STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

The Narragansett Electric Company
d/b/a National Grid

Docket No. 4915

RE: FY 2020 Electric Infrastructure,
Safety, and Reliability Plan

PREFILED DIRECT TESTIMONY OF

Gregory L. Booth, PE
President, PowerServices, Inc.
On Behalf of Rhode Island Division of Public Utilities and Carriers

February 20, 2019

Prepared by:
Gregory L. Booth, PE
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Prefiled Direct Testimony of

Gregory L. Booth, PE, President
PowerServices, Inc.

On Behalf of Rhode Island Division of Public Utilities and Carriers
Docket No. 4783

Table of Contents

DIRECT TESTIMONY OF GREGORY L. BOOTH, PE

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND THE BUSINESS ADDRESS OF YOUR EMPLOYER.

A. My name is Gregory L. Booth. I am employed by PowerServices, Inc. ("PowerServices"), located at 1616 E. Millbrook Road, Suite 210, Raleigh, North Carolina 27609.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS MATTER?

A. I am testifying on behalf of the Rhode Island Division of Public Utilities and Carriers ("Division").

Q. WHAT DOES YOUR POSITION WITH POWERSERVICES, INC., ENTAIL?

A. As President of PowerServices, Inc., an engineering and management services firm, I am responsible for the direction, supervision, and preparation of engineering projects and management services for our clients, including the corporate involvement in engineering, planning, design, construction management, and testimony.

Q. WOULD YOU PLEASE OUTLINE YOUR EDUCATIONAL BACKGROUND?

A. I graduated from North Carolina State University in Raleigh, North Carolina in 1969 with a Bachelor of Science Degree in Electrical Engineering, and was inducted into the North Carolina State University Department of Electrical and Computer Engineering Alumni Hall of Fame in November 2016. I am a registered professional engineer in twenty-three (23) states, including Rhode Island, as well as the District of Columbia. I am a registered land surveyor in North Carolina. I am also registered under the National Council of Examiners for Engineering and Surveying.

Q. ARE YOU A MEMBER OF ANY PROFESSIONAL SOCIETIES?

A. I am an active member of the National Society of Professional Engineers ("NSPE"), the Professional Engineers of North Carolina ("PENC"), the Institute of Electrical and Electronics Engineers ("IEEE"), American Public Power Association ("APPA"), American Standards and Testing Materials Association ("ASTM"), the National Fire Protection Association ("NFPA"), and Professional Engineers in Private Practice ("PEPP"). I have also served as a member of the IEEE Distribution Subcommittee on Reliability and as an advisory member of the National Rural Electric Cooperative Association ("NRECA")-Cooperative Research Network, which is an organization similar to EPRI.

Q. PLEASE BRIEFLY DESCRIBE YOUR EXPERIENCE WITH ELECTRIC UTILITIES.

A. I have worked in the area of electric utility and telecommunication engineering and management services since 1963. I have been actively involved in all aspects of electric utility planning, design and construction, including generation and transmission systems, and North American Electric Reliability Corporation ("NERC") compliance.

Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT BEFORE THE RHODE ISLAND PUBLIC UTILITIES COMMISSION?

A. Yes. I have testified before the Rhode Island Public Utilities Commission on numerous matters, including Docket Nos. 2489, 2509, 2930, 3564, 3732, 4029, 4218, 4237, 4307, 4360, 4382, 4770/4780, 4473, 4483, 4513, 4539, 4592, 4614, 4682, 4783, D-11-94, and D-17-45. My testimony in Rhode Island has included filed and live testimony on previous Electric Infrastructure, Safety and Reliability Plan Fiscal Year Proposal filings by National Grid in Docket Nos. 4218, 4307, 4382, 4473, 4539, 4592, 4682, and 4783.

Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT IN OTHER JURISDICTIONS?

A. I have testified before the FERC and numerous state commissions, including in Connecticut, Delaware, Florida, Maine, Maryland, Massachusetts, Minnesota, New Jersey, North Carolina, Pennsylvania, and Virginia.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?

A. The purpose of my testimony is to introduce *Exhibit GLB-1*, Report of Gregory L. Booth, PE on the review of National Grid's Proposed FY 2020 Electric Infrastructure, Safety and Reliability Plan provided to the Division October 4, 2018 ("ISR Plan"). My testimony will briefly summarize the collaborative process between the Division and National Grid, which resulted in preliminary consensus of the final Electric Infrastructure, Safety, and Reliability Plan FY 2020 Proposal filed with the Commission by National Grid on December 21, 2018. My testimony also summarizes the details of *Exhibit GLB-1* and my recommendations.

III. ISR PLAN EVALUATION PROCESS

Q. WOULD YOU BRIEFLY OUTLINE THE PROCESS WHICH LEADS TO THE DIVISION'S SUPPORT OF THE NATIONAL GRID ISR PLAN FILED ON DECEMBER 21, 2018 IN THIS DOCKET?

A. Yes. An evaluation and analysis process was performed, including the following actions and procedures:

- On February 13 - 15, 2018, National Grid provided a presentation of the South County East Area Study plan review and associated engineering models and tables.
- On March 23, 2018, PowerServices and the Division provided the first set of South County East Area Study informal data requests to National Grid.
- On April 30, 2018, National Grid responded to the first set of South County East Area Study informal data requests and requests a date to schedule a follow-up web conference.
- On May 4, 2018, The Division informed National Grid that the Area Study review will be deferred due to the resources required for the Company's rate case.
- On June 28, 2018, PowerServices provided a second set of South County East Area Study informal data requests to National Grid.
- On July 18, 2018, National Grid provided responses to the second set of South County East Area Study informal data requests.
- On July 20, 2018, National Grid hosted a meeting and web conference to review the Company's South County East Area Study with the Division and PowerServices.
- On July 23, 2018, National Grid hosted a web conference for the Division and PowerServices to discuss NWA analysis, documentation, and status of current efforts.
- On August 3, 2018, National Grid provided its ISR FY 2020 ISR Proposal Pre-filing Planning Information to the Division and PowerServices.
- An August 9, 2018 meeting was held between the Division, PowerServices and the Company, to discuss the Pre-filing Planning Information and reports provided by National Grid in advance of the FY 2020 ISR Plan filing;
- On October 4, 2018, National Grid filed its initial proposed FY 2020 Electric Infrastructure, Safety, and Reliability Plan ("Electric ISR Plan" or "ISR Plan").
- On October 16, 2018, PowerServices participated in NWA quarterly meeting hosted by National Grid.

- On October 22, 2018, National Grid, the Division, and PowerServices held a conference call to review the proposed FY 2020 ISR Plan.

- On October 26, 2018, National Grid provided informal responses to discussion points from the October 22, 2018 meeting.

- On November 1, 2018, PowerServices provided the First Set of Data Requests to the Company.

- Between November 16, 2018 and November 30, 2018, National Grid provided responses to the First Set of Data Requests on a rolling basis.

- On December 5, 2018, PowerServices provided the Second Set of Data Requests to the Company.

- On December 7, 2018, the Division and PowerServices provided the Company with proposed budget adjustments in preparation for an upcoming conference call.

- On December 12, 2018, National Grid, the Division and PowerServices held a conference call to review proposed adjustments to the FY 2020 ISR Plan. Detailed discussions addressed areas which included distribution meters under the customer requirements spending category, URD cable replacement, Asset Replacement, I&M budget and repair cycle, Damage/Failure non-discretionary work, the Westerly Flood Project, and a newly proposed Storm Hardening project planned for Anthony Road.

- On December 14, 2018, National Grid, the Division and PowerServices held a conference call to continue discussions on proposed areas of adjustment. PowerServices proposed initial adjustments to several components of the FY 2020 ISR Plan. The Company provided additional detailed information regarding its distribution meter replacement strategy and proposed supplemental adjustments.

- Between December 14, 2018 and December 19, 2018, National Grid provided responses to the Second Set of Data Requests in addition to data and information as a follow up to the December 14, 2018 conference call.

- On December 19, 2018, PowerServices provided the Third Set of Data Requests to the Company.

- On December 21, 2018, National Grid, the Division and PowerServices held a conference call to finalize adjustments. Consensus was reached and the Company filed its Electric Infrastructure, Safety, and Reliability Plan FY 2020 Proposal, which included budget adjustments resulting from discussions with PowerServices and the Division.

- On January 9, 2019, National Grid provided responses to the Third Set of Data Requests.

- On February 6, 2019, PowerServices provided the Fourth Set of Data Requests to the Company.

- On February 11, 2019, PowerServices provided the Fifth Set of Data Requests to the Company.

The following charts summarize the adjustments by category and the preliminary agreement reached between the Division and National Grid, which are represented in National Grid's December 21, 2018 filing:

PROPOSED BUDGET by Spending Rationale	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)	% of Total Budget
Customer Request/Public Requirements	$ 27,775,000	$ (750,000)	$ 27,025,000	27%
Damage/Failure Total	$ 13,505,000	$ -	$ 13,505,000	13%
Subtotal	***$ 41,280,000***	***$ (750,000)***	***$ 40,530,000***	***40%***
Asset Condition	$ 43,825,000	$ (4,150,000)	$ 39,675,000	39%
Non-Infrastructure	$ 550,000		$ 550,000	1%
System Capacity and Performance	$ 22,145,000	$ (1,100,000)	$ 21,045,000	21%
Subtotal	***$ 66,520,000***	***$ (5,250,000)***	***$ 61,270,000***	***60%***
Grand Total	**$ 107,800,000**	**$ (6,000,000)**	**$ 101,800,000**	

FY 2020 Proposed Budget	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)
Vegetation Management			
Cycle Pruning	$ 5,600,000	$ -	$ 5,600,000
Hazard Tree	$ 2,250,000		$ 2,250,000
Sub-T	$ 500,000		$ 500,000
Police/Flagman Detail	$ 825,000		$ 825,000
All Other Activities	$ 1,225,000		$ 1,225,000
Program Total	**$ 10,400,000**	**$ -**	**$ 10,400,000**

IV. REPORT SUMMARY

Q. PLEASE BRIEFLY SUMMARIZE YOUR REPORT ATTACHED AS *EXHIBIT GLB-1*.

A. The report contains an Introduction describing the overall process and summarizing the adjustments, which resulted in a preliminary consensus for the FY 2020 ISR Plan Proposed Budget of $101.8 million for capital items, and proposed Vegetation Management Program expense budget of $10.4 million. The *Exhibit GLB-1* report section on the Capital Investment Plan discusses in detail each major category: Customer Request/Public Requirements; Damage/Failure; Asset Condition; Non-Infrastructure; and System Capacity and Performance, outlining the issues considered, the adjustments proposed, and the reasoning for the adjustments as accepted by National Grid. A detailed summary chart contained in *Exhibit GLB-1* as Appendix-2 shows each Spending Rationale and Budget Class with the October 4, 2018 initial proposed budget, net adjustments, preliminary budget, and the December 21, 2018 Filed Proposed Budget.

The report contains a conclusion which addresses the FY 2020 ISR Plan Proposal Budget as filed by National Grid on December 21, 2018. The conclusion includes twelve (12) recommendations related to the capital investment, O&M, and vegetation management portions of the ISR Plan. Many of these recommendations are a continuation of previous ISR Plan recommendations. Emphasis remains on the need for the Company to complete all Area Studies to create a single Long Range Plan that supports major System Capacity and Asset Condition projects. These studies should take into account robust evaluation metrics that include NWA where applicable In addition, there is a continued need to develop an alignment between ISR Plan core programs and those arising from external

initiatives as the Company, Commission Staff, Division, and stakeholders work to develop a more holistic, transparent, and forward-looking planning process. Finally, I include an additional recommendation for the Company and Division to address potential overlap between non-discretionary spend in the Damage/Failure category, and discretionary spend in the Inspection & Maintenance program.

V. CONCLUSION

Q. DO YOU AND THE DIVISION SUPPORT THE NATIONAL GRID FY 2020 ELECTRIC ISR PLAN PROPOSAL FOR $101.8 MILLION IN BUDGETED CAPITAL EXPENDITURES, WITH $10.4 MILLION IN VEGETATION MANAGEMENT EXPENSES AND $1.2 MILLION IN INSPECTION AND MAINTENANCE EXPENSES?

A. Preliminary agreement was reached on several cost components, but the Division reserved its right for additional adjustments or conditions pending further evaluation. A six percent (6%) decrease in the Company's initially proposed capital budget was proposed.

Q. WHAT ARE THE RECOMMENDATIONS YOU HAVE MADE IN YOUR REPORT *EXHIBIT GLB-1*?

A. The twelve (12) recommendations related to capital investment and vegetation management I have provided in my *Exhibit GLB-1* report are summarized in the following list, and are provided with additional discussion in the Summary and Recommendations section of my report.

1. National Grid and the Division shall consider a method to combine and manage a discretionary budget for repairs completed in the Damage/Failure and I&M categories separately from a budget required to replace failed equipment in the non-discretionary category. The Company's proposed FY 2021 ISR Plan should include budget categories, rationale, and proposed spend that reflect a consensus methodology.

2. National Grid shall develop an alignment between various planning and project evaluation processes, with consideration as to how a grid modernization strategy may be incorporated. This includes, but is not limited to, the SRP, Area Studies, ISR Plan, NWA options and internal Design Criteria.

3. National Grid shall propose a methodology to revise current and future study documents supporting Asset Replacement and System Capacity programs or projects as applicable to include, at minimum:

- The traditional elements included in the Company's current studies including, but not limited to, purpose and problem statement, scope and program description, condition assessment/criticality rankings, alternatives considered, solution, cost and timeline.
- Discussion on the impact to related Company initiatives, Commission programs, the various pilot projects, or other requirements driven by SRP, DSP, Heat Maps, and emerging initiatives.
- A detailed comparison of recommendations to Area Studies to determine if solutions are aligned with study outcomes, noting adjustments required to avoid redundancy in planning.
- An evaluation of potential incremental investments that support the Company's long term grid modernization strategy. This includes description of technology or infrastructure investment, cost benefit to traditional safety and reliability objectives, and additional operational benefits achieved if implemented.
- A robust NWA evaluation for projects passing initial screening that clearly identifies alternatives considered, costs, and benefits.

4. National Grid shall continue to develop a System Capacity Load Study and a 10-year Long Range Plan in order to increase the level of support and transparency for the capital budget. The Company shall submit and present the outcome of Area Studies to the Division and its consultant at the time of completion. These studies shall include a separate Non-Wire Alternative analysis of the projects consistent with the requirements of other program commitments. The Company shall submit a report with updates on modeling activities and Area Study status at least 120 days prior to filing its FY 2021 ISR Plan Proposal, but in any event no later than August 31, 2019.

5. National Grid shall manage major Asset Replacement and System Capacity & Performance project budgets separate from other discretionary projects, such that any budget variances (underspend) will not be utilized in other areas of the ISR Plan. The Company shall provide quarterly budget and project management reports.

6. National Grid will continue to manage (underspend/overspend management) individual project costs within the ISR Plan discretionary category (comprised of Asset Condition and System Capacity and Performance projects), such that total portfolio costs are aligned within a discretionary budget target that excludes major substation projects.

7. National Grid shall continue to provide quarterly reporting on Damage/Failure expenditures to include the details of completed projects by operating region. The

Company will separately identify Level I projects repaired as a result of the I&M program.

8. National Grid shall continue to provide a detailed budget for System Capacity & Performance and Asset Condition in order to provide transparency on a project level basis for the current and future 4-year period. The budget shall be provided in advance of the FY 2021 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

9. National Grid shall submit an evaluation of future proposed Asset Condition projects as compared to the Company's Long Range Plan in advance of the FY 2020 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

10. National Grid shall continue to submit its detailed substation capacity expansion plans and load projections, and include an evaluation of proposed projects against the Company's Long Range Plan, in advance of the FY 2021 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

11. National Grid shall continue to submit a cost-benefit analysis on the Vegetation Management Cycle Clearing Program and a separate cost-benefit analysis on the Enhanced Hazard Tree Management program for the Division's review prior to submitting the Company's FY 2021 ISR Plan Proposal, but in any event no later than August 31, 2019.

