

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
PUBLIC UTILITIES COMMISSION**

The Narragansett Electric Company  
d/b/a National Grid  
R.I.P.U.C. Docket No. 4592  
RE: FY 2017 Electric Infrastructure,  
Safety, and Reliability Plan :

Docket No. 4592

**PREFILED DIRECT TESTIMONY OF**

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

**REDACTED**

February 12, 2016

Prepared by:  
Gregory L. Booth, PE



*Engineering And Management Services*

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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. 4592**

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**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. 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

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1 Electronics Engineers ("IEEE"), American Public Power Association ("APPA"),  
2 American Standards and Testing Materials Association ("ASTM"), the National Fire  
3 Protection Association ("NFPA"), and Professional Engineers in Private Practice  
4 ("PEPP"). I have also served as a member of the IEEE Distribution Subcommittee on  
5 Reliability and as an advisory member of the National Rural Electric Cooperative  
6 Association ("NRECA")-Cooperative Research Network, which is an organization  
7 similar to EPRI.

8 **Q. PLEASE BRIEFLY DESCRIBE YOUR EXPERIENCE WITH ELECTRIC**  
9 **UTILITIES.**

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

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

16 A. Yes. I have testified before the Rhode Island Public Utilities Commission on numerous  
17 matters, including Docket Nos. 2489, 2509, 2930, 3564, 3732, 4029, 4218, 4237, 4307,  
18 4360, 4382, 4473, 4539, and D-11-94. My testimony in Rhode Island has included filed  
19 and live testimony on previous Electric Infrastructure, Safety and Reliability Plan Fiscal  
20 Year Proposal filings by National Grid in Docket Nos. 4218, 4307, 4382, 4473, and 4539.

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

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1 A. I have testified before the FERC and numerous state commissions, including in  
2 Delaware, Florida, Maryland, Massachusetts, North Carolina, Pennsylvania, and  
3 Virginia.  
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1 **II. PURPOSE OF TESTIMONY**

2 **Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?**

3 A. The purpose of my testimony is to introduce *Exhibit GLB-1*, Report of Gregory L. Booth,  
4 PE on the review of National Grid's Proposed FY 2017 Electric Infrastructure, Safety and  
5 Reliability Plan dated September 22, 2015 ("ISR Plan"). My testimony will briefly  
6 summarize the collaborative process between the Division and National Grid, which  
7 resulted in the proposed ISR Plan filed December 9, 2015, together with summarizing the  
8 details of *Exhibit GLB-1* and my recommendations.

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**REDACTED****1 III. ISR PLAN EVALUATION PROCESS**

**2 Q. WOULD YOU BRIEFLY OUTLINE THE PROCESS WHICH LEADS TO THE**  
**3 DIVISION'S SUPPORT OF THE NATIONAL GRID ISR PLAN FILED ON**  
**4 DECEMBER 9, 2015 IN THIS DOCKET?**

**5 A. Yes.**

- 6 • An August 7, 2015, teleconference (Appendix-1 contains the Agenda for this**  
**7 meeting) was held between the Division, PowerServices, and the Company to discuss**  
**8 the planning process and the reports provided by National Grid in advance of the FY**  
**9 2017 ISR Plan filing ("Pre-Plan Information"). National Grid expressed the desire to**  
**10 file materials earlier than in prior years in an attempt to accelerate evaluation and,**  
**11 ultimately, the final filing in order to get PUC Plan approval earlier than in prior**  
**12 years.**
- 13 • On September 22, 2015, the Company filed the initial FY 2017 ISR Plan Proposal,**
- 14 • PowerServices evaluated the Pre-Plan Information and proposed ISR Plan and on**  
**15 October 7, 2015, provided Data Request No. 1,**
- 16 • On October 10, 2015, the Company provided the East Bay Study as part of the Pre-**  
**17 Plan materials,**
- 18 • On October 26, 2015, the Company provided a partial response to Data Request No.**  
**19 1,**
- 20 • On October 29, 2015, the Company provided remaining responses to Data Request**  
**21 No. 1,**
- 22 • On November 6, 2015, Data Request No. 2 was provided to the Company,**

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- 
- 1           • On November 10, 2015, the Division, PowerServices and the Company held a  
2           teleconference to discuss each spending category in detail, review responses to data  
3           requests, and clarify additional outstanding information,
- 4           • On November 17, 2015, the Company provided a partial response to Data Request  
5           No. 2,
- 6           • On November 23, 2015, the Company provided responses to all outstanding questions  
7           and Data Request No. 2, and provided updates to the FY2017 ISR Plan proposed  
8           budget for several components,
- 9           • On November 24, 2015, the Division, PowerServices and the Company held a  
10          subsequent teleconference to discuss data request responses and detailed information  
11          on the South Street substation project,
- 12          • On November 25, 2015, PowerServices provided proposed adjustments to the ISR  
13          Plan,
- 14          • On December 1, 2015, the Company provided responses to the proposed adjustments  
15          with rationale for acceptance or recommended changes,
- 16          • On December 2, 2015, PowerServices and the Company held a conference call to  
17          refine and finalize proposed adjustments which included specific conditions under  
18          which the Company would manage the South Street substation project and remaining  
19          discretionary projects,
- 20          • On December 3, 2015, the Division, PowerServices and the Company reached  
21          agreement on the proposed FY 2017 ISR Plan budget and conditions of budget  
22          management, and
- 23          • On December 9, 2015, the Company filed the Electric Infrastructure, Safety, and  
24          Reliability Plan FY 2017 Proposal.

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1 The following charts summarize the adjustments by category and the agreement reached  
 2 between the Division and National Grid, which are represented in National Grid's  
 3 December 9, 2015 filing:

<b>PROPOSED CAPITAL BUDGET by Spending Rationale</b>	<b>Initial FY2017 (9-22-15)</b>	<b>Net Adjustments</b>	<b>Final FY2017 (12-9-15)</b>
Customer Request/Public Requirements	\$ 19,450,550	\$ -	\$ 19,450,550
Damage/Failure Total	\$ 12,367,000	\$ (900,000)	\$ 11,467,000
<b>Subtotal</b>	<b>\$ 31,817,550</b>	<b>\$ (900,000)</b>	<b>\$ 30,917,550</b>
Asset Condition	\$ 37,244,427	\$ (3,964,000)	\$ 33,280,427
Non-Infrastructure	\$ 275,000	\$ -	\$ 275,000
System Capacity and Performance	\$ 20,663,000	\$ (1,695,000)	\$ 18,968,000
<b>Subtotal</b>	<b>\$ 58,182,427</b>	<b>\$ (5,659,000)</b>	<b>\$ 52,523,427</b>
<b>Grand Total</b>	<b>\$ 89,999,977</b>	<b>\$ (6,559,000)</b>	<b>\$ 83,440,977</b>

<b>PROPOSED VEGETATION MANAGEMENT BUDGET</b>	<b>Initial FY2017 (9-22-15)</b>	<b>Net Adjustments</b>	<b>Final FY2017 (12-9-15)</b>
Cycle Pruning	\$ 5,400,000	\$ (350,000)	\$ 5,050,000
Hazard Tree	\$ 1,250,000	\$ (300,000)	\$ 950,000
Sub-T	\$ 780,000		\$ 780,000
Police/Flagman Detail	\$ 850,000		\$ 850,000
All Other Activities	\$ 1,400,000	\$ (175,000)	\$ 1,225,000
<b>Program Total</b>	<b>\$ 9,680,000</b>	<b>\$ (825,000)</b>	<b>\$ 8,855,000</b>

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**IV. COMMENTS ON WITNESS TESTIMONY**

**Q. HAVE YOU REVIEWED THE PRE-FILED TESTIMONY OF JAMES H. PATTERSON, JR. AND RYAN A. MOE?**

A. Yes.

**Q. WOULD YOU PROVIDE ANY COMMENTS YOU HAVE IN REGARD TO THE FILED TESTIMONY OF THESE TWO WITNESSES?**

A. Yes. The testimony of Mr. Patterson and Mr. Moe accurately reflects the FY 2017 ISR Plan which the Division and PowerServices concurred would be an appropriate balance between system reliability and cost to enable National Grid to maintain a safe and reliable electric distribution system for its Rhode Island customers. Consensus was reached after thorough evaluation of the Company's FY 2016 ISR Plan quarterly reports and FY 2017 ISR Pre-filing Planning documents which customarily include detailed budgets, cost/benefit analysis, and additional information to support both ongoing programs and individual projects. A single significant project, South Street substation rebuild, comprises eighteen (18%) of the proposed FY 2017 ISR Plan budget. This significant project, along with major projects proposed in future ISR Plans, prompted extensive discussions regarding the Company's practice of re-phasing projects to meet an overall discretionary budget target rather than successfully managing individual projects to their specific budget. Throughout this process, I emphasized the Company's need to improve scopes, cost estimates, and ongoing project management, particularly for major projects, in order to effectively administer a \$90 million ISR Plan budget. This resulted in recommendations that the Company manage the South Street budget independently of other discretionary projects and that future detailed quarterly reports be provided to monitor progress and better track scope and cost variances.

