valley North &	November 2018	December 2019
North Central Rhode Island)		
Central RI West	May 2019	June 2020
Blackstone Valley South	November 2019	December 2020
Tiverton	November 2019	December 2020
South County West	February 2019	March 2020
Newport	May 2020	June 2021

e. The intent of providing Apparent Power in Chart 1 was to show Study Area size in relation to the total system load. This data is compiled on a yearly basis during the annual plan review and is more readily available to total and compare. Real and Reactive Power values are not compiled in the same manner. This data is typically collected during the more detailed system area study process.

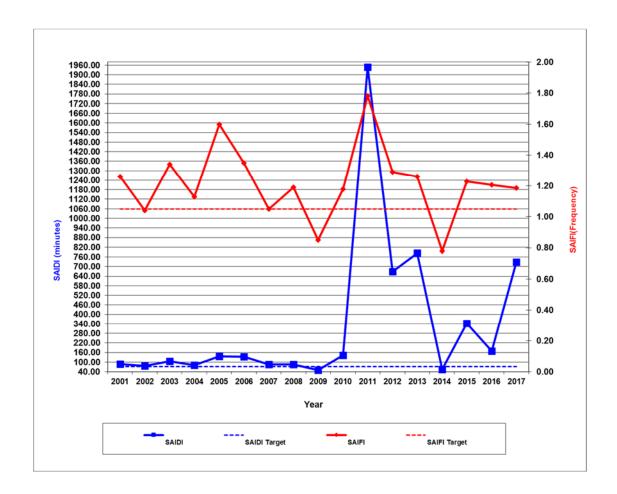
PUC 1-2

Request:

Referencing Charts 3a, 3b, 4a, and 4b on pages 40-44, please update the charts to depict CY 2018 information. Please also update Chart 3b to show all data, using axis breaks if necessary.

Response:

Service Reliability Charts 3a, 3b, 4a and 4b provided in the FY 2020 RI ISR Plan filing come from the data provided in the Company's Rhode Island Service Quality Report for CY 2017. This Service Quality Report is filed annually with the Public Utilities Commission on May 1 each year in Docket No. 3628. At this time, final data to update these charts for CY2018 will not be available until mid-April of 2019 and will be reflected in the CY 2018 Service Quality Report. An updated Chart 3b showing all access brakes is provided below.



Prepared by or under the supervision of: Patricia C. Easterly

PUC 1-3

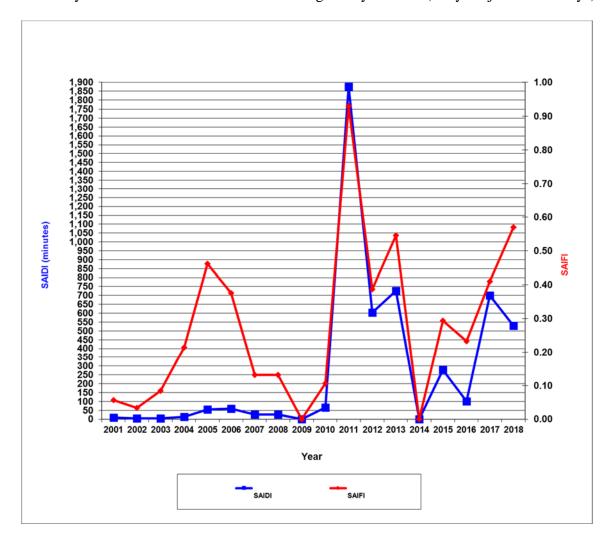
Request:

Please produce charts, similar to Charts 3a and 3b, depicting SAIDI and SAIFI for only major events for the CY 2001-2018.

Response:

Please see the chart below.

RI Reliability Performance CY2001 - CY2018 Regulatory Criteria (Only Major Events Days)



PUC 1-4

Request:

Please describe in detail the Human Machine Interface (HMI) program.

Response:

Human Machine Interface (HMI) is a technology that allows human to machine interaction with Substation devices. The original application of HMI provided summary displays, annunciation and sequence of event recordings. Subsequent generations of HMI incorporated trip/close operations, reclosing and ground trip relay operations, and electronic tagging.