12. National Grid shall continue to submit its Metal-Clad Switchgear replacement program cost-benefit analysis to the Division prior to submitting the Company's FY 2021 ISR Plan Proposal to the extent any Metal-Clad Switchgear replacements or major upgrades are proposed, but in any event no later than August 31, 2019.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

AFFIDAVIT OF GREGORY L. BOOTH, PE

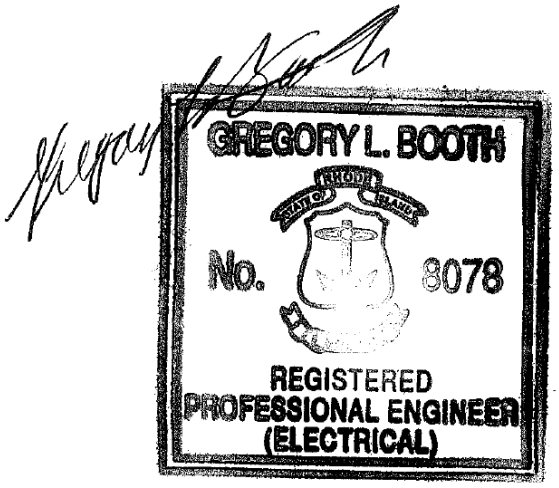
Gregory L. Booth, does hereby depose and say as follows:

I, Gregory L. Booth, on behalf of the Rhode Island Division of Public Utilities and Carriers, certify that testimony, including information responses, which bear my name was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the penalties of perjury this the 19th day of February, 2019.

Gregory L. Booth

I hereby certify this document was prepared by me or under my direct supervision. I also certify I am a duly registered professional engineer under the laws of the State of Rhode Island, Registration No. 8078.



Gregory L. Booth, PE

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

REPORT OF

Gregory L. Booth, PE, President
PowerServices, Inc. d/b/a PowerServices and Consulting, Inc.
On Behalf of Rhode Island Division of Public Utilities and Carriers
Concerning
The Narragansett Electric Company d/b/a National Grid's Proposed
FY 2020 Electric Infrastructure, Safety, and Reliability Plan
Docket No. 4915

February 20, 2019

Prepared By:
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PREFACE

PowerServices, Inc. was engaged by the State of Rhode Island Division of Public Utilities and Carriers ("RIDPUC") to evaluate the Electric Infrastructure, Safety and Reliability ("ISR Plan" or "Plan") Plan FY 2020 Proposal submitted by National Grid. As part of the review of the plan, numerous data requests were submitted and responses provided by National Grid. Additionally, meetings and conferences were held with National Grid and their key personnel involved in the development of the Plan. The Legislative Act amending Chapter 39-1 "Revenue decoupling", 39-1-27.7.1, provided National Grid the right to file an ISR Plan and receive considerations for the Plan. The statute provides for evaluation by the Division, and for National Grid and the Division to attempt to reach an agreement on a proposed plan and submit a mutually agreed upon Plan. The following report describes the process and position reached between the Division and National Grid.

REPORT OF

Gregory L. Booth, PE, President
PowerServices, Inc. d/b/a PowerServices and Consulting, Inc.
On Behalf of Rhode Island Division of Public Utilities and Carriers
Concerning
The Narragansett Electric Company d/b/a National Grid's Proposed
FY 2020 Electric Infrastructure, Safety, and Reliability Plan
Docket No. 4915

Table of Contents

I. INTRODUCTION

PowerServices, Inc. ("PowerServices"[1]) was engaged by the Rhode Island Division of Public Utilities and Carriers ("Division") to assist in the evaluation of the initial National Grid Electric Infrastructure, Safety, and Reliability Plan FY 2020 Proposal (the "ISR Plan" or "Plan") dated October 4, 2018, and the final Electric Infrastructure, Safety, and Reliability Plan FY 2020 Proposal dated December 21, 2018 and filed in Docket 4915. The evaluation followed the same process of analysis completed for each ISR Plan filed from FY 2012 through FY 2019. This Report will include an explanation of the process for the initial FY 2020 ISR Plan proposal evaluations and collaborative efforts, resulting in a preliminary reduction of proposed FY 2020 capital spending in several areas, including Customer Request/Public Requirements, capital expenses for asset replacement and load relief projects, and for a newly proposed advanced metering infrastructure pilot project. The reductions were applied to the proposed spending levels initially presented as part of the Company's pre-file documents on August 3, 2018, further revised in the Company's initial FY 2020 ISR Plan Proposal submitted to the Division October 4, 2018, and are finalized in the subsequent ISR Plan Proposal dated December 21, 2018.

This process, as provided for in Chapter 39-1-27.7.1 of the General Laws entitled "Revenue Decoupling", is for the Company, prior to the start of each fiscal year, to submit its ISR spending plan and consult with the Division regarding said Plan. The Division is also bound by statute to "cooperate in good faith to reach an agreement on a proposed plan." Through this process the Division and the Company ultimately reached agreement on select adjustments. In this report, I will discuss the areas of consensus between the Division and the Company. This includes an in

[1] For the purposes of this report, reference to "PowerServices", "I", and "my" are interchangeable.

depth assessment of the Company's justification for traditional components included in the Plan including major projects compelled by Area Studies. I also address the Company's actions taken outside the ISR Plan process to achieve a more holistic planning process, taking into account multiple external initiatives, and their associated steps to apply Docket 4600 Goals to new ISR projects and programs for which it seeks funding for the first time.

The Company's initial proposed October 4, 2018 FY 2020 ISR Plan followed very closely the format and principals agreed to in previous Plans. Most of the Company's budget line items were structurally similar to the previous Plans with modifications in the cost structure. PowerServices performed its evaluations by reviewing the Company's pre-file planning information, along with the proposed ISR Plan. The pre-file planning information is guided by Division recommendations, and the Rhode Island Public Utilities Commission ("Commission") Report and Order from prior ISR proceedings. The materials evaluated included reliability reports, budget variance explanations, program cost benefit analysis, detailed budgets for major projects, completed Area Studies, and other supplemental information. The Company's quarterly updates for the FY 2019 ISR Plan were also utilized to provide trending analysis and benchmarks for proposed levels of spending. An in-depth analysis of the pre-file planning information and each component of the proposed FY 2020 ISR Plan was undertaken. The evaluation and analysis process was performed, including the following actions and procedures:

1. On February 13 - 15, 2018, National Grid provided a presentation of the South County East Area Study plan review and associated engineering models and tables.
2. On March 23, 2018, PowerServices and the Division provided the first set of South County East Area Study informal data requests to National Grid.
3. On April 30, 2018, National Grid responded to the first set of South County East Area Study informal data requests and requests a date to schedule a follow-up web conference.

4. On May 4, 2018, The Division informed National Grid that the Area Study review will be deferred due to the resources required for the Company's rate case.

5. On June 28, 2018, PowerServices provided a second set of South County East Area Study informal data requests to National Grid.

6. On July 18, 2018, National Grid provided responses to the second set of South County East Area Study informal data requests.

7. On July 20, 2018, National Grid hosted a meeting and web conference to review the Company's South County East Area Study with the Division and PowerServices.

8. On July 23, 2018, National Grid hosted a web conference for the Division and PowerServices to discuss NWA analysis, documentation, and status of current efforts.

9. On August 3, 2018, National Grid provided its ISR FY 2020 ISR Proposal Pre-filing Planning Information to the Division and PowerServices.

10. An August 9, 2018 meeting was held between the Division, PowerServices and the Company, to discuss the Pre-filing Planning Information and reports provided by National Grid in advance of the FY 2020 ISR Plan filing;

11. On October 4, 2018, National Grid filed its initial proposed FY 2020 Electric Infrastructure, Safety, and Reliability Plan ("Electric ISR Plan" or "ISR Plan").

12. On October 16, 2018, PowerServices participated in NWA quarterly meeting hosted by National Grid.

13. On October 22, 2018, National Grid, the Division, and PowerServices held a conference call to review the proposed FY 2020 ISR Plan.

14. On October 26, 2018, National Grid provided informal responses to discussion points from the October 22, 2018 meeting.

15. On November 1, 2018, PowerServices provided the First Set of Data Requests to the Company.

16. Between November 16, 2018 and November 30, 2018, National Grid provided responses to the First Set of Data Requests on a rolling basis.

17. On December 5, 2018, PowerServices provided the Second Set of Data Requests to the Company.

18. On December 7, 2018, the Division and PowerServices provided the Company with proposed budget adjustments in preparation for an upcoming conference call.

19. On December 12, 2018, National Grid, the Division and PowerServices held a conference call to review proposed adjustments to the FY 2020 ISR Plan. Detailed discussions addressed areas which included distribution meters under the customer requirements

spending category, URD cable replacement, Asset Replacement, I&M budget and repair cycle, Damage/Failure non-discretionary work, the Westerly Flood Project, and a newly proposed Storm Hardening project planned for Anthony Road.

20. On December 14, 2018, National Grid, the Division and PowerServices held a conference call to continue discussions on proposed areas of adjustment. PowerServices proposed initial adjustments to several components of the FY 2020 ISR Plan. The Company provided additional detailed information regarding its distribution meter replacement strategy and proposed supplemental adjustments.

21. Between December 14, 2018 and December 19, 2018, National Grid provided responses to the Second Set of Data Requests in addition to data and information as a follow up to the December 14, 2018 conference call.

22. On December 19, 2018, PowerServices provided the Third Set of Data Requests to the Company.

23. On December 21, 2018, National Grid, the Division and PowerServices held a conference call to finalize adjustments. Consensus was reached and the Company filed its Electric Infrastructure, Safety, and Reliability Plan FY 2020 Proposal, which included budget adjustments resulting from discussions with PowerServices and the Division.

24. On January 9, 2019, National Grid provided responses to the Third Set of Data Requests.

25. On February 6, 2019, PowerServices provided the Fourth Set of Data Requests to the Company.

26. On February 11, 2019, PowerServices provided the Fifth Set of Data Requests to the Company.

The overall analysis was an iterative process, which included detailed discussions of each ISR Plan spending rationale category, including Capital Expenditures, the Vegetation Management (“VM”) Plan and the Inspection and Maintenance ("I&M") Plan. The Company included each of its area experts in the discussions as we worked toward preliminary adjustments in the proposed FY 2020 Plan. This series of meetings, telephone conferences and data requests were utilized in discussions with various individuals in the Company to provide full assessment and gain clarification in each area. The formal data requests and responses

referred to above, excluding those that are considered confidential or critical energy infrastructure information, are to be submitted to the Commission by National Grid.

The structure of the FY 2020 ISR Plan filing closely followed the FY 2019 ISR Plan to the extent that the Company has included several of its historic annual programs. The Company continued to incorporate key changes noted in the prior filings, including migration of substation flood mitigation programs to an overall substation capacity enhancement and reliability program and incorporation of an Inspection & Maintenance Program to replace the phased out Feeder Hardening Program. The FY 2020 Plan continued the trend of significant discretionary spending levels for major construction, including the commencement of Southeast substation and Aquidneck Island related projects. The FY 2020 Plan includes a blend of residual capital projects previously identified by the Company, and a series of new projects emanating from completed Area Studies. As the residual capital projects are completed, the Plan should only include those new major substation projects or large programs that have been demonstrated to be necessary in a completed and fully presented Area Study.

Through the analysis and assessment process, consensus on the rationale for adjustments and the preliminary dollar levels was reached between the Division and the Company, although the Division reserved its right for additional adjustments or conditions pending further evaluation. National Grid's proposed multi-year project list and capital spending estimates, along with quarterly reports[2], were among the items utilized by the Company, the Division, and PowerServices in reaching a consensus on the preliminary adjustments. This data was used to compare the prior fiscal year ISR Plan proposed budgets to forecasted expenditures, as reflected

[2] For this report, PowerServices referenced capital spend in National Grid's Proposed FY 2020 Electric ISR Plan Filing, Attachment 4, and FY 2019 Quarterly Update - Second Quarter Ending September 30, 2018 for FY 2019 dated November 15, 2018.

in Appendix-1, along with historical budgets by spending category. Non-discretionary programs were examined to confirm that anticipated expenses were appropriately categorized and aligned with respective budget categories. There was continued discussion concerning correlations between the Damage/Failure category and the I&M Asset Replacement program costs. Planned work under recurring discretionary programs was examined to determine if proposed increases in spending were reasonable and cost effective when compared to alternatives. Additionally, discussions addressed major System Capacity and Asset Condition projects, and correlation with completed Area Studies.

For the FY 2020 Plan, agreement was reached on adjustments resulting in a proposed capital investment budget of $101.8 million. Appendix-2 lists a Summary of the Capital Outlays by key driver category and budget classification, as originally proposed by the Company on October 4, 2018, with adjustments and the resulting final proposed budget filed by the Company on December 21, 2018. Following is a detailed discussion of the categories and preliminary adjustments included in the Company's ISR Plan filing, in addition to observations and conditions recommended by the Division.

II. CAPITAL INVESTMENT PLAN

A. Overview

I have evaluated the $101.8 million FY 2020 Capital Spending Plan proposed by the Company, along with its supporting testimony and exhibits as contained in its filing dated December 21, 2018. I first reviewed the pre-file ISR budget proposal submitted to the Division on August 3, 2018 in the amount of $105.7 million, and the initial proposed ISR Plan submitted to the Division dated October 4, 2018 in the amount of $107.8 million. Over a period of approximately eleven (11) weeks, there was an iterative process in which modifications to the Company's initial proposed Capital Spending Plan were discussed. Adjustments were accepted for each of the Spending Rationales and the five (5) major categories. The following is a comparison of the Company's initial proposal on October 4, 2018, adjustments, and the Company's proposed budget as shown in Chart 7 of the FY 2020 ISR Plan as filed on December 21, 2018 in Docket No. 4915. The $101.8 million is the level reached through the evaluation process.

Table 1: Proposed FY 2020 ISR Capital Outlays by Key Driver Category

PROPOSED BUDGET by Spending Rationale	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)	% of Total Budget
Customer Request/Public Requirements	$ 27,775,000	$ (750,000)	$ 27,025,000	27%
Damage/Failure Total	$ 13,505,000	$ -	$ 13,505,000	13%
Subtotal	***$ 41,280,000***	***$ (750,000)***	***$ 40,530,000***	***40%***
Asset Condition	$ 43,825,000	$ (4,150,000)	$ 39,675,000	39%
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System Capacity and Performance	$ 22,145,000	$ (1,100,000)	$ 21,045,000	21%
Subtotal	***$ 66,520,000***	***$ (5,250,000)***	***$ 61,270,000***	***60%***
Grand Total	**$ 107,800,000**	**$ (6,000,000)**	**$ 101,800,000**	

The Company projects the need for non-discretionary expenditures of $27.0 million in Customer Request/Public Requirements spending, and $13.5 million in Damage/Failure spending. Except for known major projects, the majority of projects in the Customer Request/Public Requirements category are not precisely defined but are based on the Company's best forecast, since specific customer requests have not been made. The Damage/Failure category covers costs to replace equipment that unexpectedly fails or becomes damaged. Historical spending levels tend to serve as the primary method to develop a budget. Additionally, economic conditions are a factor considered in adjusting historical costs. There are both upward and downward trends in new construction activity, combined with the effects of inflation on the cost of raw materials, transportation, and labor. The Company is also experiencing increasing distributed generation ("DG") interconnection requests, which are unpredictable and with varying cost requirements. It is customary for costs to be reimbursed by generator owners, which may not occur in the same fiscal year of construction spend. For these reasons, it is reasonable that the overall Customer Request/Public Requirements will trend upward over time, but with some volatility due to economic cycles and DG reimbursements.

It is anticipated that the Damage/Failure category will be similarly influenced by inflation costs, but that total spend would eventually taper once the system is fully inspected and major system projects and asset replacements under the I&M program are completed. This expectation has not fully materialized. In fact, spending in the Damage/Failure category, excluding major storms, has achieved a steep incline, rising from $7.8 million in FY 2013 to a forecasted spending level of $12.4 million in FY 2019. The upward trend in costs is

influencing the overall non-discretionary category, which has historically exceeded annual targets. PowerServices continues to closely evaluate this trend, and individual projects, to ensure that the Company is not incorporating work in the Damage/Failure category that is normally captured under I&M expenses. For the FY 2020 ISR Plan proposal, the Company is proposing to spend a total of $40.5 million for all non-discretionary projects, or forty percent (40%) of the proposed capital budget. I will discuss the Damage/Failure category, non-discretionary cost trends, and correlation with discretionary spend in more detail in Sections C and D.