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Most importantly, the Company is implementing several measures to improve scopes and budgets prior to a project being included in the ISR Plan. I expect, and the Division concurs, that the Company's proposal will vastly improve project estimates and schedules on the front end of the planning cycle and should enable better success in managing annual budget targets in the future. Further, improved estimating should reduce the level of annual ISR Plan reconciliation rate adjustments which have cast doubt on the effectiveness of the annual ISR Plan process.

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1 **V. REPORT SUMMARY**

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

4 A. The report contains an Introduction describing the overall process and summarizing the  
5 adjustments which resulted in a consensus for the FY 2017 ISR Plan Proposed Budget of  
6 \$83,440,977 for capital items and proposed a Vegetation Management Program expense  
7 budget of \$8,855,000. The *Exhibit GLB-1* report section on the Capital Investment Plan  
8 discusses in detail each major category: Customer Request/Public Requirements, ; Asset  
9 Condition; Non-Infrastructure; System Capacity and Performance; Vegetation  
10 Management; and Inspection and Maintenance expenses, outlining the issues considered,  
11 the adjustments proposed, and the reasoning for the adjustments as accepted by National  
12 Grid. A detailed summary chart contained in *Exhibit GLB-1* as Appendix-3 shows each  
13 Spending Rationale and Budget Class with the September 2015 initial proposed budget,  
14 net adjustments, our recommended budget, and the December 9, 2015 Filed Proposed  
15 Budget.

16  
17 The report contains a conclusion which supports the FY 2017 ISR Plan Proposal Budget  
18 as filed by National Grid on December 9, 2015. The conclusion includes ten (10)  
19 recommendations for the capital investment and vegetation management portions of the  
20 ISR Plan. Emphasis remains on the need for the Company to complete System Capacity  
21 Studies and utilize Long Range Plans to support major projects. Specific  
22 recommendations arising from this FY 2017 ISR Plan evaluation include a request for the  
23 Company to provide detailed quarterly reporting on non-discretionary projects.  
24 Additionally, as a result of the magnitude of the South Street substation rebuild project, it

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1 is recommended that the Company separately manage the South Street budget, that  
2 variances in South Street may not be used in other areas of the Plan, and that the  
3 Company should target an overall discretionary budget that excludes the South Street  
4 dollars.

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1 **VI. CONCLUSION**

2 **Q. DO YOU AND THE DIVISION SUPPORT THE NATIONAL GRID FY 2017**  
3 **ELECTRIC ISR PLAN PROPOSAL FOR \$83,440,977 IN BUDGETED CAPITAL**  
4 **EXPENDITURES, WITH \$8,855,000 IN VEGETATION MANAGEMENT**  
5 **EXPENSES AND \$1,291,750 IN INSPECTION AND MAINTENANCE**  
6 **EXPENSES?**

7 A. Yes, we did reach agreement on all cost components and, ultimately, a seven percent  
8 (7%) decrease in the Company's initially proposed capital budget and a nine percent  
9 (9%) decrease in the Vegetation Management budget.

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

12 A. The ten (10) recommendations related to capital investment and vegetation management I  
13 have provided in my *Exhibit GLB-1* report are summarized in the following list, and are  
14 provided with additional discussion in the Summary and Recommendations section of my  
15 report.

16 1. National Grid shall continue to develop a System Capacity Load Study and a 10-year  
17 Long Range Plan in order to increase the level of support and transparency for the  
18 capital budget. The Company shall submit a report with updates on modeling  
19 activities in addition to the proposed Long Range Plan (completed portions) at least  
20 120 days prior to filing its FY 2018 ISR Plan Proposal, but in any event no later than  
21 August 31, 2016. This should be continued with each subsequent ISR Plan process.  
22 There is some support for considering the planning process review as a separate  
23 activity from the ISR Plan, allowing increased efficiency in future ISR Plan process  
24 and Division review.

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2. National Grid shall manage the South Street FY 2017 ISR Plan budget separate from other discretionary projects, such that any budget variances (underspend) will not be utilized in other areas of the Plan. The Company shall provide quarterly budget and project management reports.
3. National Grid will manage (underspend/overspend management) individual project costs within the FY 2017 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 South Street. The FY 2017 discretionary budget target will be \$37,163,427 (equivalent to the total discretionary budget of \$52,523,427 less the South Street budget of \$15,360,000).
4. National Grid shall 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.
5. 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 2018 ISR Plan Proposal filing, but in any event no later than August 31, 2016.
6. 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 2018 ISR Plan Proposal filing, but in any event no later than August 31, 2016.
7. National Grid shall continue to submit its detailed substation capacity expansion plans and load projections, and include an evaluation of proposed projects against the

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1 Company's Long Range Plan, in advance of the FY 2018 ISR Plan Proposal filing,  
2 but in any event no later than August 31, 2016.

3 8. National Grid shall continue to submit a cost-benefit analysis on the Vegetation  
4 Management Cycle Clearing Program and a separate cost-benefit analysis on the  
5 Enhanced Hazard Tree Management program for the Division's review prior to  
6 submitting the Company's FY 2018 ISR Plan Proposal, but in any event no later than  
7 August 31, 2016.

8 9. National Grid shall continue to submit its Metal-Clad Switchgear replacement  
9 program cost-benefit analysis to the Division prior to submitting the Company's FY  
10 2018 ISR Plan Proposal, but in any event no later than August 31, 2016.

11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]  
14 [REDACTED]

15 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

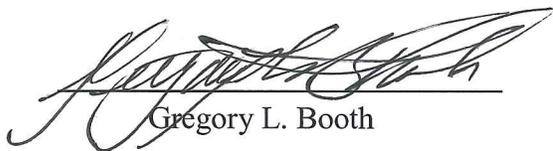
16 A. Yes.

**AFFIDAVIT OF GREGORY L. BOOTH, PE**

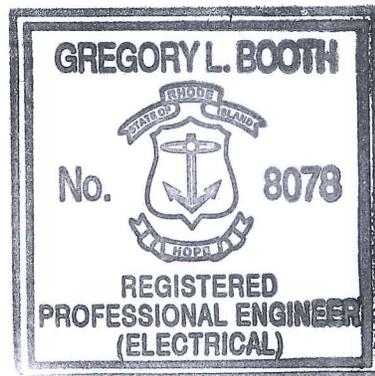
Gregory L. Booth, does hereby depose and say as follows:

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 12<sup>th</sup> day of February, 2016.

  
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

**EXHIBIT GLB-1**

**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 2017 Electric Infrastructure, Safety, and Reliability Plan  
Docket No. 4592**

**REDACTED**

**February 12, 2016**



*Engineering And Management Services*

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gbooth@powerservices.com

## ***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 2017 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, 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 consensus 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 2017 Electric Infrastructure, Safety, and Reliability Plan  
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**I. INTRODUCTION**

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PowerServices, Inc. (“PowerServices”<sup>1</sup>) 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 2017 Proposal (the “ISR Plan” or “Plan”) dated September 22, 2015, and the final Electric Infrastructure, Safety, and Reliability Plan FY 2017 Proposal dated December 9, 2015 and filed in Docket 4592. The evaluation followed the same process of analysis completed for the FY 2012, FY 2013, FY 2014 ISR, FY 2015 ISR and FY 2016 ISR Plans. This Report will include an explanation of the process for the initial FY 2017 ISR Plan proposal evaluations and collaborative efforts, resulting in a reduction of proposed FY 2017 capital spending in several areas, including Customer Request/Public Requirements, capital expenses for asset replacement and load relief projects, and operation & maintenance (“O&M”) expenses for Vegetation Management (“VM”). The reductions were applied to the proposed spending levels in the Company’s initial FY 2017 ISR Plan Proposal submitted to the Division September 22, 2015, and are reflected in the subsequent FY 2017 ISR Plan Proposal dated December 9, 2015. 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.” This process ultimately resulted in the Division and the Company reaching agreement on an appropriate level of the capital spending and O&M expenses for FY 2017 to be included in what is now the Company’s filing of an Electric ISR Plan in Docket No. 4592.

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<sup>1</sup> For the purposes of this report, reference to “PowerServices”, “I”, and “my” are interchangeable.

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The Company's initial proposed September 22, 2015 FY 2017 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, and the Company generally met the guidelines used to reach agreement for the cost during the last evaluation process.