Failed hardware and software components have resulted in loss of local control at substation circuit breakers, circuit switchers, and motor operated disconnects. In addition, electronic tagging cannot be performed when the HMI systems are not functioning. These HMI system component failures have the potential to prolong restoration times in the event of line outages. Compatibility issues, unsupported/outdated software, obsolete communications packages and hardware, and a decrease in HMI system knowledge have made maintenance and repair of early generation technology extremely difficult.

The program replaces or removes HMI systems at seven Company substation locations by moving high risk operational HMI functions, such as trip/close, reclosing, and tagging, to stand alone devices. At fully integrated substations, the HMI program replaces old HMI technology with touchscreen monitors connected to new communication processors. All the logic and data processing will be done in the new communication processor. For substations identified as "caps only", HMI will be removed. To compensate for the removal of the HMI, a new communication processor may be needed, and some functions will be moved to a Programmable Logic Controller (PLC) or Remote Terminal Unit (RTU).

New communication processors will be capable of supporting web-based pages for annunciation, summary displays, and sequence of events recording (SER) using Modbus over Ethernet as a communications protocol rather than Modbus Plus. Training is not required, and product familiarity is high as the replacement communications processor is one that currently is used at all new substations.

PUC 1-4, page 2

The following is a list of substations identified for HMI replacements as part of this program:

Substation	HMI Status	FY Complete
Farnum Pike	Fully Integrated	FY17
Point Street	Fully Integrated	FY20
Putnam Pike	capacitors only	FY21
Chopmist	capacitors only	FY21+
Clarkson Street	capacitors only	FY21+
Hopkins Hill	capacitors only	FY21+
West Kingston	capacitors only	FY21+

In Re: Electric Infrastructure, Safety, and Reliability Plan FY2020 Responses to the Commission's First Set of Data Requests Issued on January 25, 2019

PUC 1-5

Request:

Please provide details of the expected spending on the University Solar project.

Response:

The University Solar Project spending is based on a Project Grade Estimate. Spend profile for total costs based on Fiscal Year Spend is below:

	Prior	FY19	FY20	Total		
Spend Profile	\$ 0.018	\$ 1.600	\$ 3.877	\$ 5.495		

The cost breakdown for the overall spend is as follows:

Engineering	\$ 433,000
Materials	\$ 1,133,000
Construction	\$ 3,684,000
Oversight	\$ 245,000
Total	\$ 5,495,000

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-6

Request:

Referencing Attachment 1 on page 77, please provide details of the estimated \$4.6 million proposed budget for the line item Distributed Generation.

Response:

The Distributed Generation (DG) program is included within the Customer Requests/Public Requirements category and is considered non-discretionary as the work is done solely at the request of third parties. By its non-discretionary nature it can be highly unpredictable. In addition, the DG portfolio for a future year does not lend itself to historical trending patterns as with the other categories of the non-discretionary portfolio. Therefore, a different approach is taken to develop the DG budget. The FY 2020 budget was developed assuming most spending would be directly offset by payments received from the project owner in FY 2020 and only significant projects that were expected have costs in FY 2020, but had payments from the project owner in the previous year formed the basis of the FY 2020 budget. In addition, since study costs are funded by payments from the project owner, the estimated study costs represent placeholders for study costs not funded in FY2020.

Estimated Study Costs \$ 100,000 University Solar \$ 4,000,000 7 Mile Road \$ 575,000

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-8

Request:

Referencing Attachment 1 on page 77, please provide details of the increase of forecasted spending over budgeted for FY 2019 for the line item Transformers and Related Equipment. Please also indicate whether this increase was related to load relief or distributed generation.

Response:

The Transformers and Related Equipment category includes only one project for the purchases of line transformers (not substation) and capacitors which are pre-capitalized per accounting guidelines. At the time of purchase, the items in this project are not classified by the type of capital project where they will be installed. That classification occurs when the project is put into service.

All such costs are budgeted based on:

- 1) Prior periods usage;
- 2) Any known price changes including anticipated commodity fluctuations; and
- 3) Any expected changes in quantities for the upcoming periods.