The remaining three (3) major categories of spending rationale for the FY 2020 budget are Asset Condition, Non-Infrastructure, and System Capacity and Performance. These categories, which are discretionary in the sense they are based on engineering, safety, reliability and economic analyses, are budgeted at $61.3 million for the remaining sixty percent (60%) of the proposed capital budget. One major project, the South Street rebuild, will be completed in FY 2020 which brings to conclusion this approximately $50 million investment that the Company has made over the past five years. Offsetting reductions due to the completion of South Street are additions of major multi-year projects in the Aquidneck Island/Newport Area and the new Southeast Substation, budgeted at $14 million and $6 million, respectively. The Company is managing major capital projects separately from other discretionary projects in accordance with recommendations in the FY 2017 ISR proceeding. The Company is also continuing to perform individual Area Studies as part of a Long Range Plan, which was first recommended in the FY 2015 proceeding. The studies produce recommended projects through FY 2030 which are ultimately phased into the ISR Plan. Two projects from the East Bay Area Study are included in the FY 2020 ISR Plan, along with the

first significant portfolio of projects from the Providence Area Study. The Area Study projects are in various stages of early engineering, permitting and procurement, and have not reached project grade cost estimates (+/- 10%). Delivery of the studies continues to fall short of the Division's expected schedule. There is no change in the status of completed studies over the past year, with only three of ten Area Studies (East Bay, Providence, and Central Rhode Island East) being completed. These three study areas represent thirty-seven (37%) of the system load. My overall evaluation considers the delays in Areas Studies and the Company's prior commitment to include in the ISR Plan only those future projects that are supported by system studies.

For the three categories (Asset Condition, Non-Infrastructure, and System Capacity and Performance), the initial proposed budget was $66.5 million, which has been adjusted down to $61.3 million in the FY 2020 ISR Plan Proposal filing based on the agreement between the Division, PowerServices, and the Company. In Sections D, E, and F, I will discuss each of these categories separately, explaining the overall reduction and budget management conditions expected of the Company. I will also compare the FY 2020 ISR proposal to historical budgets and actual expenditures to provide a trending analysis for discretionary categories.

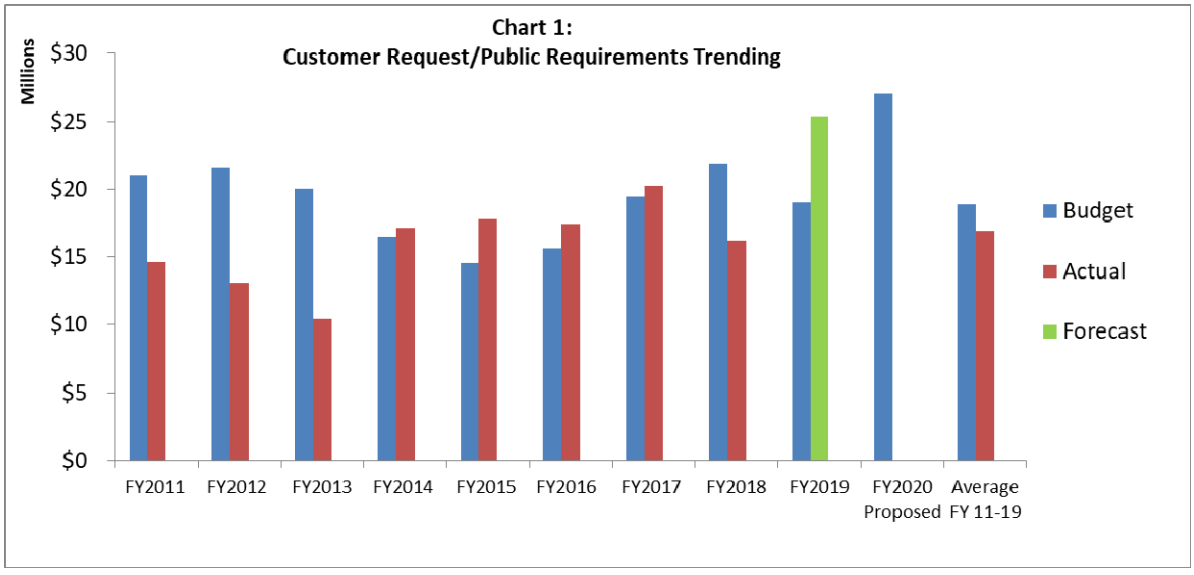
B. Customer Request/Public Requirements Category

The initial proposed FY 2020 ISR Plan included $27.8 million of Customer Request/Public Requirements cost, which the Company ultimately adjusted to $27 million. This compares to a FY 2019 ISR budget and forecast of $19.0 million and $25.4 million, respectively.

FY 2020 Proposed Budget	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)
Customer Request/Public Requirements	$ 27,775,000	$ (750,000)	$ 27,025,000

FY 2019 Budget Variance	Filed FY2019	Over/(Under) Budget	FY2019 Forecast (as of 12/21/18)
Customer Request/Public Requirements	$ 19,005,000	$ 6,379,000	$ 25,384,000

The Company expects a significant overspend in FY 2019 and increased cost projections in FY 2020, primarily due to higher DG activity. There are uncertainties in forecasting a DG budget each fiscal year, since investment depends on the number of interconnection requests, the type, and the requirements, which the Company does not control. Budget variations due to DG can be either costs incurred by the Company to manage the interconnection process and construct facilities, or credits received by the Company when the DG owner submits a Contribution in Aid of Construction ("CIAC") prior to commencement of construction. The most recent trend indicates that required DG investment is overall increasing and unpredictable, which will likely lead to further budget variations in the non-discretionary category. As shown in Chart 1 below, on average the Company has historically underspent in this category.



The forecasted FY 2019 spend and FY 2020 proposed budget are trending higher than the historical average due to DG activity. During the course of discussions, I observed that the growing number of interconnection requests and scale of DG projects are creating additional variability in the non-discretionary category. These budget variations are driven by the timing of CIAC payments relative to actual construction spend, where the DG owner submits CIAC in a fiscal year which credits the DG account, but actual construction spend by the Company occurs in the following fiscal year. The net effect is a complete offset on a project basis will not occur in the same fiscal year. There are circumstances that actual spend for DG will not be offset by CIAC, such as the cost of system improvements that benefit all customers. Due to the increasing number of DG interconnections and budget impacts, I have consulted with the Company to request that DG projects are continuously reconciled. To the extent that positive balances occur in the DG account over time, the Company should be able to provide an explanation during the annual reconciliation process.

My review of the project costs and CIAC payment for the large DG interconnection in FY 2020 indicates that the Company is not incurring expenses that are otherwise the responsibility of a third party. I also reviewed the Company's proposed $3 million for distribution meters in the Customer Request/Public Requirements category. The Company relies on this budget for meter and instrument transformer installations and replacements. The work is necessary to maintain properly functioning meters that accurately record consumption, while supporting testing requirements. The Company appears to be following a prudent strategy to replace old, damaged or obsolete meters, while ensuring that excessive investment is not incurred during evaluation of potential implementation of advanced metering infrastructure. The Division conducted a special conference on this matter with the

Company to assure that there are not wasted expenditures in view of the potential AMF system deployment currently under consideration.

Overall, recognizing the need to fund customer driven requests and DG interconnection, consensus was reached on a proposed budget of $27.0 million for Customer Requests/Public Requirements. As DG activity and resulting expenditures increase, I will continue to examine projects to ensure that those performed for customers receive the appropriate CIAC, and that the Company does not incur expenses that are otherwise the responsibility of a third party. To the extent that the Company does not reasonably incur expenses, I will recommend against recovery from ratepayers.

C. Damage Failure Category

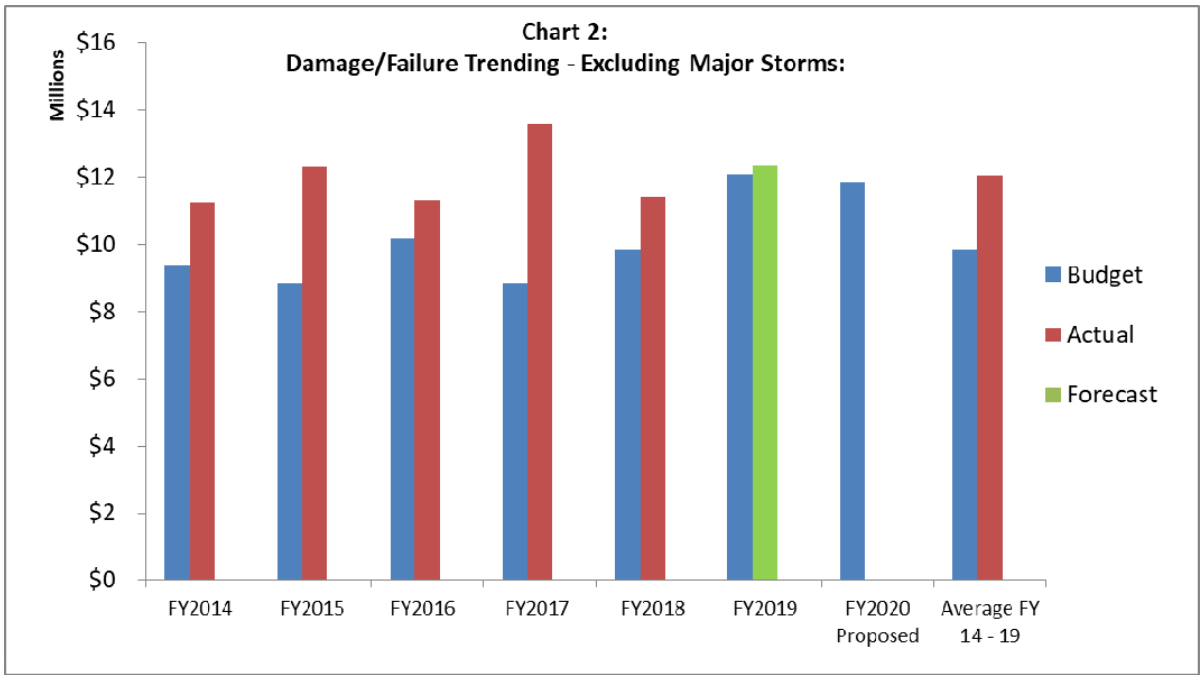
The initial proposed FY 2020 ISR Plan included $13.5 million in the Damage/Failure category for non-discretionary costs to replace equipment that unexpectedly fails or becomes damaged. This compares to a FY 2019 ISR budget and forecast of $13.7 million and $15.0 million, respectively.

FY 2020 Proposed Budget	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)
Damage/ Failure (inc. Reserves + Storms)	$ 13,505,000	$ -	$ 13,505,000

FY 2019 Budget Variance	Filed FY2019	Over/(Under) Budget	FY2019 Forecast (as of 12/21/18)
Damage/ Failure (inc. Reserves + Storms)	$ 13,674,000	$ 1,358,000	$ 15,032,000

The Company continues to incur expenses over budget in this category with an overall FY 2019 variance projected at $1.4 million, primarily due to the Storm Capital program. The Company considers work in this category unplanned by nature, and states that repairs are

rising due to "increased identification of work identified by local Operations."[3] The budget is also impacted by large, single equipment failures, such as a substation transformer. The derivation of the budget is somewhat subjective, as equipment damage is unforeseen and levels of failure are generally based on historical trends. A review of the Damage/Failure budgets versus actual spending, excluding major storms, (Chart 2) indicates that the Company is consistently overspending in this category.



This trend of overspend has been recognized for several years. I continue to have several areas of concern, including whether the Company is accurately reflecting the type and level of work performed under the I&M program, which influences the Damage/Failure expenses, and using appropriate methodologies to estimate the budget. To aid in ongoing evaluations, I recommended in my FY 2017 report, and the Company agreed, to provide quarterly reporting

[3] National Grid's Proposed FY 2020 Electric ISR; Section 2, page 20.

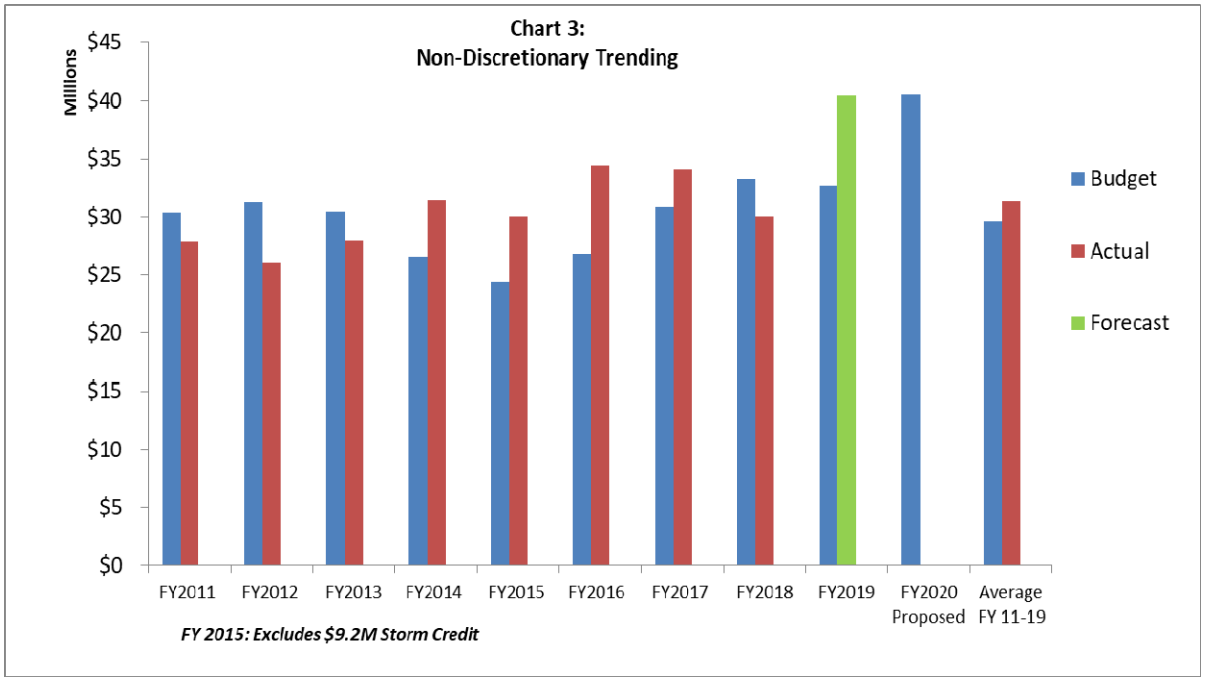
on Damage/Failure expenditures to include the details of completed projects by operating region. The Company provided additional detailed Damage/Failure work orders for projects completed in FY 2019 as part of their response to Data Request DIV 2-9. It is not clear from my examination of the Company's most recent Damage/Failure activities that projects are properly classified within this non-discretionary category.

A review of the Company's work order descriptions show that many activities were due to failed equipment but, in some instances, projects appear to involve equipment replacement where imminent failure is not evident, implying that it could have been performed under a discretionary program. There is not a clear delineation of when field equipment must be replaced due to obvious damage, as opposed to potential failure which may be condition related. In those cases where immediate action is required due to a failure or to maintain safety and reliability, non-discretionary spend is absolutely warranted. Alternately, where work performed could have been deferred without compromising safety or reliability, it aligns with discretionary spend. For these reasons, I have maintained and continue to believe that the Damage/Failure category is highly correlated with work performed under the I&M category. Examples of program intersection include pole, guy, and anchor replacements where the I&M inspection process documents the need to repair or replace specific items on a future cycle basis. Within a current fiscal year, however, the Company's field personnel may identify those very same deficiencies and determine that immediate action is warranted since they have been provided the time and resources to make such repairs. This is not a criticism of the Company's proactive approach for system maintenance, but rather acknowledgement that the Company's planners, operations personnel, and field crews drive decisions to manage smaller system repairs and improvements. In order to afford the

Company the latitude to manage this work within reasonable budgets, and reduce the need to reconcile thousands of work orders between non-discretionary and discretionary spending categories, I recommend that the Company and Division explore the option of retaining a portion of the budget in the non-discretionary category to address failed equipment, and collapsing the remaining Damage/Failure and I&M budget under the discretionary category. I discuss this recommendation in more detail in Section D.