PowerServices performed its evaluations by reviewing the Company's pre-plan information along with the proposed ISR Plan. The pre-plan information is guided by Division recommendations, and the Rhode Island Public Utilities 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, and other supplemental information. The Company's quarterly updates for the FY 2016 ISR Plan were also utilized to provide trending analysis and benchmarks for proposed levels of spending. An in-depth analysis of the pre-plan information and each component of the proposed FY 2017 ISR Plan was undertaken. The evaluation and analysis process was performed, including the following actions and procedures:

1. An August 7, 2015, teleconference (Appendix-1 contains the Agenda for this meeting) was held between the Division, PowerServices, and the Company to discuss the planning process and the reports provided by National Grid in advance of the FY 2017 ISR Plan filing ("Pre-Plan Information"). National Grid expressed the desire to file materials earlier than in prior years in an attempt to accelerate evaluation and, ultimately, the final filing in order to get PUC Plan approval earlier than in prior years.
2. On September 22, 2015, the Company filed the initial FY 2017 ISR Plan Proposal,

3. PowerServices evaluated the Pre-Plan Information and proposed ISR Plan, and on October 7, 2015 provided Data Request No. 1,
4. On October 10, 2015, the Company provided the East Bay Study as part of the Pre-Plan materials,
5. On October 26, 2015, the Company provided a partial response to Data Request No. 1,
6. On October 29, 2015, the Company provided remaining responses to Data Request No. 1,
7. On November 6, 2015, Data Request No. 2 was provided to the Company,
8. On November 10, 2015, the Division, PowerServices and the Company held a teleconference to discuss each spending category in detail, review responses to data requests, and clarify additional outstanding information,
9. On November 17, 2015, the Company provided a partial response to Data Request No. 2,
10. On November 23, 2015, the Company provided responses to all outstanding questions and Data Request No. 2, and provided updates to the FY 2017 ISR Plan proposed budget for several components,
11. On November 24, 2015, the Division, PowerServices and the Company held a subsequent teleconference to discuss data request responses and detailed information on the South Street substation project,
12. On November 25, 2015, PowerServices provided proposed adjustments to the ISR Plan,
13. On December 1, 2015, the Company provided responses to the proposed adjustments with rationale for acceptance or recommended changes,
14. On December 2, 2015, PowerServices and the Company held a conference call to refine and finalize proposed adjustments which included specific conditions under which the Company would manage the South Street substation project and remaining discretionary projects,

15. On December 3, 2015, the Division, PowerServices and the Company reached agreement on the proposed FY 2017 ISR Plan budget and conditions of budget management, and
16. On December 9, 2015, the Company filed the Electric Infrastructure, Safety, and Reliability Plan FY 2017 Proposal.

The overall analysis was an iterative process, which included detailed discussions of each ISR Plan spending rationale category, including Capital Expenditures, the VM Plan, and the Inspection and Maintenance (I&M) Plan, and the Company included each of its area experts in the discussions as we worked toward a final plan for FY 2017 which would have the support of the Division. This series of 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, were submitted to the Commission by National Grid on January 5, 2016.

The structure of the FY 2017 ISR Plan filing closely followed the FY 2016 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 2017 Plan continued the trend of significant discretionary spending levels for major construction projects initially observed in the FY 2016 Plan. One significant multi-year project, the South Street substation rebuild, prompted expanded discussions and additional data requests due to the scope and magnitude of the proposed budget.

Through the analysis and assessment process consensus on the rationale for adjustments and the final dollar levels was reached between the Division and the Company in all categories. Among the items utilized by the Company, the Division, and PowerServices in reaching a consensus were the quarterly reports<sup>2</sup> comparing the prior fiscal year ISR Plan proposed budgets to forecasted expenditures, together with the historical budgets and spending by category as reflected in Appendix-2. Additionally, there was substantial discussion concerning Damage/Failure trends, major Asset Replacement programs, I&M costs, System Capacity load relief projects, and the continued need for a comprehensive Long Range Plan. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] The FY 2017 ISR Plan, as adjusted during the evaluation process, is reflected in the Company's December 9, 2015 filing with the Rhode Island Public Utilities Commission. Appendix-3 lists a Summary of the Capital Outlays by key driver category and budget classification, as originally proposed by the Company on September 22, 2015, with net adjustments listed. The Division, PowerServices, and the Company agreed on all adjustments. Following is a detailed discussion of the categories and adjustments.

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<sup>2</sup> For this report, PowerServices referenced Docket 4539 – National Grid's Electric Infrastructure, Safety, and Reliability Plan Quarterly Update - Second Quarter Ending September 30, 2015 (for FY 2016 dated November 6, 2015)

**II. CAPITAL INVESTMENT PLAN**

A. Overview

I have evaluated the \$83,440,977 FY 2017 Capital Spending Plan proposed by the Company, along with its supporting testimony and exhibits as contained in its filing dated December 9, 2015. I first reviewed the initial proposed ISR Plan submitted to the Division dated September 22, 2015 in the amount of \$89,999,977. Over a period of approximately eleven (11) weeks, there was an iterative process in which modifications to the Company’s original proposed Capital Spending Plan were discussed. A consensus was reached concerning each of the Spending Rationales and the five (5) major categories. The following Table 1 is a comparison of the Company’s initial filed proposal in September 2015, net adjustments, and the Company’s proposed final budget as shown in Chart 7 of the FY 2017 ISR Plan as filed on December 9, 2015 in Docket No. 4592. The \$83.4 million is the consensus level reached through the evaluation process.

**Table 1: Proposed FY 2017 Capital Outlays by Key Driver Category**

<b>PROPOSED BUDGET by Spending Rationale</b>	<b>Initial FY2017 (9-22-15)</b>	<b>Net Adjustments</b>	<b>Final FY2017 (12-9-15)</b>
Customer Request/Public Requirements	\$ 19,450,550	\$ -	\$ 19,450,550
Damage/Failure Total	\$ 12,367,000	\$ (900,000)	\$ 11,467,000
<b>Subtotal</b>	<b>\$ 31,817,550</b>	<b>\$ (900,000)</b>	<b>\$ 30,917,550</b>
Asset Condition	\$ 37,244,427	\$ (3,964,000)	\$ 33,280,427
Non-Infrastructure	\$ 275,000	\$ -	\$ 275,000
System Capacity and Performance	\$ 20,663,000	\$ (1,695,000)	\$ 18,968,000
<b>Subtotal</b>	<b>\$ 58,182,427</b>	<b>\$ (5,659,000)</b>	<b>\$ 52,523,427</b>
<b>Grand Total</b>	<b>\$ 89,999,977</b>	<b>\$ (6,559,000)</b>	<b>\$ 83,440,977</b>

The Company projects the need for non-discretionary expenditures of \$19,450,550 in Customer Request/Public Requirements spending and \$11,467,000 in Damage/Failure

spending. The non-discretionary budget is approximately thirty-seven percent (37%) of the ISR Plan Capital requirements and fifteen percent (15%) higher than the FY 2016 budget. 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. For these reasons, it is reasonable that the Customer Request/Public Requirements will trend upward over time and, absent identification of major projects, incremental annual increases are expected.

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 and, in fact, spending in the Damage/Failure category continues to rise, excluding major storms which are unpredictable and variable. The upward trend in costs is influencing the overall non-discretionary category which is consistently exceeding annual targets for the past three years. The Company exceeded the FY 2014 Plan non-discretionary budget by 19%, exceeded the FY 2015 budget by 23%, and is positioned to exceed the FY 2016 budget by 28%. The Company had originally proposed a FY 2017 ISR budget for non-discretionary spending of \$31,817,550 and ultimately agreed to lower the FY 2017 budget for Damage/Failure based on extensive discussions related to the rationale for

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projects performed under the Ocean State Damage/Failure blanket. I will discuss the Damage/Failure category and cost trends for non-discretionary spending in more detail in Section C.

The remaining three (3) major categories of spending rationale for the FY 2017 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 \$52,523,427 for the remaining sixty-three percent (63%) of the proposed capital budget. One major project, South Street rebuild, comprises \$15.36 million or eighteen percent (18%) of the total ISR budget. In anticipation of significant projects, I had previously recommended the need for the Company to implement a System Capacity Load Study and develop a 10-year Long Range Plan in order to increase the level of support and transparency for the capital budget. The Company is complying by performing individual area studies that focus on the engineering rationale and alternative solutions for proposed projects. Although the studies have commenced, they do not specifically support the South Street project or other individual load relief projects. It has been agreed that the Company budget and complete all currently scheduled projects before adding future capital projects that are supported by system studies. The Company further agreed, as a condition of acceptance of the proposed budget, that the South Street budget will be managed separately from other discretionary projects such that any budget variances will not be utilized in other areas.

For the three categories (Asset Condition, Non-Infrastructure, and System Capacity and Performance), the initial proposed budget was \$58,182,427, which has been adjusted down to

\$52,523,427 in the final FY 2017 ISR Plan Proposal filing, based on the consensus 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 2017 ISR proposal to historical budgets and actual expenditures to provide 6-year trending analysis for both non-discretionary and discretionary categories.