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-9

Request:

Referencing Attachment 1 on page 77, please explain the cause of the increase in the FY 2019 spending for the line item Load Relief.

Response:

The FY 2019 Load Relief budget is \$35.8 million; the current FY 2019 forecast is \$36 million; and the FY 2018 actual Load Relief spending was \$20.7 million. The increase of \$15.1 million is principally due to the Aquidneck Island projects as more spending on those projects are in the FY2019 plan than were in the FY 2018 plan.

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-10

Request:

Referencing page 57, please explain the basis for the statement that: "[b]ecause the work in this category is unplanned by nature, the Company sets this budget based on multi-year historic trends, which have risen due to increased identification of work identified by local Operations."

Include in your answer an explanation of whether this trend is increasing because the Company is increasing its efforts to locate and identify these issues, or rather, whether the Company is continuing to inspect at the same rate but is identifying and discovering more issues, i.e., whether the Company is "looking" more or "finding" more.

Response:

The FY 2020 budget for damage & failure work is consistent with the FY 2019 budget and forecast. The costs incurred in this category are driven by either items specifically identified as Level 1 or Level 9 through the Inspection and Maintenance program or unplanned work as damaged or failed equipment is found.

PUC 1-11

Request:

Referencing the proposal to continue the expansion of the Volt/Var project, please detail and describe the Company's expected spending for FY 2020. Please include in your answer:

- a. the number of feeders the Company expects to address in this expansion;
- b. please provide a copy of any plan or forecast that the Company has to continue this expansion in future years.

Response:

- a. The Company expects to finish the six Washington Avenue Substation feeders and start four feeders originating from the Dexter Street Substation and three feeders originating from the Woonsocket Substation in FY 2020. A total of thirteen feeders will be worked on within FY 2020.
- b. The Company's current plan is based on its initial Volt/Var analysis and ends in FY 2022. In FY 2021, the Company expects to propose funding of approximately \$2.2 million for the completion of the Dexter and Woonsocket feeders and the start of work on the Pontiac and Farnum Pike feeders. Completion of the Volt/Var work on the Pontiac and Farnum Pike feeders could extend into FY 2022.

During FY 2020, the Company plans to conduct a second Volt/Var analysis to develop a strategy and program for wider scale deployment. The program would be documented, communicated, and executed in a manner similar to other programs. The program development would be aligned with the Company's Grid Modernization Plan, which is in development and will be filed with the Public Utilities Commission during FY 2020.

PUC 1-12

Request:

Please explain how the requested funding for the EMS/RTU (SCADA) program relates to the DSCADA, ADMS, and RTU Separation programs in Dockets 4770/4780. Include in your answer whether the requested funding is incremental to current funding.

Response:

The requested funding for the EMS/RTU program does not overlap with the DSCADA, ADMS, and RTU Separation programs that were reviewed by the Public Utilities Commission (PUC) in Docket Nos. 4770/4780. The requested funding is incremental to current funding approved by the PUC in Docket Nos. 4770/4780.

The goal of EMS/RTU program, detailed in Docket Nos. 4770/4780, is to provide EMS functionality at particular Narragansett Electric Substations. The scope of work contained within this program consists of installation and removal of substation and communication equipment to bring control and data acquisition capability back to the Company's Control Center. The Remote Terminal Unit (RTU) is a piece of substation equipment that is part of a chain of equipment required to provide EMS functionality. Specifically, the RTU gathers control and communication signals from a variety of Transmission and Distribution (T and D) substation equipment and funnels them through the main communication path back to the Control Center. The scope of work within the EMS/RTU program could be an installation or a replacement of the RTU.

The goal of the RTU Separation program, detailed in Docket Nos. 4770/4780, is required to separate T and D Supervisory Control and Data Acquisition (SCADA) systems to enable a modern grid. Presently, National Grid operates a single combined T and D SCADA system. The RTU separation program is a supporting effort for the Distribution Supervisory Control and Data Acquisition (DSCADA) system. In the recent past, if a RTU was installed or replaced under the EMS program, it was setup to be easily separated into T and D RTUs by reconfiguration and separating the data into transmission level and distribution level data. The Company plans on maintaining this practice to preserve efficiency.