Upon conclusion of the evaluation, no adjustments were recommended to Damage/Failure or to the Major Storms budget within this category. This resulted in a final budget of $13.5 million for Damage/Failure, including storm reserves. The Company will continue to augment quarterly reporting by including additional detail on spending within the Damage/Failure category. In addition, I recommend that the Company and Division consider a method to combine and manage a discretionary budget for repairs completed in the Damage/Failure and I&M categories separately from a budget required to replace failed equipment in the non-discretionary category.

This brings the total non-discretionary categories of Customer Request/Public Requirements and Damage/Failure to $40.5 million, which is forty percent (40%) of the total Capital Investment Budget by Key Driver Category. Chart 3 shows a comparison of historical spending versus budget.



D. Asset Condition Category

The Asset Condition category, with an initial proposed budget of $43.9 million, represents a combination of strategies and programs targeting equipment replacement to maintain reliability performance. Spending is further divided into Asset Replacement and inspection and maintenance components. The I&M Program is a result of the successful transition of previous Feeder Hardening, Feeder Health and associated Operation & Maintenance activities. The Asset Replacement program is generally a combination of major substation upgrade projects and programs designed to replace groups of equipment throughout the system. Projects and programs in the Asset Replacement category, which have become increasingly significant in scope and budget, span multiple years. This spending category, dominated in the past four years by the $50 million South Street Substation upgrade in Providence, continues to include a mix of large projects along with smaller projects executed under ongoing programs. The Company continues to track major projects separately, which

provides transparency and enables the Division to monitor budget estimates, scope, and actual construction spend from inception to completion. It also mitigates the Company's tendency to shift budgets between discretionary projects in order to meet an overall target, rather than managing independent projects based on need.

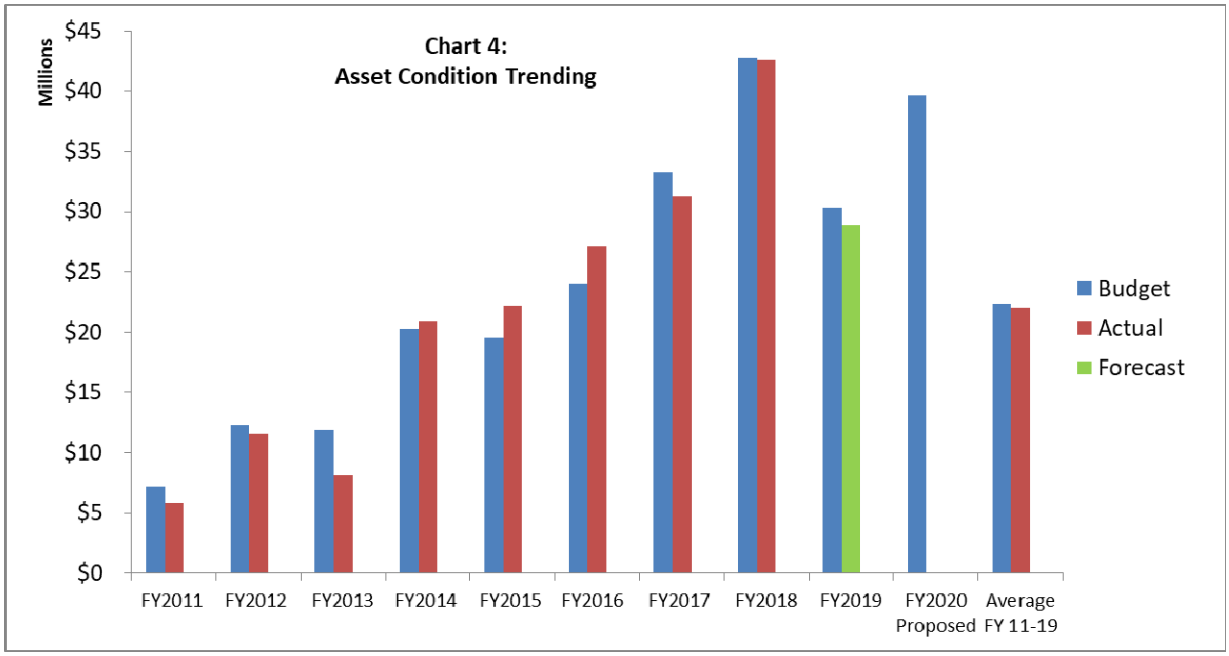
Evaluation of the Asset Condition category separately considers major projects from remaining budget areas. Within the major projects category, Southeast is the currently the most significant project. Discussions with the Company regarding Asset Replacement (major projects and recurring programs), and the I&M program resulted in adjustments of $4.2 million, and a final proposed budget of $39.7 million, which is thirty-nine percent (39%) of the overall ISR Plan budget. This compares to the FY 2019 budget and forecasted actuals of $30.4 million and $28.9 million respectively. A detailed evaluation of each category follows.

FY 2020 Proposed Budget	NG Initial Proposed Budget (8-3-18)	Net Adjustments	National Grid Proposed Budget (12-21-18)
Asset Condition - Major Projects			
South Street	$ 1,800,000		$ 1,800,000
Southeast	$ 6,250,000		$ 6,250,000
Flood - Westerly	$ 315,000	$ (225,000)	$ 90,000
Flood - Hope Substation	$ 750,000	$ -	$ 750,000
Dyer Street-Indoor Substation	$ 4,900,000	$ -	$ 4,900,000
Providence LT Study	$ 2,860,000	$ -	$ 2,860,000
Major Projects Total	**$ 16,875,000**	**$ (225,000)**	**$ 16,650,000**
Asset Replacement - Recurring Programs	$ 22,825,000	$ (1,500,000)	$ 21,325,000
Asset Replacement - I&M (NE)	$ 4,125,000	$ (2,425,000)	$ 1,700,000
Asset Replacement/I&M Total	**$ 26,950,000**	**$ (3,925,000)**	**$ 23,025,000**
Total Asset Condition	**$ 43,825,000**	**$ (4,150,000)**	**$ 39,675,000**

FY 2019 Budget Variance	Filed FY 2019	Over/Under Budget	FY 2019 Forecast
South Street	$ 3,720,000	$ 352,000	$ 4,072,000
Remaining Major Projects	$ 6,055,000	$ (1,766,000)	$ 4,289,000
Asset Replacement - Recurring Programs	$ 18,893,000	$ (70,000)	$ 18,823,000
Asset Replacement - I&M (NE)	$ 1,700,000	$ 14,000	$ 1,714,000
Total Asset Condition	$ 30,368,000	$ (1,470,000)	$ 28,898,000

Asset Condition spend has steadily increased due to aging equipment throughout the service territory and the need for significant upgrades in highly loaded corridors. The South Street substation rebuild will be completed in FY 2020, with a projected spend of $1.8 million in its final year. Major multi-year investments, including Southeast substation and projects emanating from both the East Bay Area Study and Providence Area Study, are now included in the ISR Plan. A review of major projects along with asset replacement activities and I&M work (Chart 4) shows increased costs between FY 2016 and FY 2018, driven by South Street, reductions in FY 2019 as South Street spend tapered, and higher projections in FY 2020 as new long term planned projects move into engineering and construction phases.

These budget variations are consistent with my expectation that the Company's condition-related projects would be guided by a disciplined long-term plan. As legacy projects are completed, new projects such as East Bay and Providence Area are naturally phased in alignment with previously performed Area Studies. Budget needs are now strategically supported with improved forecasts of regional project needs, as opposed to previous years where discretionary investments were made in reaction to isolated system conditions. It should be emphasized that portfolios of projects associated with Area Studies will be categorized in either the Asset Replacement budget category or System Capacity budget category, and both are projected to drive future discretionary spend.



1. Asset Replacement - Major Projects

As South Street comes to completion, the Company is proposing additional major projects driven by asset condition. The majority are legacy projects that were previously considered for inclusion in the ISR (Southeast, flood related projects, and Dyer Street). Of these, Southeast substation is the most significant project, with an estimated total cost of nearly $20 million and a final proposed FY 2020 budget of $6.3 million. The new station is planned to solve condition, safety and reliability issues with the Pawtucket No. 1 station constructed in 1907. This project is prioritized due to the age and condition of existing equipment, and continues to be supported in the ISR Plan. The Company is forecasting actual FY 2019 spend on this project to be very close to budget, which is a positive trend. I expect that the Company will continue to track the Southeast project separately from other projects and provide quarterly updates on budget variances and project progress, similar to reporting provided for South Street.

The Company also proposed work at two substations as part of their flood hardening strategy, including a small project to raise equipment at Hope Substation and a multi-year $8 million proposal for Westerly Substation. The initial proposed spend for Westerly included $315,000 in FY 2020, building upon the FY 2019 budget of $536,000. Upon request to provide a detailed scope and cost, the Company replied that, as a result of changing climate resiliency concepts, it had decided to cease the long-term flood mitigation project and implement a short term solution. The Company further stated that it would reassess the need to rebuild Westerly station at a higher elevation, taking into account area long-term growth, in its pending South County West Area Study (National Grid Response to Data Request DIV 2-10). I emphasize this point to reinforce my recommendation that the Company not pursue significant projects unless compelled by an Area Study. In this case, the Company appropriately deferred the Westerly project with the understanding that the optimal solution to flood mitigation is influenced by the broader area needs. The Company also made additional efforts to re-evaluate their current flood mitigation strategy, seeking cost effective methods to develop immediate flood hardening response action as opposed to extremely expensive construction options. Upon conclusion of discussions, the Company clarified that the total Westerly capital budget was estimated at $1.5 million to implement a short term flood hardening solution with a projected spend of $90,000 in FY 2020.

The Asset Replacement category of the ISR Plan also includes condition-based projects identified in the Providence Area Study, which was completed in 2017. The study considered the Providence urban area consisting of older, underground distribution facilities and indoor substations dating back to when the system was originally installed

in the 1920's. The FY 2020 proposed budget of $2.9 million is designated for engineering costs as the Company moves through its sanctioning process and prepares to launch a series of multi-year projects. Applying the Area Study as a forecasting metric indicates that the Company will spend over $120 million over twelve years for planned Providence Area projects. The Area Study estimates are considered Investment grade, or +200/-50%. The Company incurs preliminary expenditures for engineering as the project moves through its internal sanctioning process and reaches Project grade, or +/- 10%, which is expected before construction commencement. I have previously evaluated the Providence Area study and have concurred with the resulting solutions that will ultimately be completed as part of the ISR Plan. However, I continue to have concerns that initial estimates could rise by as much as 200%. The Company has previously committed to improving their estimating process and it is my expectation that it has enhanced both budgeting and project management such that projects are performed on target and never reach 200% above initial cost estimates. I will monitor sanctioned projects emanating from Area Studies to ensure that scopes and costs are reasonable, and aligned with the outcome of the study. As the projects advance through construction, I will also examine actual expenditures against budgeted amounts to determine the Company's success managing multi-year projects to budgets.

In summary, the major projects within the Asset Replacement category are a combination of legacy and Area Study projects. Southeast substation is the predominant project in the near term, with Providence Area projects expected to drive significant capital needs going forward. As the Providence Area projects are sanctioned, detailed reviews will be performed to confirm that scope and cost estimates align with solutions identified in the

Company's previously performed Area Studies. Additionally, cost estimates will be monitored to determine if the Company has improved its internal processes to mitigate huge variances between initially budgeted amounts and actual expenditures. Over the course of this ISR review, the Company's initial proposal of $16.9 million was minimally adjusted, and a proposed budget of $16.7 million was accepted.

2. Asset Replacement – Recurring Programs

The Asset Replacement category contains recurring programs that have been included and reviewed in prior ISR Plan filings. Proposed budgets in this discretionary category are generally based on equipment age, condition, criticality rankings, and the Company's planned level of work. For FY 2020, the Company proposed a $22.87 million budget for customarily recurring programs to replace infrastructure such as substation batteries, metalclad switchgear, substation breakers and reclosers, URD cable, underground cable, line reclosers, and miscellaneous blanket projects.

To evaluate the need and support for projects within this category, the Company was requested to provide studies, condition assessments, criticality rankings, or other planning documents containing updated information. While the Company has provided much of this information in the past, it has become apparent that many legacy programs previously supported have not advanced. The pace of completion has been controlled by the Company's decision to regulate discretionary spending, and projects are often deferred to accommodate more emergent work while meeting an overall budget target. This creates a lag time in project completion, but is a prudent strategy when more critical projects within the ISR Plan require capital investment.

Concurrent with project lag time, specifically over the past four years, the Company has also been performing several system Area Studies. The outcome of Area Studies tends to impact major projects in the Asset Replacement category more so than recurring programs, but the study status must be considered when evaluating condition based programs. My evaluation of the proposed spend for various programs, such as metalclad switchgear or transformer replacement, first determines if work is aligned with an Area Study. This ensures that equipment replacement considers broader area needs, is sufficiently sized for load growth, and includes compatible technology for future grid modernization. Detailed discussions with the Company confirmed that proposed projects did not conflict with Area Studies.

Next, I evaluated projects in terms of level of spend and criticality. Unless there is an emerging need, the Company relies on historical work completed and associated spend as a metric for current budgets. As each year progresses, the Company methodically replaces the most critical assets, which is practical given that system reliability has not been sacrificed under this strategy. My review of the FY 2020 ISR Plan found that the Company's proposed infrastructure replacements and associated budgets were reasonable, with the exception of one category that did not present critical needs for investment above historical spending levels. Analysis of the individual programs resulted in a downward adjustment of $1.5 million for a proposed budget of $21.3 million for recurring programs.

3. Inspection & Maintenance Program

The I&M Program addresses deteriorated assets to ensure that the distribution and sub-transmission system is safe, reliable and environmentally sound. Inspections[4] are performed on a five-year cycle, and the proposed plan is designed to fund repair work necessary to reach a ten-year repair cycle. The program has both capital and O&M components. The Company completed the final year of the five-year inspection cycle in FY 2016, and will be in the second five-year inspection cycle in FY 2020. The Company has completed repair work on 114 of the 375 total feeders[5] in the overall electric system in Rhode Island, or thirty (30%) of feeders. In addition, the Company anticipates O&M expenses for the Volt-VAR Optimization and Conservation Voltage Reduction ("VVO/CVR") expansion program, continuation of mobile elevated voltage testing, and long range planning study costs. The initial proposed FY 2020 ISR Plan included $4.1 million for I&M capital costs and $1.2 million for all O&M expenses, for a total program budget of nearly $5.4 million. This compares to a FY 2018 ISR budget of $1.7 million for I&M capital and $1.3 million for O&M expenses, with forecasted actual spend showing minimal variance to budget. Discussions with the Company resulted in significant reductions to the FY 2020 capital component and a moderate refinement to the O&M category, totaling $2.4 million, for a final proposed program budget of $3 million.

[4] National Grid's Proposed FY 2020 Electric ISR; The Company categorizes deficiencies found during inspections as Level I, II and III. Costs for Level I repairs, requiring immediate attention, are captured under the Damage/Failure category.

[5] National Grid's Inspection & Maintenance Program Cost/Benefit Study – Working Document for August 9, 2018 meeting (dated August 3, 2018), page 1.