**B. Customer Request/Public Requirements Category**

The initial proposed FY 2017 ISR Plan included \$19,450,550 of Customer Request/Public Requirements cost. This compares to a FY 2016 ISR budget and forecast of \$15,647,000 and \$16,487,000, respectively.

<b>Proposed Budget</b>	<b>Initial FY2017 (9-22-15)</b>	<b>Net Adjustments</b>	<b>Final FY2017 (12-9-15)</b>
Customer Request/Public Requirements	\$ 19,450,550	\$ -	\$ 19,450,550

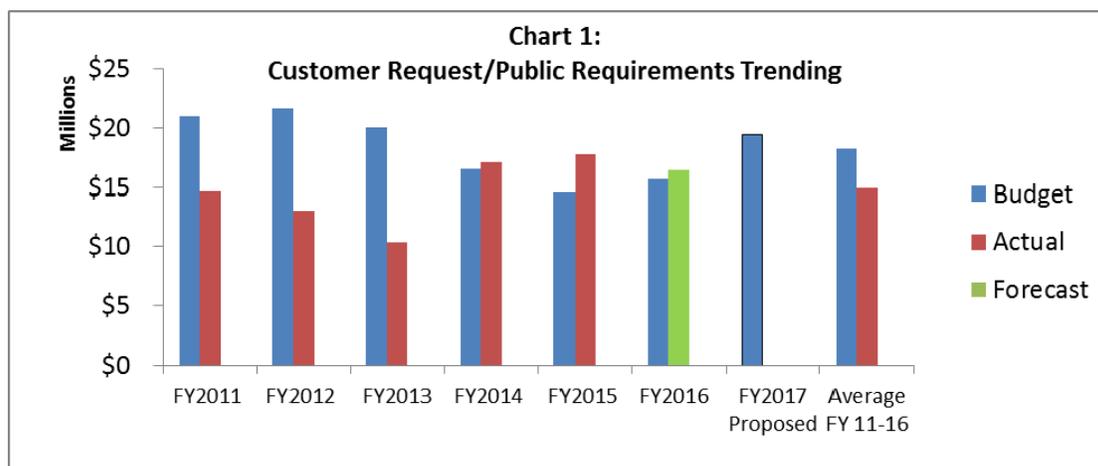
  

<b>Budget Variance</b>	<b>Filed FY2016</b>	<b>Over/(Under) Budget</b>	<b>FY2016 Forecast</b>
Customer Request/Public Requirements	\$ 15,647,000	\$ 840,000	\$ 16,487,000

Thus, the Company expects to exceed the Customer Requirements/Public Request budget by \$840,000 in FY 2016. According to the Company’s filing, the major drivers as of the second quarter are:

- \$1.4 million over-budget on New Business Residential and Commercial blankets due to project costs incurred for which customer reimbursements were received in FY 2015 as well as lower than expected reimbursements for FY 2016,
- \$1 million over-budget for the Meter Purchasing program due to an incorrectly applied credit that was reversed, and
- Over-budget forecasts for Nasonville 127W41 New Customer Load Project.

Offsetting these projects were under-budget blankets including transformers and street lighting. As shown in Chart 1 below, the Company has, on average, historically underspent in this category but there is an increasing trend of over-budget spend over the past three years.



The FY 2017 proposed budget is an increase of \$3 million over the FY 2016 forecast and predominantly driven by new commercial projects including a Liquefied Natural Gas (LNG) plant in Providence. Recognizing the need to fund residential and business driven expansions, no adjustments were recommended to the Customer Request/Public Requirements proposed budget. Although there are components of unplanned or emergent work in this category which the Company does not control, I will continue to examine projects to ensure that those performed for customers receive the appropriate Contribution in Aid of Construction (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, we will recommend against recovery from ratepayers.

In summary, there was no adjustment to the proposed budget of \$19,450,550 for the Customer Request/Public Requirements category, but recovery of costs absorbed by the

Company that would customarily be assigned to third parties may be challenged in future evaluations.

C. Damage Failure Category

The initial proposed FY 2017 ISR Plan included \$12,367,000 in the Damage/Failure category for non-discretionary costs to replace equipment that unexpectedly fails or becomes damaged. This compares to a FY 2016 ISR budget and forecast of \$11,177,000 and \$17,932,000 respectively.

Proposed Budget	Initial FY2017 (9-22-15)	PowerServices Adjustments	Final FY2017 (12-9-15)
Damage/Failure Total	\$ 12,367,000	\$ (900,000)	\$ 11,467,000

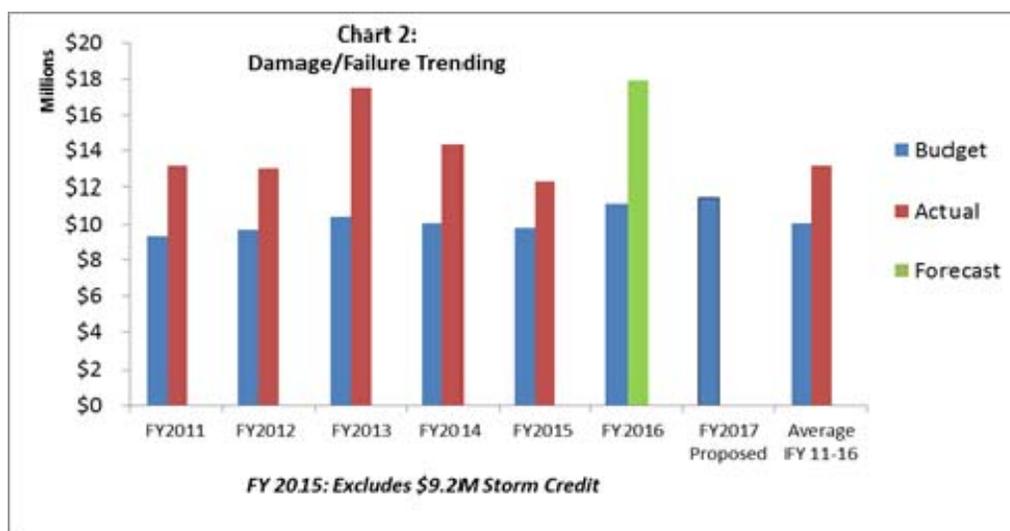
Budget Variance	Filed FY2016	Over/(Under) Budget	FY2016 Forecast
Damage/Failure Total	\$ 11,177,000	\$ 6,755,000	\$ 17,932,000

The Company anticipates a significant variance in FY 2016 totaling \$6.8 million which is 60% over-budget. According the Company’s filing, as of the second quarter, the Company is \$4.4 million over-budget due to:

- \$2.5 million in unanticipated costs from a severe August 4<sup>th</sup> microburst storm, and
- \$2.4 million additional spend in the Ocean State damage/failure from increased identification and replacement of assets by Operations in this blanket.

Similar to FY 2016, the FY 2017 Plan indicates the continuance of the Ocean State blanket project which comprises over 70% of the total budget. This blanket project covers costs to replace equipment that unexpectedly fails or becomes damaged and includes capital spending to address issues that have been identified for immediate repair as part of the I&M program.

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 Damage/Failure budgets versus actual spending (Chart 2) indicates that the Company's FY 2017 proposed budget is higher the historical average and that the Company is consistently overspending in this category.

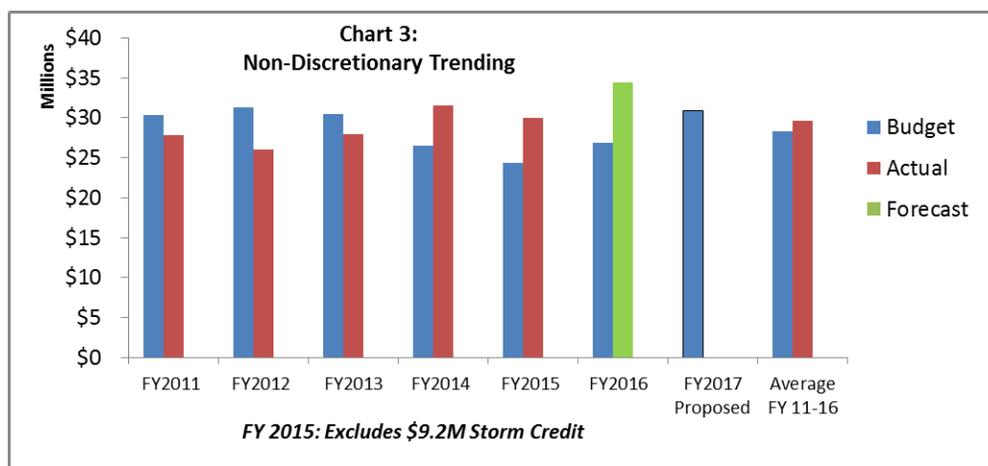


This trend was recognized in my FY 2016 report where I stated that the magnitude and frequency of variances revealed several areas of concern, including whether the Company was a) accurately reflecting costs; b) monitoring the type and level of work performed under the I&M program which influences the Damage/Failure expenses; and/or c) using appropriate methodologies to estimate the budget. For the FY 2017 Plan, detailed discussions on budget variances focused on the Ocean State blanket since it comprises the majority of the budget. Information on the type and cost of various construction projects performed under the blanket was requested of the Company. Analysis revealed that, in some cases, facilities or equipment identified by the field operations group for replacement under damage/failure were actually condition based and more discretionary in nature than non-discretionary. This suggests that the Company is classifying and advancing projects in the damage and failure

category that are not imminent. PowerServices did not recommend that specific projects be suspended at this time, but rather requested a budget reduction along with future reporting to aid in ongoing assessments. The Company complied by reducing the FY 2017 proposed budget by \$900,000 and agreed 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. The Damage/Failure report, commencing with FY 2016 third quarterly report, will better enable PowerServices to determine if projects are appropriately classified as non-discretionary and future budget adjustments or recommendations may result from evaluation of this material.