When the Company developed the RTU Separation program in Docket Nos. 4770/4780, it considered these easier and lower cost separation jobs in the total cost. The following table illustrates the RTU Separation program options depending on the current RTU status at a particular station:

PUC 1-12, page 2

RTU Status at a Substation	RTU Separation Program
No RTU	Not Applicable
Combined T and D substation	Replace RTU and separate data into
with Older RTU	T and D groups
Combined T and D substation	Minimal hardware changes required,
with Newer RTU	separate data into T and D groups
New and separated RTU	Not Applicable
Transmission or Distribution	Not Applicable
Specific Substations	

The goals of the DSCADA and ADMS efforts, detailed in Docket Nos. 4770/4780, are to establish new functionality across the distribution electric system. This will be done through the installation of equipment and software located at the Company's Control Center and to a lesser extent equipment on distribution lines.

Although all of the programs are related to controlling and collecting data on a distribution electric system, they vary in location and scope such that there is no overlap in funding.

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-13

Request:

Referencing pages 52-55, has the recent corporate restructuring resulted in any change to the process utilized to develop the annual work plan? If yes, please explain.

Response:

No, the process to develop the annual plan for the FY 2020 Electric Infrastructure, Safety, and Reliability (ISR) Plan was the same as the process used to develop the annual plan for the FY 2019 Electric ISR Plan.

In addition, the same employees who execute and deliver the annual work plan for the FY 2020 Electric ISR Plan (once it is approved by the Public Utilities Commission) are the same employees who executed and delivered the annual work plan for the approved FY 2019 Electric ISR Plan. Under the recent corporate restructuring, employees in the New England Electric Field Operations department are now part of the Electric Business Unit (EBU) (previously, this department reported to the Rhode Island Jurisdiction). The EBU is accountable to the Rhode Island Jurisdiction to deliver their part of the annual work plan for the FY 2020 Electric ISR Plan.

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020 Responses to the Commission's First Set of Data Requests Issued January 25, 2019

PUC 1-14

Request:

Please provide any documentation, data, and/or methodologies used to develop forecasted spending such as customer requests/public requirements and fixing damaged or failed equipment.

Response:

Please refer to Attachment PUC 1-14 as an example of documentation used to develop forecasted ISR spending for Customer Requests/Public Requirements and Damage/Failure.

Projects within the Customer Requests/Public Requirement and Damage/Failure spending rationales mostly emerge during the year and are, therefore, not defined prior to the start of the fiscal year. When developing the upcoming fiscal year's budget/forecasted spend, the Company reviews historic spending trends and adjusts for any future expectations. To accomplish this, the Company begins its forecast by calculating Moving Annual Total (MAT) spending trends. MATs are defined as the previous 12-month spending total at the end of a given month. Using MATs removes seasonality or one-month outliers that may arise if the Company were to review singular month spending trends. Spending is then adjusted to remove outlier projects, add future known items, or make one-time adjustments to keep the spending profile to a "base" spending pattern as shown in Column I of Attachment PUC 1-14. MAT spending for mandatory budget classifications are reviewed in two sections: Blanket projects and Reserves for specific projects. Blanket project spending is further adjusted for known or expected changes in inflation projections, high level national economic projections, material and labor rates as shown in Columns S, T, U and V of Attachment PUC 1-14. The resulting forecasted spend included in the FY2020 ISR Plan is recorded in Column D of Attachment PUC 1-14.