FY 2020 Proposed Budget I&M Capital and O&M	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)
Capital Costs (included in capital budget)	$ 4,125,000	$ (2,425,000)	$ 1,700,000
Opex Related to Capex	$ 256,000	$ -	$ 256,000
Inspections and Repair Related Costs	$ 515,000		$ 515,000
Removal Costs	$ 136,000	$ -	$ 136,000
Long Range Plan Study	$ 25,000		$ 25,000
VVO/CVR Program O&M	$ 311,000		$ 311,000
Total Operation and Maintenance Expenses	**$ 1,243,000**	**$ -**	**$ 1,243,000**
Total Program Costs	**$ 5,368,000**	**$ (2,425,000)**	**$ 2,943,000**

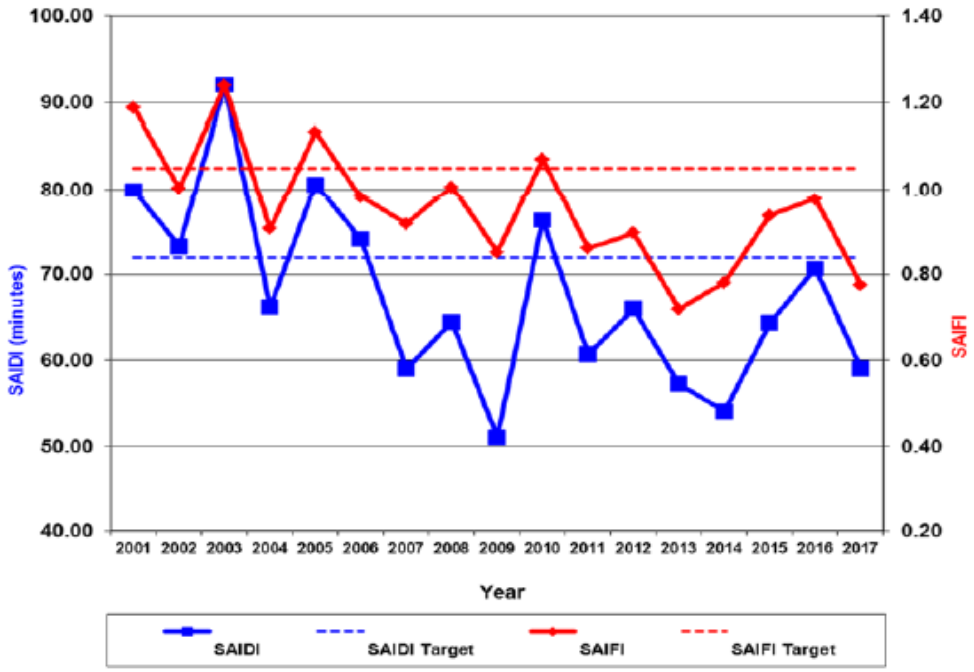
FY 2019 Budget Variance I&M Capital and O&M	Filed FY2019	Over/(Under) Budget	FY2019 Forecast (as of 12/21/18)
Capital Costs (included in capital budget)	$ 1,700,000	$ 14,000	$ 1,714,000
Opex Related to Capex	$ 255,000	-	$ 255,000
Inspections and Repair Related Costs	$ 612,000	$ -	$ 612,000
Removal Costs	$ 153,000	$ -	$ 153,000
Long Range Plan Study	$ 25,000	$ -	$ 25,000
VVO/CVR Program	$ 244,000	$ -	$ 244,000
Total Operation and Maintenance Expenses	$ 1,289,000	$ -	$ 1,289,000
Total Program Costs	**$ 2,989,000**	**$ 14,000**	**$ 3,003,000**

For the FY 2020 I&M capital budget, the Company requested $4.1 million, which is nearly $2.5 million above the FY 2019 forecasted spending level. Funding for the I&M program was originally intended to achieve a 5-year cycle for both inspections and repairs. The Company has been able to adhere to a 5-year inspection cycle, but the repair cycle has lagged. This is primarily due to budget reductions in previous years that were suggested by the Division, and implemented by the Company, in order to meet overall discretionary spending needs driven by major projects. In an effort to accelerate repairs, the Company has initiated a streamlined method that focuses on highest priority issues, such as Level 9 urgent issues, potted porcelain cutouts, and certain guying issues. With the streamlined approach, the Company calculates that an 11-year repair cycle can be achieved with a program cost of $4.1 million. At a funding level of $1.7 million, the

Company estimates a repair cycle at over twenty-five (25) years (National Grid Response to Data Request DIV 2-8).

I have reviewed and commented on the I&M program in detail in past ISR Plan proceedings and continue to maintain that the program is mature, and successful implementation has produced excellent reliability results. The Company continues to meet or exceed annual service reliability targets since 2010. (Chart 5).[6]

CHART 5: RI Reliability Performance Regulatory Criteria
(Excluding Major Event Days)



The question remains as to whether the I&M program benefits warrant an increase in this discretionary spend category. Each year the Company tracks and prepares an annual

[6] National Grid's Proposed FY 2020 Electric ISR; Section 2, page 3.

report on the costs and benefits for its I&M Program. The most recent report[7] contains reliability statistics for 114 feeders that had work completed since 2013. To calculate the reliability benefits for the I&M Program, the Company uses the average number of events and customer interruptions (CI) due to deteriorated equipment, animals, and lightning over a three year period prior to the repair work year as a baseline. Extensive data is presented and analyzed with a general conclusion of mixed results. Some feeders experience improvements in the immediate years following repairs, while others have higher numbers of customer interruptions from varying causes. The Company advises, and I agree, that the data is a small sample size, and more time and feeder repairs are needed to reach definitive conclusions.

Given the mixed results of the cost/benefit analysis, I continue to support a moderate annual spending level for the I&M Program. Allocating less spend to I&M releases capital for the Company's strategic investments in Area Study projects that will continue to place upward pressure on the discretionary budget. There is no indication that system conditions have suffered from an extended I&M repair cycle. Additionally, as I noted earlier in this report, there are likely many I&M related repairs that are being performed under the Damage/Failure category. These categories are highly correlated in that they identify and repair damaged or deteriorated equipment. For instance, the Company's report of outstanding I&M Level II and Level III repairs indicates that there are over 29,000 poles that are damaged, leaning, or that have visual decay. Similarly, there are over 650 instances of broken guy wires. (National Grid Response to Data Request DIV 3-

[7] National Grid's Inspection & Maintenance Program Cost/Benefit Study – Working Document for August 9, 2018 meeting (dated August 3, 2018).

4). Review of the Company's FY 2019 Damage/Failure completed work orders for the six months from April through September reveal that there were 286 repairs or replacements related to Poles/Guys/Anchors (National Grid Response to Data Request DIV 2-9). The work order descriptions are not standardized, but many entries relate to damaged, leaning or rotted poles. It is very likely that work performed under Damage/Failure addressed the same deficiencies in the I&M category. I am not suggesting the Company constantly cross-reference work orders to outstanding I&M deficiencies, but rather that it collapse the budget for these categories and manage field efforts under one discretionary category. The objectives are clearly the same for these categories, which is small scale, proactive infrastructure replacement to maintain safety and reliability. A portion of the Damage/Failure budget may continue to reside in the non-discretionary category for costs of Level I I&M repairs, or to replace equipment that either unexpectedly fails or is damaged to the point where immediate failure is certain. Otherwise, the repair should be performed under the discretionary I&M category. I recommend that the Company consider this proposal for the FY 2021 ISR Plan.

Overall, my review continues to support controlled spending and the Company's streamlined approach for the I&M Program. Through discussions with the Company, reductions totaling $2.5 million were applied which resulted in a final proposed capital budget of $1.7 million. The budgets for the associated Opex, Inspection and Repair costs, and Removal Costs were proposed at reasonable levels, and no adjustments were applied. I encourage the Company to continue monitoring results of the I&M cost/benefit analysis as additional data becomes available, and expect that the Company will raise concerns with program results and propose adjustments when warranted. Concurrently, I

recommend that the Company consider a method to combine and manage a discretionary budget for repairs completed in the Damage/Failure and I&M categories separately from a budget required to replace failed equipment in the non-discretionary category. This approach creates a clear delineation in spending rationale, offers complete transparency of costs due to failed equipment, provides Company personnel the latitude to manage smaller system repairs under a single budget, and removes the need to reconcile thousands of work orders between discretionary and non-discretionary categories.

The remaining O&M components of the ISR Plan relate to the mobile elevated voltage testing program, system planning study costs, and VVO/CVR expansion. There were no budget adjustments to these categories. I will address elevated voltage testing in this section and VVO/CVR in the System Capacity section.

The Company's mobile elevated testing program, which emanates from the Rhode Island Contact Voltage statute § 39-2-25(b)(6), will be in year four of the second five-year inspection cycle in FY 2019. Initially, the Company's vendor conducted surveying, testing, and required repairs on 100% of designated areas. The program has now transitioned to a survey and testing schedule based on the statutory minimum of 20% of designated areas. The Company has also completed the sale of streetlights to the City of Providence and the Town of Westerly. Although asset ownership has changed, the Company, by statute, remains responsible for surveying and testing for elevated voltage within the municipal rights-of-ways. Consistent with my prior recommendation, the Company has implemented a solution to meet statutory requirements through agreements with these municipalities whereby the Company continues testing and the municipality is

responsible for remediation work. Alternately, Pawtucket, Newport and Westerly have not purchased their streetlights, therefore, the Company does not have firm agreements with these municipalities regarding repair work associated with mobile testing[8]. I expect that prior to the Company's scheduled testing in these regions, the Company will confirm the status of the streetlight purchase and have necessary agreements in place to address repairs.

I also observe that the time commitment to perform the work is reduced from two weeks to three days each year, and results in lower O&M costs. The testing cost in FY 2018 was $80,000 for 20% of the system, as compared to $222,000 for 100% of the system in FY 2017. I anticipate that FY 2019 costs will follow this trend. The Company has appropriately budgeted $80,000 for its Contact Voltage Program Spend in FY 2020. I recommend, however, that the Company initiate negotiations with its vendor as allowed for in the current contract in order to achieve more favorable rates in FY 2020 and future years. Based on my review, I confirm that the Company's approach to the Contact Voltage Program is acceptable and appropriately balances statutory obligations with safety requirements.

In summary, concurrence was reached on net budget reductions of $2.5 million for the total I&M program, resulting in a FY 2020 proposed capital budget of $1.7 million and $1.2 million for O&M. This brings the total FY 2020 ISR proposed capital budget for Asset Condition to $39.7 million, comprised of $16.7 million for major projects, $21.3 million for recurring projects, and $1.7 million for the I&M program.

[8] RIPUC Docket 4237, National Grid 2018 Contact Voltage Annual Report Compliance Filing.

E. Non-Infrastructure Category

This category is for telecommunications and other capital expenditures needed for operation, which are neither related to condition nor system capacity. I consider this $550,000 of capital expenditures prudent and necessary, while consistent with prior costs.

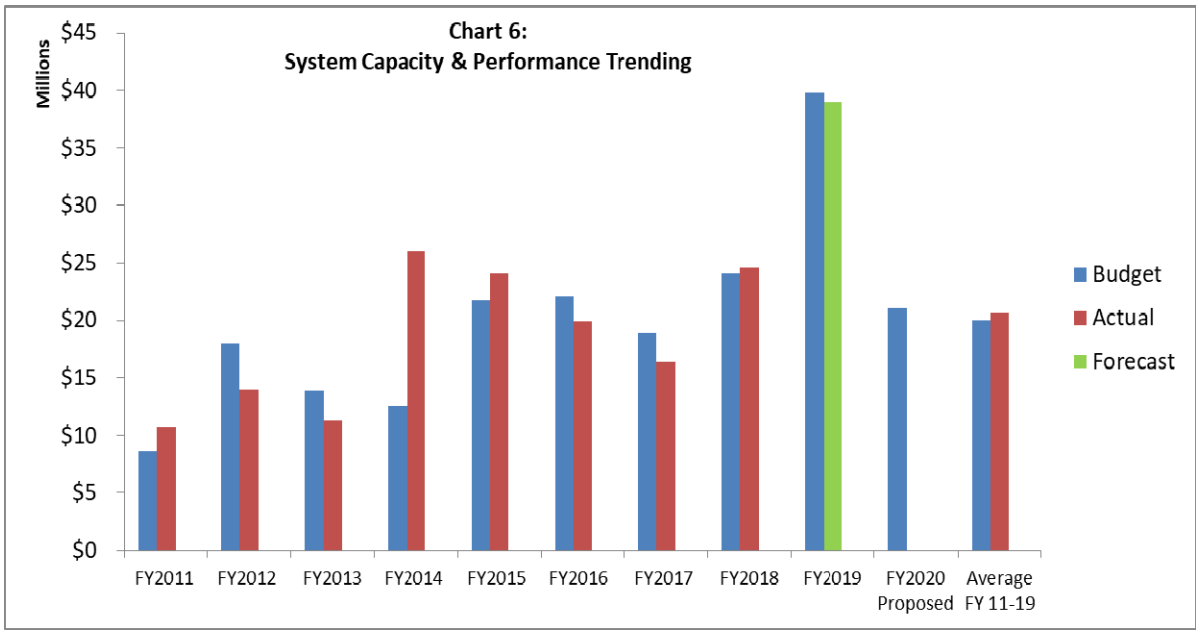
F. System Capacity and Performance Category

The System Capacity and Performance category is comprised of both Load Relief and Reliability Projects. A significant portion of this discretionary budget is dedicated to substation capacity expansion projects. The Company initially proposed to expend $22.2 million in FY 2020 which is almost half of the FY 2019 projection, and is closer to historical spending levels. Additional adjustments were applied during the course of my evaluation, discussed below, which decreased the final proposed budget to $21.1 million, or twenty-one percent (21%) of the total FY 2020 ISR Plan budget.

FY 2020 Proposed Budget	NG Initial Proposed Budget (8-3-18)	Net Adjustments	National Grid Proposed Budget (12-21-18)
Load Relief Major Projects			
Aquidneck Island (Newport projects)	$ 4,755,000	$ -	$ 4,755,000
Aquidneck Island (Jepson projects)	$ 9,300,000	$ -	$ 9,300,000
New London Ave Substation #150	$ 150,000	$ -	$ 150,000
Warren Substation	$ 600,000	$ -	$ 600,000
East Providence Substation	$ 1,280,000	$ -	$ 1,280,000
Major Projects Total	**$ 16,085,000**	**$ -**	**$ 16,085,000**
Reliability Total	**$ 6,060,000**	**$ (1,100,000)**	**$ 4,960,000**
Total System Capacity & Performance	**$ 22,145,000**	**$ (1,100,000)**	**$ 21,045,000**

FY 2019 Budget Variance	Filed FY 2019	Over/Under Budget	FY 2019 Forecast
Aquidneck Island (Newport projects)	$ 12,250,000	$ (1,599,000)	$ 10,651,000
Aquidneck Island (Jepson projects)	$ 9,284,000	$ (214,000)	$ 9,070,000
Remaining Major Projects	$ 12,454,000	$ 1,839,000	$ 14,293,000
Major Projects Total	**$ 33,988,000**	**$ 26,000**	**$ 34,014,000**
Reliability -Total	**$ 5,176,000**	**$ (152,000)**	**$ 5,024,000**
Total System Capacity & Performance	**$ 39,164,000**	**$ (126,000)**	**$ 39,038,000**

The Company is managing the FY 2019 forecast close to budget by balancing projects solely within this category, rather than measuring performance against other significant projects. In the past, the Company tended to adjust projects in the System Capacity and Performance category in order to compensate for over-spend in the Asset Condition category, specifically for major projects that exceeded budget, such as South Street. Consistent with my previous recommendation in the FY 2017 proceeding, major projects in the System Capacity and Performance are now managed separately to encourage the Company to focus on transparency and accountability for projects within this specific category. Review of prior actual expenses as compared to budget (Chart 6) shows that the Company, on average, is trending very close to budget, as opposed to previous years that incurred significant over-spend. The chart also shows dramatically increasing costs in FY 2019, which are driven by major projects in the Aquidneck Island/Newport area.



The Load Relief category is a mixture of legacy projects, or those projects that have been independently studied and historically considered for inclusion in the ISR, in addition to two projects associated with the East Bay Area Study. The FY 2020 Plan continues to be transitional, since it includes a blend of residual capital projects previously identified by the Company and a series of new projects emanating from completed Area Studies. To illustrate the sequencing between legacy and Area Study projects, a comparison of FY 2019 and FY 2020 major system capacity projects is provided in Table 2. Most legacy projects, with the exception of Aquidneck Island, are expected to be complete in FY 2020 while the East Bay Area projects are commencing.

Table 2: Comparison of FY 2018 and FY 2019 System Capacity Projects

System Capacity and Performance Load Relief Major Projects		FY 2019		FY 2020
Legacy Project or Area Study	**Project**	Budget	Forecast	Budget
Legacy Project	**Aquidneck Island (includes former Jepson & Newport projects)**	$ 21,534,000	$ 19,721,000	$ 14,055,000
Legacy Project	**Chase Hill (Hopkinton) & Related**	$ 3,900,000	$ 3,826,000	$ -
Legacy Project	**New London Ave Substation #150**	$ 6,416,000	$ 8,343,000	$ 150,000
Legacy Project	**Quonset Sub**	$ 1,288,000	$ 1,207,000	$ -
East Bay Area Study	**Warren Substation**	$ 450,000	$ 440,000	$ 1,280,000
East Bay Area Study	**East Providence**	$ 400,000	$ 477,000	$ 600,000
Load Relief Major Projects Total		**$ 33,988,000**	**$ 34,014,000**	**$ 16,085,000**

Aquidneck Island projects (formerly Jepson and Newport projects), or the most significant Load Relief projects, are budgeted at $14 million in FY 2020 and estimated to

reach $56 million in total. The portfolio of related projects, particularly Jepson Substation, is driven by the outcome of an area reliability study which identified potential problems in meeting area load requirements under contingency conditions, or the loss of critical components. The Company assessed solutions and selected the most economical long term solution to solve the reliability issues.