Upon conclusion of the evaluation, there is a \$900,000 adjustment to the Company’s proposed budget of \$12,367,000 in the Damage/Failure category resulting in a final budget of \$11,467,000. The Company will augment quarterly reporting by including additional detail on spending within the damage and failure category.

This brings the total non-discretionary categories of Customer Request/Public Requirements and Damage/Failure to \$30,917,550, which is 37% 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 represents a combination of strategies and programs targeting equipment replacement to maintain reliability performance. Spending is further divided into Asset Replacement and Inspection & Maintenance (I&M) components. The I&M Program is a result of successful transition of previous Feeder Hardening, Feeder Health, and associated Operation & Maintenance activities. The initial proposed budgets for the Asset Replacement and I&M programs were \$34,734,427 and \$2,510,000, respectively, bringing the total Asset Condition budget to \$37,244,427. This compares to the FY 2016 budget and forecasted actuals of \$24,053,000 and \$29,851,000 respectively.

Proposed Budget	Initial FY2017 (9-22-15)	PowerServices Adjustments	Final FY2017 (12-9-15)
Asset Condition	\$ 37,244,427	\$ (3,964,000)	\$ 33,280,427

Budget Variance	Filed FY2016	Over/(Under) Budget	FY2016 Forecast
Asset Condition	\$ 24,053,000	\$ 5,798,000	\$ 29,851,000

As highlighted in my FY 2016 report, the Company is embarking on a period of increased capital investment to replace aged and constrained major assets across the system. Last year, expenditures for significant asset replacement projects, in tandem with proposed projects in the System Capacity & Performance category (discussed in Section F), were projected to exceed \$100 million over five years. The Company's latest estimates now indicate that these categories are forecasted at nearly \$150 million over the next five years. For FY 2017, the Asset Condition budget is almost forty percent (40%) higher than the FY 2016 budget. This is also a pivotal year in that a single project (South Street) comprises forty-six percent (46%) or almost half of the entire budget. A detailed look at the Asset Condition budget (Table 2)

**EXHIBIT GLB-1**  
**REPORT OF GREGORY L. BOOTH, PE**

**REDACTED**

illustrates these trends and highlights the significance of proposed individual Asset Replacement Projects which were originally sanctioned at \$54 million but are now estimated at \$93.7 million.

**Table 2: Asset Condition Detailed Budget**

Asset Condition Category (\$000)	Total Current Estimate (Distribution)	Initial Estimate at time of First Sanction	FY16 ISR Budget	FY16 ISR Forecast	FY17 ISR Budget
Battery Replacement			200	171	411
Indoor Sub Replacement			179	-	25
Metalclad Replacement			1,540	3,404	2,285
Substation Transformers			795	152	956
T-Body			43	129	-
Relay Replacements			940	1,043	746
Substation Breakers & Reclosers			1,000	1,072	1,175
Network Arc Flash			600	85	598
RAPR			180	1	182
UG Cable			998	1,978	2,500
URD			2,500	2,500	2,500
Blanket Projects			2,179	2,252	2,805
Other Asset Replacement			1,073	1,157	449
Reserves			(2,600)	-	-
<b>Sub-Total Recurring Projects</b>			<b>9,627</b>	<b>13,945</b>	<b>14,632</b>
South St Station Rebuild	55,365,000	18,240,000	4,560	7,084	15,360
Eldred Substation Rebuild	3,874,000	2,857,000	-	35	-
New Southeast Sub	18,600,000	18,600,000	55	-	25
Langworthy Substation Rebuild (flood)	1,805,000	2,095,000	-	49	-
Memorial Blvd_Cable Relocation	1,430,000	1,430,000	730	824	532
Flood - Hope Substation	410,000		612	152	221
Flood - Pontiac	3,347,000	1,710,000	1,090	1,251	-
Flood - Warwick Mall Sub	850,000		24	70	-
Flood - Westerly	8,000,000	9,160,000	650	0	-
<b>Sub-Total Individual Projects</b>	<b>93,681,000</b>	<b>54,092,000</b>	<b>7,721</b>	<b>9,465</b>	<b>16,138</b>
<b>Asset Replacement - I&amp;M (NE)</b>			<b>6,705</b>	<b>6,200</b>	<b>2,510</b>
<b>TOTAL ASSET CONDITION</b>			<b>24,053</b>	<b>29,610</b>	<b>33,280</b>

Over the course of this ISR review, the Company and Division reached the consensus that this category should be adjusted downward by \$3,964,000 to \$33,280,427. Results of PowerServices' evaluation, the rationale for adjustments, and additional conditions requested of the Company are addressed separately between the Asset Replacement and I&M categories.

1. Asset Replacement

The Asset Replacement category contains multiple year individual projects along with recurring programs that have been included and reviewed in prior ISR Plan filings. Proposed budgets in this discretionary category are generally based on equipment condition, criticality rankings, and the Company's planned level of work. For FY 2017, the Company proposed budgets for customarily recurring programs including URD cable strategy, underground cable replacement, metalclad switchgear replacement, transformers, substation breakers and reclosers. The Company also budgeted for major specific projects expected to occur over multiple years such as substation rebuilds. The FY 2017 budget brings an overall increase in Asset Replacement along with a shift in budget allocation among major substation projects. To compare and contrast the suite of recurring programs versus individual projects, details of FY 2016 and FY 2017 Asset Replacement projects are shown in the following Table 3.

**Table 3: Asset Replacement Projects Detail**

<b>Asset Replacement Projects (\$000)</b>	<b>FY16 ISR Budget</b>	<b>FY16 ISR Forecast</b>	<b>FY17 ISR Budget</b>
Battery Replacement	200	171	411
Indoor Sub Replacement	179	-	25
Metalclad Replacement	1,540	3,404	2,285
Substation Transformers	795	152	956
T-Body	43	129	-
Relay Replacements	940	1,043	746
Substation Breakers & Reclosers	1,000	1,072	1,175
Network Arc Flash	600	85	598
RAPR	180	1	182
UG Cable	998	1,978	2,500
URD	2,500	2,500	2,500
Blanket Projects	2,179	2,252	2,805
Other Asset Replacement	1,073	1,157	449
Reserves	(2,600)	-	-
<b>Sub-Total Recurring Projects</b>	<b>9,627</b>	<b>13,945</b>	<b>14,632</b>
South St Station Rebuild	4,560	7,084	15,360
Eldred Substation Rebuild	-	35	-
New Southeast Sub	55	-	25
Langworthy Substation Rebuild (flood)	-	49	-
Memorial Blvd_Cable Relocation	730	824	532
Flood - Hope Substation	612	152	221
Flood - Pontiac	1,090	1,251	-
Flood - Warwick Mall Sub	24	70	-
Flood - Westerly	650	0	-
<b>Sub-Total Individual Projects</b>	<b>7,721</b>	<b>9,465</b>	<b>16,138</b>
<b>TOTAL (exc. I&amp;M)</b>	<b>17,348</b>	<b>23,410</b>	<b>30,770</b>

The FY 2017 budget for recurring projects is expected to reach levels of projected FY 2016 spend which is over-budget by forty-four percent (44%). Among these programs, the Company states that the metalclad switchgear and underground cable replacements are driving increasing costs in FY 2016 due to scope increases and accelerated schedules. Discussions with the Company on recurring projects focused on the continued need pursue programs that replace old or obsolete equipment while balancing budget pressures brought by upcoming major projects. PowerServices emphasized that Company must not

overlook small, yet critical efforts such as substation battery replacements, in order to reserve dollars for larger and more public projects. Ultimately, the Company requested an increase in the metalclad switchgear category to accommodate accelerated work and concurrence was reached on an overall budget of \$14,632,000 for discretionary spending on recurring projects.