In Re: Electric Infrastructure, Safety, and Reliability Plan for FY2020

Attachment PUC 1-14

Page 1 of 1

Line #	PowerPlant Project #	Project Description	FY2020 Budget (capital)	FY2021 Budget (capital)	FY2022 Budget (capital)	FY2023 Budget (capital)	FY2024 Budget (capital)	Forecast Base (\$000) - NO CIACS	CIAC Estimate (\$\$)	Other Estimate (\$\$) when negative (prob CIAC)	Payroll & Related Overheads %	Materials %	Indirects %	Other % (when positive)	Purchased Services %	Transportation %	OK if 100%	Inflation	Economic Increase (where applicable)	Wage & Benefits Increase %	Materials Cost Increase %	Cap-Related Expense %	Cost of Removal %
Column A	Column B	Column C	Column D	Column E	Column F	Column G	Column H	Column I	Column J	Column K	Column L	Column M	Column N	Column O	Column P	Column Q	Column R	Column S	Column T	Column U	Column V	Column W	Column X
1	CN04904	NARRAGANSETT METER PURCHASES	\$1,621,000	\$1,679,000	\$1,739,000	\$1,801,000	\$1,865,000	\$1,565,000	\$0	\$0	7%	83%	10%	0%	0%	0%	100%	2.0%	1.5%	2.5%	2.0%	0.0%	0.0%
2	CN04920	NARRAGANSETT TRANSFORMER PURCHASES	\$3,516,000	\$3,640,000	\$3,768,000	\$3,901,000	\$4,039,000	\$3,445,000	(\$50,000)	\$0	0%	87%	13%	0%	0%	0%	100%	2.0%	1.5%	2.5%	2.0%	0.0%	0.0%
3	COS0002	OCEAN ST-DIST-SUBS BLANKET	\$705,000	\$720,000	\$736,000	\$752,000	\$769,000	\$690,000	\$0	\$0	39%	25%	12%	0%	20%	4%	100%	2.0%		2.5%	2.0%		
4	COS0004	OCEAN ST-DIST-METER BLANKET	\$909,000	\$945,000	\$982,000	\$1,021,000	\$1,061,000	\$875,000	\$0	\$0	79%	0%	11%	0%	0%	10%	100%	2.0%	1.5%	2.5%	2.0%	5.0%	3.0%
5	COS0010	OCEAN ST-DIST-NEW BUS-RESID BLANKET	\$5,308,000	\$5,512,000	\$5,724,000	\$5,944,000	\$6,173,000	\$5,600,000	(\$250,000)	(\$250,000)	63%	9%	12%	0%	5%	12%	100%	2.0%	1.5%	2.5%	2.0%	8.0%	30.0%
6	COS0011	OCEAN ST-DIST-NEW BUS-COMM BLANKET	\$4,582,000	\$4,757,000	\$4,939,000	\$5,128,000	\$5,324,000	\$6,075,000	(\$1,400,000)	(\$300,000)	58%	14%	10%	0%	7%	12%	100%	2.0%	1.5%	2.5%	2.0%	15.0%	18.0%
7	COS0012	OCEAN ST-DIST-ST LIGHT BLANKET	\$150,000	\$153,000	\$156,000	\$159,000	\$163,000	\$147,000	\$0	\$0	48%	20%	10%	0%	14%	8%	100%	2.0%		2.5%	2.0%	12.0%	15.0%
8	COS0013	OCEAN ST-DIST-PUBLIC REQUIRE BLANKT	\$833,000	\$865,000	\$898,000	\$932,000	\$967,000	\$925,000	(\$125,000)	\$0	54%	11%	11%	0%	14%	11%	100%	2.0%	1.5%	2.5%	2.0%	20.0%	25.0%
9	COS0014	OCEAN ST-DIST-DAMAGE&FAILURE BLANKT	\$10,330,000	\$10,562,000	\$10,800,000	\$11,043,000	\$11,291,000	\$12,450,000	(\$2,400,000)	\$0	50%	13%	10%	1%	17%	9%	100%	2.0%		2.5%	2.0%	19.0%	20.0%
10	COS0022	OCEAN ST-DIST-3RD PARTY ATTCH BLNKT	\$162,000	\$166,000	\$170,000	\$174,000	\$178,000	\$305,000	\$0	(\$150,000)	57%	8%	10%	0%	18%	7%	100%	2.0%		2.5%	2.0%	5.0%	5.0%
11	COS0091	LAND AND LAND RIGHTS RI ELECT	\$429,000	\$438,000	\$448,000	\$458,000	\$468,000	\$420,000	\$0	\$0	42%	0%	10%	5%	44%	0%	100%	2.0%		2.5%	2.0%	0.0%	0.0%