I performed an extensive review of the proposed transmission upgrade and work related to Jepson substation under RIPUC Docket 4614, including assessment of both traditional and non-wires alternatives. My review resulted in concurrence that these legacy projects present the most cost effective solutions to contingency issues. Non-wires alternatives do not provide a viable option due to the magnitude and duration of load loss, coupled with the age and condition of equipment. I also agree with the related work at Newport and all associated substation retirements. There is one remaining legacy project previously approved for inclusion in the Plan, New London Ave. Substation, with a budget of $150,000. This results in a total proposed budget of $14.2 million for all legacy load relief projects.

The FY 2020 ISR Plan load relief category now includes two projects supported by the East Bay Area Study, which is the first regional planning study to be completed by the Company. These projects consist of East Providence and Warren Substations, which are aligned with the recommended solutions identified in the study that I previously evaluated. The Area Study projects a six-year timeline for both projects at an Investment grade cost estimate level (+200/-50%) of $13.4 million for East Providence and $7.2 million for Warren. The ISR Plan now indicates Engineering grade cost estimates

(+50%/-25%) of $16 million and $8.7 million, respectively, for these projects. Similar to major projects in the Asset Condition category, I have concerns that cost estimates can increase by 200% as projects move from Area Studies to Project level within the ISR Plan. Although the current East Bay projects did not achieve the top threshold, I will continue to monitor future project estimates as preliminary engineering is complete, and evaluate sanctioning papers to ensure that scopes and costs are reasonable and aligned with the outcome of Area Studies prior to the Company expending major capital. As the projects advance through construction, I will also examine actual expenditures against budgeted amounts to determine the Company's success in managing multi-year projects to budgets.

My analysis and discussions of Area Study related projects in the Load Relief category resulted in no adjustments, and concurrence was reached on a final proposed FY 2020 ISR Plan budget of $1.9 million. Combined with the $14.2 million for legacy projects, the overall Load Relief category reached a final proposed budget of $16.1 million.

In the Reliability category, the Company proposed a $6.1 million budget for several recurring projects, the majority of which were included in the FY 2019 ISR Plan. The most significant addition was a Storm Hardening project proposed at $1.1 million. Overall, the Company is tracking close to its total FY 2019 budget, with individual projects experiencing both over and under-spend. I evaluated each project in the FY 2020 ISR Plan and, based on additional information provided by the Company, adjustments of $1.1 million were applied, bringing the final proposed total down to $5 million. I address the programs in more detail below.

FY 2020 Proposed Budget	NG Initial Proposed Budget (8-3-18)	Net Adjustments	National Grid Proposed Budget (12-21-18)
Volt/Var	$ 1,850,000	$ -	$ 1,850,000
Storm Hardening	$ 1,100,000	$ (1,100,000)	$ -
EMS/RTU	$ 310,000	$ -	$ 310,000
OH Line Transformer Replacement	$ 600,000	$ -	$ 600,000
Other Load Relief & Reliability	$ 665,000	$ -	$ 665,000
3VO	$ 210,000	$ -	$ 210,000
Blanket Projects - SCP	$ 1,325,000	$ -	$ 1,325,000
Reliability Total	**$ 6,060,000**	**$ (1,100,000)**	**$ 4,960,000**

FY 2019 Budget Variance	Filed FY2019	Over/(Under) Budget	FY2019 Forecast (as of 12/21/18)
Volt/Var	$ 1,900,000	$ 232,000	$ 2,132,000
Storm Hardening	$ -	$ 19,000	$ 19,000
Other Flood Projects	$ 1,020,000	$ (835,000)	$ 185,000
EMS/RTU	$ 551,000	$ (322,000)	$ 229,000
OH Line Transformer Replacement	$ 550,000	$ (229,000)	$ 321,000
Other Load Relief & Reliability	$ (777,000)	$ 1,378,000	$ 601,000
3VO	$ 200,000	$ -	$ 200,000
Blanket Projects - SCP	$ 1,732,000	$ (395,000)	$ 1,337,000
Total Reliability	$ 5,176,000	$ (152,000)	$ 5,024,000

For the FY 2020 ISR Plan, the Company proposes funding additional VVO/CVR projects. In my FY 2018 ISR Plan report, I expressed that this initiative was an example of technology deployment that brings necessary grid enhancements, but it must be well-vetted to ensure that the Company is deploying optimal technology that is compatible with current operations as well as long term strategies. For the VVO/CVR project, the Company satisfied this requirement by performing a pilot which documented a favorable cost/benefit ratio. I continue to concur with the Company's request for capital investment in this area, but note that project implementation at current sites may not meet the expected completion date in March 2019. The Company states that delays have been caused by more extensive design work than anticipated, along with the need to manage

around customer driven DG projects (National Grid Response to Data Request DIV 1-4). Since the Company forecasts investing approximately $2 million each year for future projects, I expect that design and scheduling will improve based on the lessons learned from these early installations, but if cost overruns and delays continue to occur, the anticipated net benefits will likely be diminished. In order to ensure that VVO/CVR expansion projects are cost effective, I recommend that the Company analyze the cost/benefit ratio for each circuit using actual construction costs.

The Company also proposed a Minor Storm Hardening project consisting of re-conductoring approximately 4.82 miles of overhead primary at a cost of $1.1 million. The targeted area, Anthony Road, has been experiencing outages during Minor Storms, which the Company defines as "occurring on days when the network experiences an exponentially greater number (between 1.5 and 2.5 Beta plus three times the average number of events) of SAIDI minutes due to a weather event." (National Grid Response to Data Request DIV 1-6). Analysis of outage data indicates that over fifty percent (50%) of outage minutes were tree related. The Company solution is to remove existing conductor and re-install either covered conductor ("tree wire"), or cables bundled with spacers, under the premise that tree and limb contact are less likely to cause faults that lead to outages. Discussions with the Company confirmed that the feeder was located in a heavily wooded portion of the service territory. I cannot support a re-conductoring solution at this time, since it addresses the symptom and not the cause. If trees are known to be the cause of events, then the Company's vegetation management practices should be evaluated to determine if robust right way clearing and hazard tree removal can resolve the issue at a lower cost. The Company agreed to consult with its vegetation

management team to reassess options. Conversations with the Company resulted in deferral of the project and reduction of $1.1 million in the Reliability category. Obviously, landowners will need to be more cooperative in allowing the Company to create an adequately cleared right-of-way.

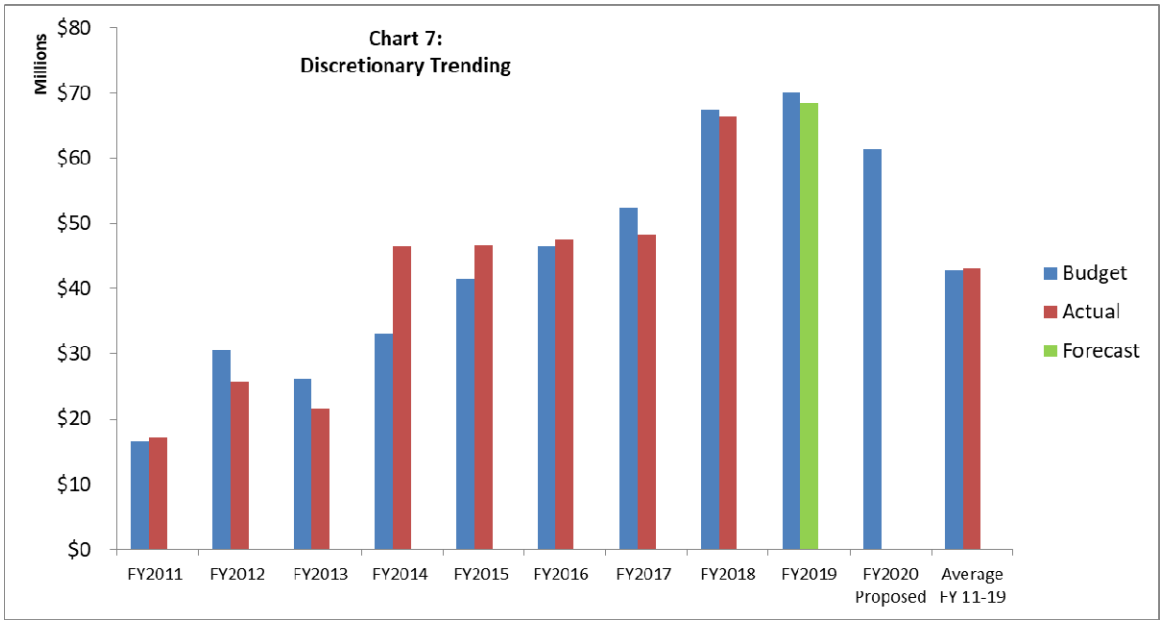
Remaining Reliability projects consist of smaller initiatives in the Other Load Relief and Reliability category, along with EMS/RTU expansion, overhead transformer replacement, substation protection for reverse flow from distributed generation ("3VO"), and blanket projects. My evaluation of Reliability projects, similar to previous years, produces a recurring observation that the Company is pursuing projects within the ISR Plan that originate from multiple and unrelated external initiatives. The Company may be recovering capital requirements outside the ISR, or the external initiative may result in projects within the ISR. To the extent the project enters the ISR, I will continue to analyze the proposed scope and spend, taking into consideration the following:

- Confirm that the proposed project is approved for inclusion in the ISR if required by an external initiative, such as studies, regulatory proceedings, or legislative actions,
- Determine whether the proposed project compliments or conflicts with other ISR Plan projects,
- Verify alignment with Area Studies,
- Verify that the proposed project takes into account similar studies performed by the Company to leverage "lessons learned" and avoid duplicative costs,
- Determine reasonableness of budget and impact on current and future years, and
- Identify ISR Plan work that may be deferred by the project.

As I noted in my FY 2019 ISR Plan review, these factors are difficult to differentiate during a single ninety (90) day annual review. I firmly believe that more frequent dialogue with the Division and the Company is necessary to keep apprised of external initiatives that result in ISR Plan projects. Recurring meetings should be established to discuss the status of various programs and policies, regulatory proceedings, or legislative actions that ultimately influence the ISR Plan. An ongoing, collaborative approach will serve to keep the Division apprised of the Company's activities, and provide a platform to not only discuss alignment of multiple initiatives, but also address any planning deficiencies. I discuss the Company's efforts to address these recommendations in more detail in Section G.

My review of the remaining Reliability projects resulted in concurrence for all proposed programs and associated budgets. Minor adjustments and a $1.1 million deferral for a Storm Hardening project resulted in a total proposed budget of $5 million in the Reliability category. This brings the budget for discretionary projects to $21.1 million in the System Capacity and Performance category for FY 2020.

Through the course of discussions and data analysis, concurrence was reached on a total proposed discretionary budget of $61.3 million comprised of the Asset Condition, Non-Infrastructure, and System Capacity & Performance categories, or sixty (60%) of the total Capital Investment of the ISR Plan budget (Chart 7).



G. Area Studies and Integrated Planning Requirements

A significant portion of my ISR Plan evaluation has been dedicated to the Company's need to evaluate projects against the results of Area Studies with a resulting system Long Range Plan before inclusion in the ISR Plan. In response, the Company is in the fifth year of performing Area Studies to be used to support projects in the ISR Plan. There are ten study areas and only three completed studies. As discussed earlier in this report, the first major projects compelled by completed Area Studies are now in the ISR Plan. The Company continues to advance remaining studies. The status of that progress was provided in the FY 2019 ISR Plan filing as follows:

National Grid's Study Areas: Current Priority and Statistics

Rank	Study Area	Load (MVA)	% State Load	# of Feeders	# of Stations	Study Status
1	Providence	364	19%	95	17	100%
2	East Bay	157	8%	23	7	100%
3A	Blackstone Valley North	145	7%	20	5	50%
3B	North Central RI	254	13%	35	10	50%
4	Central RI East	197	10%	38	10	100%
5	South County East	184	10%	21	9	85%
6	Central RI West	178	9%	30	11	
7	Newport	136	7%	54	14	
8	Blackstone Valley South	198	10%	60	13	
9	Tiverton	30	2%	4	1	
10	South County West	97	5%	12	6	
	Total:	**1,940**	**100%**	**392**	**103**	**56%**

* Study Status Total = % State Load Weighted Total

The Company provided the following update in the FY 2020 ISR Plan filing:

National Grid's Study Areas: Current Priority and Statistics

Rank	Study Area	Load (MVA)	% State Load	# Feeders	# Stations	Study Status
1	Providence	364	19%	95	17	100%
2	East Bay	157	8%	23	7	100%
3A	Blackstone Valley North	145	7%	20	5	50%
3B	North Central Rhode Island	254	13%	35	10	50%
4	Central Rhode Island East	197	10%	38	10	100%
5	South County East	184	10%	21	9	95%
6	Central Rhode Island West	178	9%	30	11	
7	Newport	136	7%	54	14	
8	Blackstone Valley South	198	10%	60	13	
9	Tiverton	30	2%	4	1	
10	South County West	97	5%	12	6	
	TOTALS*	1940	100%	392	103	57%

The only difference after an entire year is that South County East is ten percent (10%) closer to completion. There are several mitigating factors, such as the rate case, Power Sector Transformation and Grid Modernization issues. In its pre-file report, the Company does state that the South County East study documented a number of potential non-wires alternatives ("NWA"). The Company has since released NWA

Requests for Proposals to determine the economic viability of a NWA instead of a tradtional wires solution. Their course of action is consistent with the Division's strong encouragement to pursue NWA opportunities presented in Area Studies. In the last proceeding, I commented extensively on the Company's NWA evaluation deficiencies. The Company's collaboration with the Division to develelop a NWA RFP is a considerable step, and should serve as an excellent platform to gain a better understanding of NWA opporutnities. I also understand that the South County East Area Study cannot be completed until the NWA opportunity is fully vetted, but I am not conviced that the Company is making an earnest attempt to complete remaining studies in a timely manner. I expressed this concern in the FY 2019 ISR Plan proceeding and am disappointed that there has been very little advancement of Area Studies in the last year. There is nothing prohibiting the Company from commencing a future study while waiting for information to finalize a current study. The process does not have to be sequential. The rate at which studies are completed, delivered and reviewed with PowerServices and the Division continues to fall short of our expectations.

Lastly, in previous proceedings, I detailed several observations that impact the Company's ISR Plan, and raised concerns with the Company's efforts to manage those issues. In addition to delays in completing Area Studies, these generally include:

(a) Deficient NWA analyses,

(b) The lack of transparency and cohesiveness between the Company's design criteria, System Reliability Procurement, and Area Studies,

(c) The Company's lack of a grid modernization strategy and determination of how ISR projects either reflect or compliment that strategy.

Additionally, levels of complexity in distribution planning arise when considering the role and impact of distributed generation and legislative mandates, such as energy efficiency or reliability. In essence, the Company is tasked with creating a single, comprehensive capital investment plan to meet traditional safety and reliability objectives that must be compatible with multiple external initiatives today and in the future. I have discussed the confluence of these external initiatives and encouraged the Company to take a proactive stance in proposing improvements that integrate various planning requirements and allow for a transparent and forward-looking approach. While my recommendations have been endorsed by the Commission[9], the true resolution takes extensive collaboration and coordination between the Company, Commission Staff, Division, and stakeholders.

The Commission's findings and Order in the FY 2019 ISR added requirements that further these collaborative efforts. The Commission specifically "…ordered National Grid to work with PUC staff to develop a template document or cross program summary that would be provided with each proposal for rate recovery that included spending in more than one recovery factor or for programs that are related in scope. The PUC explained that it is not enough to simply state to the Commission that the proposals are aligned; there also needs to be an explanation to the Commission

[9] RIPUC Docket 4783, ISR Plan FY 2019 Proposal Report and Order (effective April 1, 2018); Order No. 6, pages 22-25

regarding how they are aligned. National Grid shall also provide a cost-benefit analysis by complying with the Docket No. 4600 Framework analysis in future ISR filings."[10]

The Company is now taking specific measures to meet Commission Orders, including my recommendations, in order to achieve a more holistic planning approach. For instance, the Company has participated in recurring meetings with the Division and stakeholders to improve the process of identifying NWA alternatives, and has released a RFP for solutions identified in an Area Study. This advances NWA analysis, and further improvements are expected. Concurrently, the Company states in its pre-file information that it plans to improve its existing study documentation process for core ISR projects by including more information on how programs, including regulatory and DERs, will be incorporated in the study. The Company has also committed to broader stakeholder engagement as grid modernization strategies develop that could potentially impact the ISR Plan[11]. I am satisfied with these initial endeavors, but reserve full endorsement until the Company produces studies that incorporate proposed improvements.