Extensive discussions were held on the Asset Replacement budget earmarked for individual projects. This category is budgeted at \$16,138,000 as compared to a \$7,721,000 budget and \$9,465,000 forecasted spend in FY 2016. Expenses are dramatically climbing in this category fueled by the inclusion of a single major project – the South Street substation rebuild. The South Street project has been anticipated for some time and has been discussed in prior evaluations and specifically commented in the FY 2016 report as follows:

“...PowerServices is concerned that due to the uncertainties and complexity of the South Street project, scope changes are inevitable, there is exposure to significant budget increases, and the timeline is too aggressive. The Company is undertaking a major project in its most densely populated area and great care must be taken for diligent planning and methodical execution. A project of this magnitude with major expenditures commencing within 24 months should be better defined and budgeted. Overall, the Company’s plans lack detailed design, identification of risks and mitigation strategies, and adequate accuracy in cost estimates. The project should include this level of detail before the FY 2017 ISR to avoid unexpected and potentially massive budget overruns. This is but one example of a

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broader need to implement significantly better budget identification, controls and enforcement.”

South Street started as an \$18 million project when originally sanctioned and is now estimated at \$55 million. Significant scope changes have occurred due to the location of the proposed work in concert with the need to coordinate with private development projects in Providence. It comprises eighteen percent (18%) of the total ISR capital budget, or \$15.36 million dollars. Overall, the increased projections in Asset Replacement projects raise several concerns that have been discussed in previous ISR reports, and are again addressed in this FY 2017 evaluation, particularly with respect to South Street, including the Company’s need to:

- Shift focus from mature programs to significant capital projects
- Improve initial capital budget estimates
- Complete Long Range Plans prior to scheduling major projects
- Improve budget and scheduling management for major projects
- Minimize managing discretionary budgets to an overall target and improve individual project budget management.

The Company has demonstrated in the past two ISR Plans that it has failed to develop comprehensive and accurate capital project estimates. Additionally, it has failed to manage to its category budgets. These are disturbing trends which the Company has assured it will rectify. I will address these concerns, the company’s actions, and future

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recommendations by discussing aspects of comprehensive planning and project management as it relates to various proposed ISR projects.

a. *Project Justification and Long Range Planning*

The first step in the planning process is to ensure that a project is sufficiently justified. Emphasis on this matter began with PowerServices' FY 2015 report which recommended that:

“Going forward, asset replacements scheduled within the Asset Condition category should be evaluated against the results of a System Capacity Study and resulting Long Range Plan before inclusion in the ISR Plan. Lastly, beginning with the FY 2016 ISR Plan, individual assets scheduled for replacement under the Asset Condition category must also be evaluated against the Company's Long Range Plan, where applicable, to ensure that a cohesive system capacity strategy is achieved.”

The Public Utilities Commission Report and Order for the FY 2015 ISR concurred and found that the Company should provide more detail to support the purported need for the investment, particularly for multi-year projects or those classified as “major programs”.

In response, the Company is in the second year of performing area studies to be used to support projects in the ISR Plan, and has provided the following update in the FY 2017 ISR filing:

**National Grid's Study Area Current Priority and Statistics**

Rank	Study Area	Load (MVA)	% State Load	# of Feeders	# of Stations	Study Status
1	Providence	364	19%	95	17	50%
2	East Bay	157	8%	23	7	100%
3A	Blackstone Valley North	145	7%	20	5	20%
3B	North Central RI	254	13%	35	10	20%
4	Central RI East	197	10%	38	10	
5	South County East	184	10%	21	9	
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	
	<b>Total:</b>	<b>1,940</b>	<b>100%</b>	<b>392</b>	<b>103</b>	<b>22%</b>

\* Study Status Total = % State Load Weighted Total

It has been recognized that while studies are progressing, there are multi-year Asset Condition projects in the current Plan that require significant budgets and resources. It had been agreed, and continues to be acceptable, that these projects remain in the Plan. The Company maintains that future discretionary projects will not be proposed unless vetted and supported by a comprehensive area study and that new projects were not included in the FY 2017 Plan. This is consistent with PowerServices recommendations and expectations. The Company has furnished PowerServices with completed studies (East Bay to date) which will be used evaluate proposed area projects, if any, in future Plans.

*b. Capital Budget Estimates*

The effectiveness of the Company's capital budgeting process for significant and multi-year projects has been a dilemma for some time. Once the need for a project is identified and ideally supported with an area study, a scope and budget must be developed for inclusion in the Plan. The Company utilizes a multi-step internal

approval process to estimate<sup>3</sup> and refine budgets. A project is often scheduled in the Plan prior to receiving the most accurate scope and estimate possible. In turn, the Company is spending capital and commencing construction before comprehensive engineering and design is finalized. The inevitable results are scope expansion, budget increases, and unrealistic schedules.

The need to improve capital budget estimates is reflected in the change between the Company's first project sanction and current estimates. For major Asset Replacement projects, estimates have almost doubled from an initial amount of \$54 million to \$94 million. South Street alone increased from \$18 million to \$55 million. Multiple discussions have been held with the Company in prior years regarding grossly inaccurate budget estimates. The estimates then become benchmarks for annual and long-term capital investment which create unrealistic schedules and spending targets. The Company has consistently struggled to meet discretionary budgets and schedules which is exacerbated by the fact that the project is included in the ISR Plan and capital expenditures and construction begin well before it is a Project Grade estimate (+10%/- 10%).

In response to these continued concerns, the Company has verbally committed to improve internal processes aimed at achieving more accurate project scopes and budgets. Their FY 2017 ISR Plan filing<sup>4</sup> explains the strategy as follows:

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<sup>3</sup> National Grid defines three levels of estimate grade accuracy.- Conceptual = +50%/-25%, Planning = +25%/-25%, and Project = +10%/-10%. Each project transitions through these estimate grades as engineering and design is refined.

<sup>4</sup> Docket 4592 - National Grid's Proposed FY 2017 Electric ISR: Section 1, pages 4-5

“To improve adherence to annual project budgets and schedules, which would reduce the number of projects reported, the Company is focusing on three areas. First, the Company has implemented process improvements to improve the scope definition at project initiation by collecting more information from Operations and other local departments during this phase of the project lifecycle. This information may have otherwise been discovered late in the project lifecycle, resulting in budget variances due to changes to the project scope, estimate and schedule at that time. Second, the Company has consolidated large project estimating under a single department, which will provide consistent estimating practices when developing Conceptual, Planning, and Project Grade estimates. For previous ISR plans, multiple departments were responsible for developing estimates. By applying consistent practices, such as the application of payroll overheads (i.e. benefits, capital clearing accounts, etc.) to direct charges, the variances between the project estimate stages could decline. Third, the Company is endeavoring to increase the number of those projects that require construction in the upcoming year that have a Project Grade estimate at the time of the ISR filing. By improving the scope definition, estimates, and project maturity, the Company believes that the forecasted cash flows used for the development of the annual ISR budgets will result in fewer annual budget variances.”

PowerServices expects the Company’s proposal to vastly improve project estimates and schedules on the front end of the planning cycle which should enable better success in managing annual targets in the future. Improved estimating should reduce the level of annual ISR Plan reconciliation rate adjustments which have cast doubt on

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the effectiveness of the annual ISR Plan process. The Company's three-pronged approach is early in the implementation phase and may not have as meaningful impact on projects in construction as it will on future projects. This is, however, a positive step forward and the Company's activities and results will continue to be monitored.

c. Budget and Schedule Management

Lastly, an area which requires more attention and proactive measures relates to the Company's ongoing project management and ability to execute on time and on budget. Success is crucial since variances generally mean unforeseen costs and rate increases. There is no doubt that situations arise which require unanticipated resources, but the Company's ability to efficiently manage the Plan can reduce or even mitigate these events. The Company has developed a trend for discretionary spending in which collective projects are managed to a specific goal rather than each project being executed as presented in the initial proposed Plan. The inherent flexibility built into the process allows the Company to suspend certain projects in order to make up for over-budgets in other projects. The constant shift in project prioritization has raised questions in the past regarding expectations of the Company to execute individual projects deemed acceptable through the ISR Plan budget approval process, only to re-allocate dollars as the Company's focus changes throughout the year. If the Company does not execute the approved Plan, it may be questioned as to why there is a detailed evaluation in the first place. The Company must be held more accountable for following the approved ISR Plan projects and budgets.

PowerServices recognizes that project scopes and costs fluctuate and that the Company cannot be restricted to a narrow plan for discretionary work. However, when a significant project such as South Street comprises the majority of the budget, there is ample opportunity for the Company to deviate from the Plan if that single large project is under-budget. For example, a 20% underspend in the \$15.36 million South Street budget would result in a \$3 million discretionary variance which is more than any other budgeted category in Asset Replacement. In this example, the Company would historically re-phase projects such that the under-budget may be used to offset other projects that are over-budget in order to manage to a single discretionary target. The result is twofold; first, projects are shifted numerous times over the course of the fiscal year, and there is no accountability to a specific spend or timeline, and second, although the Company may underspend select individually approved project targets, they spend or exceed the entire discretionary budget anyway. This management method cannot continue and is unacceptable now that a single major project comprises the majority of the budget.

To improve future discretionary budget control, PowerServices requested that the Company manage the South Street budget independently of other discretionary projects. Specifically, the following conditions were provided to the Company during the budget adjustment process:

- National Grid will manage (underspend/overspend management) individual project costs within the FY 2017 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 South Street. The FY 2017 discretionary budget target will be \$37,163,427 (equivalent to the total discretionary budget of \$52,523,427 less the South Street budget of \$15,360,000).

- National Grid will manage the South Street FY 2017 ISR plan budget separate from the remaining discretionary projects, or any other projects within the FY 2017 ISR plan. Should National Grid underspend the South Street budget of \$15,360,000, any remaining balance shall not be redistributed or allocated to any other project in the ISR Plan. Should National Grid redistribute or allocate the remaining balance to another project, that balance will not be included in the reconciliation process for rate adjustment.

The Company agreed and has stated in the ISR filing<sup>5</sup> that:

“The South Street project presents unique challenges to managing the discretionary portfolio due to its size, cost and complexity. As part of the execution of the project, the forecasted \$15.3 million spend in FY 2017 may change as risks occur and/or cost savings are achieved. If South Street is managed with the overall dictionary portfolio, any changes may result in the need to advance or delay several projects, especially if the variance is significant. Instead, the Company will manage the South Street project as a distinct portfolio of spend

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<sup>5</sup> Docket 4592 - National Grid's Proposed FY 2017 Electric ISR: Section 1, page 5

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and not advance or delay other discretionary projects if over- or under-spend occurs on the South Street project.”

PowerServices finds the Company’s proposed budget management actions acceptable and will monitor activity as updated filings are presented. Should budget re-allocation occur between South Street and other discretionary projects, PowerServices will highlight the variances for potential exclusion from future recovery. In addition, the South Street project will be subject to more thorough scrutiny which begins with this ISR evaluation. Detailed project scope, internal project estimates, contractor bid information, the contractor management plan, construction schedules and contractor payment schedules have been requested of the Company to aid in oversight and better understanding of future variations. Updated information will be expected as the project commences and as the Company files quarterly ISR updates.

At the conclusion of the evaluation of Asset Replacement and upon the Company’s refinement of various project estimates, the budget was adjusted for a net reduction of \$3,964,000 bringing the total FY 2017 proposed budget to \$30,770,427.

2. 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<sup>6</sup> are performed on a five-year cycle and the proposed plan is designed to fund repair work

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<sup>6</sup> 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.

necessary to reach a ten-year repair cycle. The Company has inspected 92% percent of its overhead distribution system feeders and is on track to finish inspecting 100% of all Rhode Island feeders by the end of FY 2016, thus completing the five-year inspection cycle. FY 2017 will begin the second five-year cycle for the distribution system and continues the sub-transmission inspection program. The Company will also continue inspections of its manhole-based underground assets and mobile elevated voltage testing as part of the I&M Program.

Proposed capital spending for FY 2017 has been reduced by sixty-three (63%) to \$2.5 million, and the O&M budget has been reduced by sixty-one (61%). No adjustments were recommended.

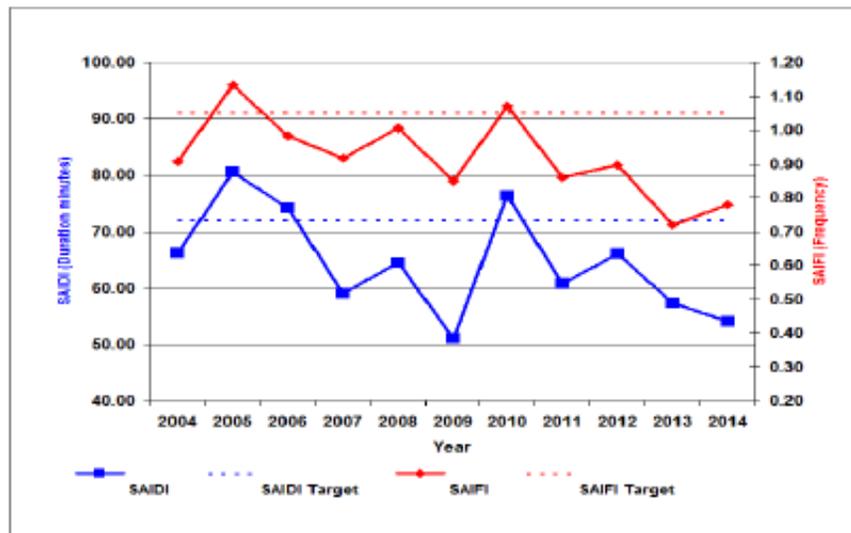
<b>Asset Condition Category</b>	<b>FY16 ISR Budget</b>	<b>FY16 ISR Forecast</b>	<b>FY17 ISR Budget</b>
Asset Replacement - I&M (NE)	6,705,000	6,200,000	2,510,000

The budget decrease, compelled by the Company’s desire to achieve a total ISR Plan capital budget target of \$90 million, is consistent with PowerServices’ observation that the I&M program warrants budget reductions. The program is mature, and successful implementation has influenced excellent reliability results. The Company is meeting or exceeding annual service reliability targets for most years. (Chart 4).<sup>7</sup>

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<sup>7</sup> Docket 4592 - National Grid’s Proposed FY 2017 Electric ISR: Section 2, page 3

**CHART 4: RI Reliability Performance Regulatory Criteria  
(Excluding Major Event Days)**

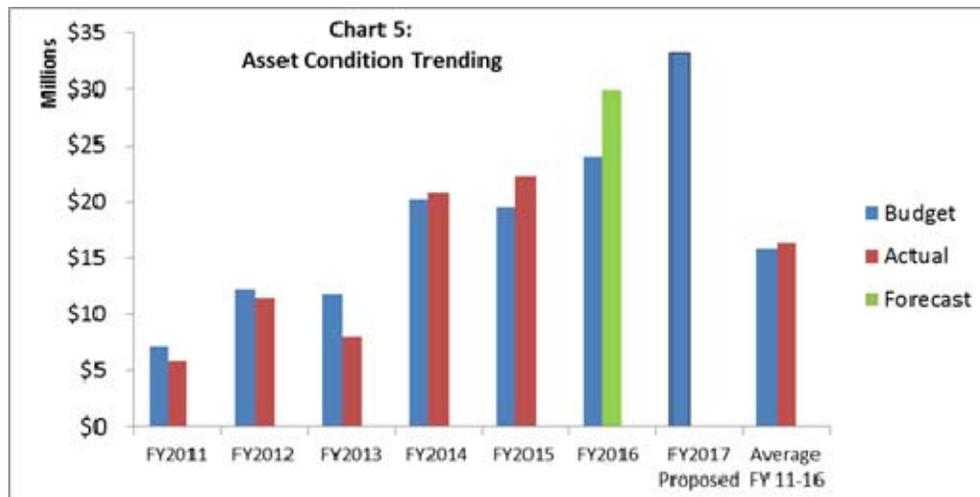


Additionally, inspection costs are expected to be lower now that the Company is starting its second pass of the system while maintaining a five-year cycle. Offsetting this progress is the potential delay in the construction cycle. At the current construction rate (approximately 20% complete after 5 years), the Company is on a twenty-five year construction cycle which exceeds the targeted ten-year cycle. However, PowerServices notes that I&M work may be shifting to a non-discretionary category which arbitrarily affects budgets and the construction cycle. As previously addressed in this report, there is increased spend in the identification and replacement of assets by Operations in the Ocean State Damage/Failure blanket for line and substations. In short, work that may normally be identified and scheduled in the I&M category may be actually performed and allocated under the Damage/Failure category.

PowerServices believes that both the I&M and Damage/Failure blanket categories should be trending down over time. To better monitor activity and expenses between both,

PowerServices has requested that the Company supplement future quarterly filings with more detail in the Damage and Failure subcategory, including identification of Level I I&M construction. The detailed reporting will aid in understanding the rationale for expenditures and whether projects are pursued due to imminent failure (damage/failure category) as opposed to preventative maintenance (I&M category). Future evaluation may prompt recommendations to re-allocate budgets between the categories, but will not prevent the Company from performing necessary work. In addition, tracking progress in both categories will provide a better understanding of the true construction cycle for system repair work.