Consistent with the Commission's Order, the Company has also prepared a draft cross program template to show how "…a particular filing that is the subject of the PUC's review will impact other filings."[12] The Company is now identifying new or incremental programs in the proposed ISR Plan and describing how each advances,

[10] RIPUC Docket 4783, ISR Plan FY 2019 Proposal Report and Order (effective April 1, 2018); page 21
[11] Electric ISR Plan FY 2020 Proposal, Pre-filing Planning Information, August 9, 2018; pages 8-9.
[12] Electric ISR Plan FY 2020 Proposal, Pre-filing Planning Information, August 9, 2018; page 6.

detracts, or is neutral to each goal identified in Docket 4600. Although detailed benefit-cost analysis using the Docket 4600 Framework is still a work in progress, the Company has prepared a matrix to determine if projects accrue either costs or benefits under various categories. As the process is refined, those costs and benefits would be quantified. My evaluation of the ISR Plan does not include an analysis of projects with respect to Docket 4600 Framework goals, but I do believe that this work is a clear step toward both the Commission and Division objectives to synergize distribution planning. When considering these activities in tandem with the Company's efforts to improve study processes and NWA analysis, it appears the Company is beginning to formulate a more robust planning strategy that is an iterative, collaborative process throughout the year. As the planning process experiences transformations, I continue to evaluate the ISR Plan and budget as necessary to assure, to a reasonable degree, the avoidance of redundant costs between the ISR and other initiates. I also carefully evaluate the potential for early obsolescence to avoid as much capital investment being abandoned before it is fully depreciated or utilized to its end of expected life.

III. VEGETATION MANAGEMENT

The Company's initial FY 2020 ISR Plan proposed expenditures of $10.4 million for the Vegetation Management Program, which includes the Enhanced Hazard Tree Mitigation (EHTM) program, are six percent (6%) higher than the FY 2019 budget and forecasted spend of $9.8 million.

FY 2020 Proposed Budget	NG Initial Proposed Budget (10-4-18)	Adjustments	National Grid Proposed Budget (12-21-18)	FY 2019 Forecast
Vegetation Management				
Cycle Pruning	$ 5,600,000	$ -	$ 5,600,000	$ 6,150,000
Hazard Tree	$ 2,250,000		$ 2,250,000	$ 1,250,000
Sub-T	$ 500,000		$ 500,000	$ 325,000
Police/Flagman Detail	$ 825,000		$ 825,000	$ 850,000
All Other Activities	$ 1,225,000		$ 1,225,000	$ 1,225,000
Program Total	**$ 10,400,000**	**$ -**	**$ 10,400,000**	**$ 9,800,000**

Consistent with historical budgets, the major spending component is Cycle Pruning with a proposed budget of $5.6 million, which is lower than FY 2019 projected spend due to a higher number of rural miles cleared that had higher tree density. The Company forecasts a higher level of spend in the EHTM category, consistent with FY 2018, to manage increased tree mortality due to the spread of the Gypsy Moth throughout Rhode Island. The EHTM program will continue to be impacted in the future as the Company prepares a strategy to address pest-related tree damage, which I discuss in more detail below. Overall, the Company is successfully executing the Vegetation Management program while meeting budget targets. No adjustments were recommended, and concurrence was reached on the proposed Vegetation Management Program budget of $10.4 million for FY 2020.

I have evaluated the Vegetation Management Program in detail and on multiple levels in prior ISR Plan assessments, and continue to support the Company's funding level and frequency of cycle pruning work, which is consistent with industry practices. The Company reports[13] that, on average, a nineteen (19%) improvement in customer interruptions (CI) per circuit occurs in the first year after pruning. The Company implements a four-year pruning cycle to maintain approximately 5,006 miles of overhead distribution circuits. Reliability indices indicate that the Company continues to meet or exceed annual goals, suggesting that budget increases, unless warranted by upward pressure in contractor labor, are not required since the cycle pruning is not expanding or changing.

EHTM is another program component that the Company continues to perform and justify with favorable reliability statistics. The ISR Plan filing states[14] that three years of tree-related interruption data for Rhode Island indicates that fallen trees account for forty-six percent (46%)

CHART 8: Reliability Data

Rhode Island Customer Interrupted by Cause
Major Event Days Excluded
By Fiscal Year (2008-2018)

Cause	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Adverse Environment	1,673	5,651	4,018	5,992	3,674	6,584	811	6,786	5,922	10,108	8,576
Animal	15,103	16,303	14,751	15,335	15,008	9,864	10,098	21,232	32,266	31,931	17,356
Deteriorated Equipment	71,336	69,296	88,655	78,009	84,052	43,196	59,239	68,992	69,921	50,930	60,685
Human Element/Company	20,633	24,393	8,846	27,305	17,722	8,500	9,304	11,507	17,943	8,266	9,641
Human Element/Other	28,547	35,531	44,248	51,837	46,171	45,152	48,008	25,659	45,280	36,344	42,597
Intentional	50,735	36,569	59,581	33,987	41,879	42,989	44,451	55,268	54,661	67,444	62,978
Lightning	44,176	19,577	27,874	36,883	11,098	9,362	23,882	5,234	17,639	11,044	14,313
Substation	55,282	53,391	12,120	82,926	51,866	38,492	23,243	26,527	71,115	26,558	13,015
Sub-Transmission	24,298	31,628	22,243	39,770	29,805	44,084	53,550	26,191	33,727	33,741	28,224
Transmission	20,176	6,000	7,093	11,370	2,973	19,099	4,568	18,284	11,594	72,808	14,777
Tree	104,023	79,977	83,311	88,714	88,474	90,726	56,964	63,009	109,023	85,147	83,471
Unknown	29,583	26,146	15,807	29,629	29,163	34,143	18,501	23,529	35,829	34,689	23,395
Grand Total	**465,565**	**404,462**	**388,547**	**501,757**	**421,885**	**392,191**	**352,619**	**352,218**	**504,920**	**469,010**	**379,028**

[13] National Grid's Proposed FY 2020 Electric ISR; Section 3, page 2.
[14] National Grid's Proposed FY 2020 Electric ISR; Section 3: page 3.

of tree-related customer interruptions. Reliability data (Chart 8) shows that trees continue to account for a significant number of interruptions.

The EHTM program now accounts for twenty-two percent (22%) of the proposed Vegetation Management budget, as compared to previous years when it comprised less than ten percent (10%). The program has continuously been a source of annual discussions to better understand the cost/benefit of the program. Under the program, the Company identifies and removes dying or structurally weakened trees along the three-phase sections of the worst performing circuits. The Company is now expanding beyond the mainline portion of feeders that are experiencing multiple interruptions. The Company reports[15] that from FY 2008 to FY 2018, tree-related customer interruptions improved on an average of seventy percent (70%) for the first year following completion of EHTM work.

I continue to believe that hazard tree identification and removal, particularly on the worst performing feeders, remains critical. In the FY 2017 ISR Plan, the Company initially proposed increasing EHTM spend to manage the potential threat of the Emerald Ash Borer. I did not concur with the requested level of spend, and recommended that the Company continue to take steps to fully understand and devise a strategy for controlling or protecting from the Emerald Ash Borer before selectively identifying and removing hazard trees. The Company ultimately reported that the Emerald Ash Borer threat has not advanced, but requested a moderate increase of $300,000 in the FY 2018 Plan to manage tree mortality expected from spread of the Gypsy Moth. The Company requested and received the same funding level in the following plan year,

[15] National Grid's Proposed FY 2020 Electric ISR; Section 3: page 3.

and has been directed by the Commission to include a summary in its FY 2019 ISR quarterly reports of the Gypsy Moth and other pest-related damage tracked by the Company.

Review of the reports[16] indicate that the Company, as part of the EHTM program, has included select circuits with high concentration of Gypsy Moth infestation for tree removal. The Company is tracking the number of trees with suspected Gypsy Moth damage and the associated cost for removal. The Gypsy Moth related tree removal costs range from an average of $362 to $812 per tree. As a comparative statistic, the average cost under the EHTM program was nearly $1,100 per tree in FY 2018.

Table 3: Gypsy Moth Damaged Tree Removal Cost Comparison of FY 2018 and FY 2019

EHTM-Gypsy Moth Removals	FY 2018	FY 2019 (Q2)
No. Hazard Tree Removals	1,170	1,258
Suspected Gypsy Moth Trees	307	809
Gypsy Moth Spend	$ 249,131	$ 292,950
Avg. Cost/Gypsy Moth Tree	$ 812	$ 362

EHTM-Total Program	FY 2018
No. Hazard Tree Removals	1,170
Spend	$ 1,250,000
Cost/Tree	$ 1,068

The Gypsy Moth related data collection has been gathered from isolated areas and is in early stages. It shows a wide variation in the penetration of Gypsy Moth damage and cost of removal. As the Company collects additional statistics, that should serve as a foundation to estimate future, and potentially significant program costs. At this time, the Company estimates that there are around 25,000 oak trees in Rhode Island that have been impacted by the Gypsy Moth and that could impact the distribution system (National Grid Response to Data Request

[16] RIPUC Docket 4783, Gypsy Moth-Related Damage Report, April 20, 2018 and Quarterly Update; September 30, 2018.

DIV 2-3). The Company is continuing to collect information relative to the Gypsy Moth. Concurrent with these efforts, National Grid has conducted a study with a consulting firm to characterize the current state of the Emerald Ash Borer infestation and likely consequences to the electric system. (National Grid Response to Data Request DIV 2-3 Attachment). The study estimates that there are approximately 31,325 ash trees in proximity to distribution and sub-transmission lines in Rhode Island, and about half, or 15,663, are likely to impact the system once they are killed by the Emerald Ash Borer. The ash trees in proximity to the overhead system have a small stem diameter and are tall in stature, but are primarily located near streets and managed landscapes. Removal adds additional logistics such as coordination with municipalities, potential lengthy interactions with landowners, and the need for traffic control.

The report proceeds to outline consequences if no action is taken, mitigation concepts, and options. In summary, this detailed report unequivocally states that nearly "…29,760 ash trees will die and fall near National Grid's overhead distribution system in Rhode Island. As many as 15,240 of these trees will likely strike the lines." (National Grid Response to Data Request DIV 2-3 Attachment, page 19). The report estimates the cost of "doing-nothing" at $23.2 million for outage restoration and system repairs (National Grid Response to Data Request DIV 2-3 Attachment, page 15). It goes on to propose risk mitigation by removing hazard ash trees at an estimated cost of $15.5 million (National Grid Response to Data Request DIV 2-3 Attachment, page 19).

I am neither disputing nor concurring with the report statistics, but rather recognizing that the Company is on a trajectory of significant spending increases for tree removals. The Company is clearly facing important decisions in managing pest infestation and impacts to trees near power

lines. Both the Gypsy Moth and Emerald Ash Borer are posing risks, with the Emerald Ash Borer bringing much uncertainty regarding when damage and ultimate tree failure will occur. The Company states that the presence of Emerald Ash Borer was just confirmed in July 2018 in Washington County, Rhode Island, and also that no ash trees removed in the past three years have been infested. (National Grid Response to Data Request DIV 2-2). I have discussed these matters with the Company and have previously recommended a staged approach to mitigation. Proactively removing every potential oak or ash hazard tree is extremely expensive. Any statewide threat, such as pest infestation, must be managed collaboratively with all stakeholders, including federal, state, and local agencies. A strategic direction must be established and socialized such that there common understanding and agreement of the mitigation option, responsibilities, and cost assignment among all stakeholders. If National Grid takes an isolated approach to massive amounts of tree removal, the Company will surely meet resistance from agencies or localities that were not engaged. This would result in limited success and unnecessary costs. The only option is a statewide collaborative.

At this time, I agree that the Company's measured approach, spend, and reporting on Gypsy Moth are appropriate. I support the proposed FY 2020 EHTM budget of $2.3 million, which includes increased efforts for proactive oak tree removals due to the spread of the Gypsy Moth. The Company has not requested additional funding for the Emerald Ash Borer, but I anticipate that upcoming ISR Plan proposals will include significant increases for both the Gypsy Moth and Emerald Ash Borer. The magnitude of these budget needs are unknown. If tree removals reach current costs under the EHTM program, which average nearly $1,000 per tree, removing 25,000 oak and 15,240 ash trees could reach over $40 million. I expect that the Company will benefit from economies of scale and not reach this level, and that program increases will be allocated

over several years. When future ISR Plan budget requests are submitted, the Company should be prepared to reduce discretionary spend in other categories to offset vegetation management increases. Lastly, any budget request should be accompanied by a clear, collaborative statewide strategy, outlining the utility's role and estimated cost responsibility relative to other stakeholders.

The remaining components of Vegetation Management include sub-transmission work, police detail, and a general category for all other (core) activities. All categories are reasonable and consistent with recent historical levels of spend. This brings the total Vegetation Management Program proposed budget to $10.4 million.

IV. SUMMARY AND RECOMMENDATIONS

The process between the Company and the Division resulted in a FY 2020 Electric ISR Plan which sets forth a capital budget, VM Program and I&M Program, and associated O&M activities that balance the need for safety and reliability with efficient benefit/cost considerations. Appendix-2, Summary of Chart of Capital Outlays by Key Driver Category and Budget Classification, summarizes, by spending rationale (category) and individual budget class within each category, differences between the Company's initially proposed ISR Plan of October 4, 2018, and the resulting December 21, 2018 filing of the FY 2020 ISR Plan Proposal. The consensus ISR Plan is a two percent (2%) reduction of $750,000 in the non-discretionary capital spending budget and an eight percent (8%) reduction of $5.25 million in the discretionary capital spending budget, for an overall reduction of $6 million, or nearly six percent (6%).

For FY 2020, review of the proposed ISR Plan and discussions with the Company continued to address the reasonableness of budget levels for customary projects, many of which are part of mature programs. Overall, PowerServices supports ongoing investment in proposed categories and continues to monitor work performed under the non-discretionary category that may actually be discretionary. Evaluation of project details in both the Damage/Failure and Inspection & Maintenance program continues to raise concerns with the Company's classification of work between non-discretionary and discretionary categories. Discussions with the Company in prior years has failed to produce clear support for project rationale and cost allocation between these categories. I recommend that the Company and Division consider a method to combine and manage a discretionary budget for repairs completed in the Damage/Failure and I&M categories separately from a budget required to replace failed

equipment in the non-discretionary category. The Company's proposed FY 2021 ISR Plan should include budget categories, rationale, and proposed spend that reflect a consensus methodology.

The Company continues to pursue a portfolio of capital investments for load relief and to replace aging and obsolete infrastructure. Focus is shifting from small, individual projects to multi-year major projects. The Southeast Substation and Aquidneck Island projects dominate the current discretionary budget, and will be followed by many significant projects resulting from Area Studies being developed as part of a system Long Range Plan. Efforts to improve project management to meet scope and budgets have resulted in incremental improvements, but completion of Area Studies remains below expectations. Although the Company has advanced its first NWA RFP associated with an Area Study project, it has failed to complete any additional studies in the past year.

The number of programs external from the ISR Plan process continues to expand, and these programs are likely to require additional capital and O&M expenses. The Company, Division, and Commission Staff are working collaboratively with stakeholders to produce alignment among multiple initiatives, including the development of a grid modernization strategy. Much work will be needed to reach the ultimate goal of cohesiveness in the Company's integrated planning process in a manner that produces transparency in both the long term cost and benefit of programs.

The longer term challenge continues to be how the Company globally prioritizes and schedules projects arising from pending Area Studies, and other requirements arising from

separate but interrelated dockets while balancing competing interests of safety, reliability, NWA options benefit to cost, and economic impacts to its ratepayers. There will be significant upward pressure on the ISR Plan budget to accommodate future projects and the requirements of other initiatives, and the Company must be diligent in preparing and adhering to planning criteria that supports orderly development of the system. The Company must continue to monitor its core ISR Plan spending strategies, such as managing statewide pest infestation and hazard tree removals, which will require modulation of discretionary program spend to avoid excessive ISR Plan funding needs. Emphasis on creating a cohesive and transparent long-term planning process, combined with enhanced budgeting and project management, are critical to successful ISR Plan execution.

I support the FY 2020 ISR Plan Capital Budget as proposed at $101.8 million, the proposed Vegetation Management Program at $10.4 million and the I&M Program Operations and Maintenance Expenses at $1.2 million. I expect that my recommendations accepted during prior ISR Plan proceedings will continue to be followed by the Company, and I propose an additional recommendation that the Company and Division work to develop a methodology that combines the discretionary spend under Damage/Failure and I&M program.

Recommendations

1. National Grid and the Division shall consider a method to combine and manage a discretionary budget for repairs completed in the Damage/Failure and I&M categories separately from a budget required to replace failed equipment in the non-discretionary category. The Company's proposed FY 2021 ISR Plan should include budget categories, rationale, and proposed spend that reflect a consensus methodology.

2. National Grid shall develop an alignment between various planning and project evaluation processes, with consideration as to how a grid modernization strategy may be incorporated. This includes, but is not limited to, the SRP, Area Studies, ISR Plan, NWA options and internal Design Criteria.

3. National Grid shall propose a methodology to revise current and future study documents supporting Asset Replacement and System Capacity programs or projects as applicable to include, at minimum:
    - The traditional elements included in the Company's current studies including, but not limited to, purpose and problem statement, scope and program description, condition assessment/criticality rankings, alternatives considered, solution, cost and timeline.
    - Discussion on the impact to related Company initiatives, Commission programs, the various pilot projects, or other requirements driven by SRP, DSP, Heat Maps, and emerging initiatives.
    - A detailed comparison of recommendations to Area Studies to determine if solutions are aligned with study outcomes, noting adjustments required to avoid redundancy in planning.
    - An evaluation of potential incremental investments that support the Company's long term grid modernization strategy. This includes description of technology or infrastructure investment, cost benefit to traditional safety and reliability objectives, and additional operational benefits achieved if implemented.
    - A robust NWA evaluation for projects passing initial screening that clearly identifies alternatives considered, costs, and benefits.

4. National Grid shall continue to develop a System Capacity Load Study and a 10-year Long Range Plan in order to increase the level of support and transparency for the capital budget. The Company shall submit and present the outcome of Area Studies to the Division and its consultant at the time of completion. These studies shall include a separate Non-Wire Alternative analysis of the projects consistent with the requirements of other program commitments. The Company shall submit a report with updates on modeling activities and Area Study status at least 120 days prior to filing its FY 2021 ISR Plan Proposal, but in any event no later than August 31, 2019.

5. National Grid shall manage major Asset Replacement and System Capacity & Performance project budgets separate from other discretionary projects, such that any budget variances (underspend) will not be utilized in other areas of the ISR Plan. The Company shall provide quarterly budget and project management reports.

6. National Grid will continue to manage (underspend/overspend management) individual project costs within the ISR Plan discretionary category (comprised of Asset Condition and System Capacity and Performance projects), such that total portfolio costs are aligned within a discretionary budget target that excludes major substation projects.

7. National Grid shall continue to provide quarterly reporting on Damage/Failure expenditures to include the details of completed projects by operating region. The Company will separately identify Level I projects repaired as a result of the I&M program.

8. National Grid shall continue to provide a detailed budget for System Capacity & Performance and Asset Condition in order to provide transparency on a project level basis for the current and future 4-year period. The budget shall be provided in advance of the FY 2021 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

9. National Grid shall submit an evaluation of future proposed Asset Condition projects as compared to the Company's Long Range Plan in advance of the FY 2020 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

10. National Grid shall continue to submit its detailed substation capacity expansion plans and load projections, and include an evaluation of proposed projects against the Company's Long Range Plan, in advance of the FY 2021 ISR Plan Proposal filing, but in any event no later than August 31, 2019.

11. National Grid shall continue to submit a cost-benefit analysis on the Vegetation Management Cycle Clearing Program and a separate cost-benefit analysis on the Enhanced Hazard Tree Management program for the Division's review prior to submitting the Company's FY 2021 ISR Plan Proposal, but in any event no later than August 31, 2019.

12. National Grid shall continue to submit its Metal-Clad Switchgear replacement program cost-benefit analysis to the Division prior to submitting the Company's FY 2021 ISR Plan Proposal to the extent any Metal-Clad Switchgear replacements or major upgrades are proposed, but in any event no later than August 31, 2019.

APPENDIX 1

Historical Budgets versus Actual

Spending Rationale	FY 2006 Budget	FY 2006 Actual	FY 2007 Budget	FY 2007 Actual	FY 2008 Budget	FY 2008 Actual
Customer Request/Public Requirements	20,302,000	22,885,193	17,902,500	21,012,048	24,630,000	23,887,492
Damage/Failure	3,250,000	8,264,656	4,550,000	7,442,272	5,660,000	7,642,277
Total Discretionary	***23,552,000***	***31,149,849***	***22,452,500***	***28,454,320***	***30,290,000***	***31,529,769***
Asset Condition	9,323,000	5,828,465	8,641,000	8,342,907	10,020,000	12,559,436
Non-Infrastructure	793,000	(2,196,297)	990,000	3,041,061	75,000	385,109
System Capacity & Performance	10,276,500	10,980,393	12,961,500	11,545,608	12,434,000	13,558,424
Total Non-Discretionary	***20,392,500***	***14,612,561***	***22,592,500***	***22,929,576***	***22,529,000***	***26,502,969***
Grand Total	**43,944,500**	**45,762,410**	**45,045,000**	**51,383,896**	**52,819,000**	**58,032,738**
Vegetation Management	-	-	-	-	-	6,630,000
Inspection & Maintenance Program	-	-	-	-	-	-

Spending Rationale	FY 2009 Budget	FY 2009 Actual	FY 2010 Budget	FY 2010 Actual	FY 2011 Budget	FY 2011 Actual
Customer Request/Public Requirements	24,022,668	21,171,756	23,726,000	19,311,885	21,014,000	14,631,340
Damage/Failure	6,596,000	8,345,442	7,919,000	9,031,133	9,365,000	13,194,101
Total Discretionary	***30,618,668***	***29,517,198***	***31,645,000***	***28,343,018***	***30,379,000***	***27,825,441***
Asset Condition	10,090,732	10,941,238	14,253,000	13,065,303	7,201,000	5,830,800
Non-Infrastructure	242,600	284,808	168,000	(590,138)	685,000	705,603
System Capacity & Performance	16,707,000	14,595,922	22,434,000	17,454,290	8,635,000	10,758,714
Total Non-Discretionary	***27,040,332***	***25,821,968***	***36,855,000***	***29,929,455***	***16,521,000***	***17,295,117***
Grand Total	**57,659,000**	**55,339,166**	**68,500,000**	**58,272,473**	**46,900,000**	**45,120,558**
Vegetation Management	-	7,857,000	-	6,882,000	-	4,829,000
Inspection & Maintenance Program	-	-	-	-	-	-

Spending Rationale	FY 2012 Budget	FY 2012 Actual	FY 2013 Budget	FY 2013 Actual	FY 2014 Budget	FY 2014 Actual
Customer Request/Public Requirements	21,636,500	13,075,154	20,006,000	10,410,223	16,509,000	17,137,642
Damage/Failure	9,705,000	12,992,859	10,422,000	17,515,452	10,050,000	14,373,392
Total Discretionary	***31,341,500***	***26,068,013***	***30,428,000***	***27,925,675***	***26,559,000***	***31,511,034***
Asset Condition	12,318,050	11,520,099	11,863,000	8,070,832	20,242,000	20,904,838
Non-Infrastructure	278,000	266,545	336,000	2,269,065	255,000	(346,246)
System Capacity & Performance	17,962,450	13,955,240	13,913,000	11,249,210	12,544,000	25,972,338
Total Non-Discretionary	***30,558,500***	***25,741,884***	***26,112,000***	***21,589,107***	***33,041,000***	***46,530,930***
Grand Total	**61,900,000**	**51,809,897**	**56,540,000**	**49,514,782**	**59,600,000**	**78,041,964**
Vegetation Management	9,826,000	8,176,000	8,256,000	8,248,749	8,476,000	8,529,815
Inspection & Maintenance Program	2,479,230	1,465,884	2,270,900	1,480,205	3,779,000	3,611,958

Historical Budgets versus Actual (Continued)

Spending Rationale	FY 2015 Budget	FY 2015 Actual	FY 2016 Budget	FY 2016 Actual	FY 2017 Budget	FY 2017 Actual
Customer Request/Public Requirements	14,537,000	17,759,797	15,647,000	17,412,295	19,450,550	20,232,661
Damage/Failure	9,816,000	3,044,445	11,177,000	14,531,159	11,467,000	15,614,335
Total Discretionary	***24,353,000***	***20,804,242***	***26,824,000***	***31,943,454***	***30,917,550***	***35,846,996***
Asset Condition	19,511,000	25,140,871	24,053,000	27,178,961	33,280,427	31,274,161
Non-Infrastructure	277,000	1,216,345	275,000	457,389	275,000	621,795
System Capacity & Performance	21,759,000	25,889,850	22,148,000	19,919,705	18,968,000	16,370,536
Total Non-Discretionary	***41,547,000***	***52,247,066***	***46,476,000***	***47,556,055***	***52,523,427***	***48,266,492***
Grand Total	**65,900,000**	**73,051,308**	**73,300,000**	**79,499,509**	**83,440,977**	**84,113,488**
Vegetation Management	7,726,000	8,029,095	8,884,000	8,893,000	8,719,000	8,719,000
Inspection & Maintenance Program	2,995,000	2,022,743	3,333,000	1,196,756	1,611,750	1,611,750

Spending Rationale	FY 2018 Budget	FY 2018 Actual	FY 2019 Budget	FY 2019 Forecast	FY 2020 Proposed
Customer Request/Public Requirements	21,853,000	19,627,243	19,005,000	25,384,000	27,025,000
Damage/Failure	11,379,000	19,184,118	13,674,000	15,032,000	13,505,000
Total Discretionary	***33,232,000***	***38,811,361***	***32,679,000***	***40,416,000***	***40,530,000***
Asset Condition	42,744,000	17,241,994	29,768,000	28,899,000	39,675,000
Non-Infrastructure	553,000	362,242	556,000	508,000	550,000
System Capacity & Performance	24,092,000	50,642,444	39,764,000	39,039,000	21,045,000
Total Non-Discretionary	***67,389,000***	***68,246,680***	***70,088,000***	***68,446,000***	***61,270,000***
Grand Total	**100,621,000**	**107,058,041**	**102,767,000**	**108,862,000**	**101,800,000**
Vegetation Management	9,400,000	9,515,300	9,800,000	9,800,000	10,400,000
Inspection & Maintenance Program	1,230,800	684,744	1,289,000	1,289,000	1,243,000

APPENDIX 2

FY2020 ISR Plan PowerServices Adjustments Capital Outlays by Key Driver Category and Budget Classification					
		FY2020			
SPENDING RATIONALE	BUDGET CLASS	NG Revised Proposed Budget (10-4-18)	PowerServices Adjustments (12-14-18)	Notes	National Grid Proposed Budget (12-21-18)
Customer Request/ Public Requirements	3rd Party Attachments	165,000			165,000
	Distributed Generation	5,425,000	(750,000)		4,675,000
	Land and Land Rights - Dist	430,000			430,000
	Meters – Dist	3,030,000			3,030,000
	New Business - Commercial	7,140,000			7,140,000
	New Business - Residential	5,570,000			5,570,000
	Outdoor Lighting - Capital	150,000			150,000
	Public Requirements	2,350,000			2,350,000
	Transformers & Related Equipment	3,515,000			3,515,000
Customer Request/ Public Requirements		**27,775,000**	**(750,000)**		**27,025,000**
Damage/ Failure	Damage/ Failure (inc. Reserves)	11,855,000			11,855,000
	Major Storms – Dist	1,650,000			1,650,000
Damage/Failure Total		**13,505,000**	**-**		**13,505,000**
Subtotal Non-Discretionary		**41,280,000**	**(750,000)**		**40,530,000**
Asset Condition	Major Projects			(1)	
	South Street	1,800,000			1,800,000
	Southeast	6,250,000			6,250,000
	Flood - Westerly	315,000	(225,000)		90,000
	Flood - Hope Substation	750,000			750,000
	Dyer Street-Indoor Substation	4,900,000			4,900,000
	Providence LT Study	2,860,000			2,860,000
	Major Projects Total	16,875,000	(225,000)		16,650,000
	Asset Replacement				
	Battery Replacement	300,000			300,000
	Metalclad Switchgear	3,300,000			3,300,000
	Substation Transformer Replacement	180,000			180,000
	Substation Breakers & Reclosers	2,425,000			2,425,000
	Network Arc Flash	350,000			350,000
	Recloser Replacement	850,000			850,000
	RAPR				-
	URD Cable Strategy	5,500,000	(1,500,000)		4,000,000
	UG Cable Replacement	4,750,000			4,750,000
	UG Improvements	375,000			375,000
	Others	1,380,000			1,380,000
	Blanket Projects	3,415,000			3,415,000
	Asset Replacement Total	22,825,000	(1,500,000)		21,325,000
	Asset Replacement - I&M (NE)	4,125,000	(2,425,000)		1,700,000
Asset Condition Total		**43,825,000**	**(4,150,000)**		**39,675,000**
Non-Infrastructure	General Equipment	300,000			300,000
	Telecommunications Capital - Dist	250,000			250,000
Non-Infrastructure Total		**550,000**	**-**		**550,000**

FY2020 ISR Plan PowerServices Adjustments Capital Outlays by Key Driver Category and Budget Classification					
		FY2020			
SPENDING RATIONALE	BUDGET CLASS	NG Revised Proposed Budget (10-4-18)	PowerServices Adjustments (12-14-18)	Notes	National Grid Proposed Budget (12-21-18)
System Capacity and Performance	Load Relief			(1)	
	Aquidneck Island (Newport projects)	4,755,000			4,755,000
	Aquidneck Island (Jepson projects)	9,300,000			9,300,000
	New London Ave Substation #150	150,000			150,000
	Warren Substation	600,000			600,000
	East Providence Substation	1,280,000			1,280,000
	Load Relief Total	16,085,000	-		16,085,000
					-
	Reliability				-
	Volt/Var	1,850,000			1,850,000
	Storm Hardening	1,100,000	(1,100,000)		-
	EMS/RTU	310,000			310,000
	OH Line Transformer Replacement	600,000			600,000
	Other Load Relief & Reliability	665,000			665,000
	3VO	210,000			210,000
	Blanket Projects - SCP	1,325,000			1,325,000
	Reliability Total	6,060,000	(1,100,000)		4,960,000
System Capacity and Performance Total		**22,145,000**	**(1,100,000)**		**21,045,000**
Subtotal Discretionary		**66,520,000**	**(5,250,000)**		**61,270,000**
Total Electric Distribution		**107,800,000**	**(6,000,000)**		**101,800,000**
Vegetation Management Program	Cycle Trimming	5,600,000			5,600,000
	Hazard Tree	2,250,000			2,250,000
	Sub-T	500,000			500,000
	Police/Flagman Detail	825,000			825,000
	All Other Activities	1,225,000			1,225,000
Vegetation Management Program Total		**10,400,000**	**-**		**10,400,000**
Inspection and Maintenance Program	Operation and Maintenance Expenses:				
	Opex related to Capex	256,000			256,000
	Repair - Related Costs				-
	Inspections and Repair- Related Cost	515,000			515,000
	Removal Costs	136,000			136,000
	System Planning & Protection Coordination Study	25,000			25,000
	VVO/CVR Program O&M	311,000			311,000
Inspection and Maintenance Program Total		**1,243,000**	**-**		**1,243,000**
Grand Total ISR- All Programs		**119,443,000**	**(6,000,000)**		**113,443,000**

NOTES:

(1) National Grid will manage (underspend/overspend management) on individual project costs within the ISR plan discretionary category (comprised of Asset Condition and System Capacity and Performance projects) such that total portfolio costs are aligned within a Discretionary Budget Target that excludes major projects.