In summary, concurrence was reached on budget reductions of \$3,964,000 for Asset Replacement and the I&M program remained unadjusted. This brings the total FY 2017 ISR proposed budget for Asset Condition to \$33,280,427, comprised of \$30,770,427 for Asset Replacement, \$2,510,000 for the I&M program. Upward pressure due to the South Street project began in FY 2016 and is expected to continue, pushing the proposed budget well above historical amounts. (Chart 5).



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 \$275,000 of capital expenditures prudent and necessary, while consistent with prior costs.

F. System Capacity and Performance Category

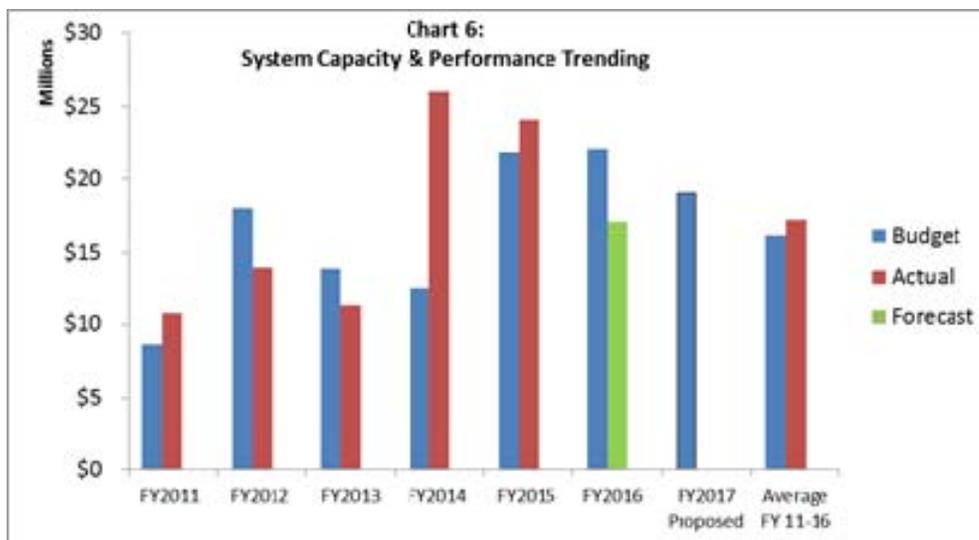
The System Capacity and Performance Category is comprised of both Load Relief and Reliability Projects. A significant portion of this discretionary budget is dedicated to substation capacity expansion projects. The Company initially proposed to expend \$20,663,000 in the System Capacity and Performance Category, or twenty-three percent (23%) of the total FY 2017 ISR Plan budget. Of this, \$15,374,000 or seventy-four percent (74%) is designated for capacity related projects. The overall budget is seven percent (7%) lower than the FY 2016 budget but is \$3.6 million (21%) above the Company’s FY 2016 actual forecast of \$17,072,000.

Proposed Budget	Initial FY2017 (9-22-15)	PowerServices Adjustments	Final FY2017 (12-9-15)
System Capacity and Performance	\$ 20,663,000	\$ (1,695,000)	\$ 18,968,000

SPENDING RATIONALE	Filed FY2016	Over/(Under) Budget	FY2016 Forecast
System Capacity and Performance	\$ 22,148,000	\$ (5,076,000)	\$ 17,072,000

Variance explanations for the Company’s FY 2016 forecast are a departure from previous years where the Company experienced consistent overspend rather than underspend. Review of prior actual expenses as compared to budget (Chart 6) shows that the company, on

average, is tracking very close to budget, although individual years may have broad variances. FY 2016 is unusually low and under-budget.



For FY 2016, the Company delayed several projects to meet an overall year-end discretionary portfolio of \$46.5 million. In essence, System Capacity and Performance projects were throttled back once the South Street project (in the Asset Condition category) incurred significant scope changes and costs. The flexibility to re-phase projects and the strategy of managing to an overall target is discussed at length in Section D.1. It is expected that, going forward, the Company will manage significant projects such as South Street, separately from the remaining discretionary budget.

Similar to the Asset Condition category, System Capacity and Performance is in a pivotal year. In prior ISR Plans, projects have been included well before receiving a Project Grade estimate and consistently re-phased, resulting in scope changes and budget variances. These factors contributed to lengthy discussions with the Company and additional ISR requirements instituted over FY 2015/2016 including, among other items, that future Asset Replacement

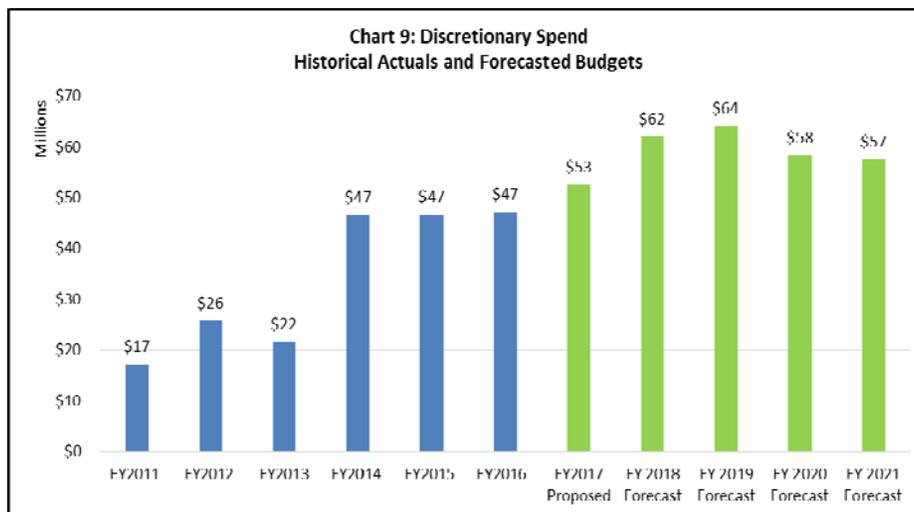
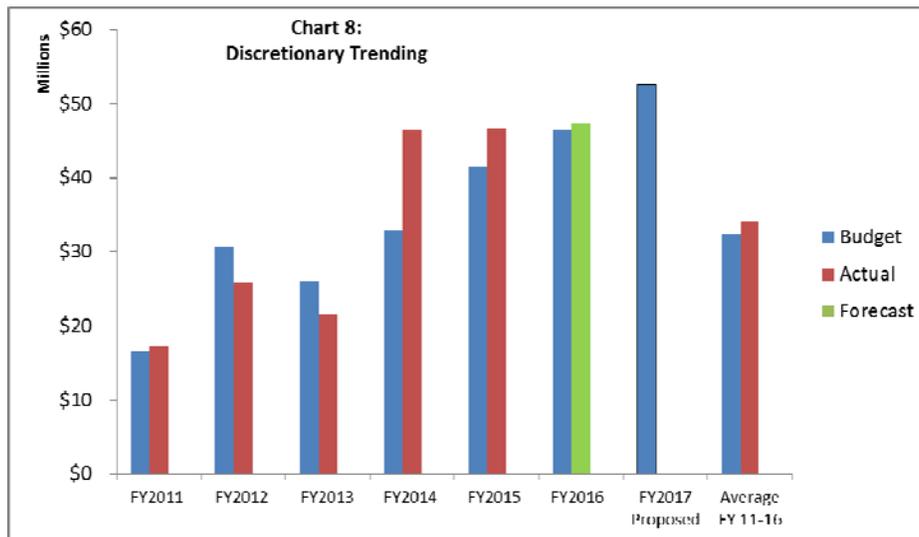
and System Capacity & Performance projects be justified under a comprehensive, system-wide Long Range Plan before inclusion in the ISR Plan. The Company's FY 2017 ISR Plan prioritizes six (6) existing Load Relief projects (Chart 7). Consistent with the requirements, the Company did not add new projects including those in the East Bay area which is the first and only system study completed to date. The rationale for pursuing each project has not changed and PowerServices concurs with the overall portfolio. Within this category, minor budget adjustments were made resulting in a proposed FY 2017 budget of \$13.8 million.

**Chart 7: Load Relief Projects**

<b>Projects</b>	<b>FY2017 ISR Budget (\$000)</b>
Aquidneck Island (includes former Jepson & Newport projects))	2,882
Chase Hill (Hopkinton) & Related	3,690
Kent County	1,940
New London Ave Substation #150	4,090
Quonset Sub	1,081
Kilvert St - DSub	146
<b>Total</b>	<b>13,829</b>

In summary, based on my evaluation, I recommend a \$1,695,000 downward adjustment to the System Capacity & Performance category, bringing the final FY 2017 proposed budget to \$18,968,000. I continue to support the need for a comprehensive, system-wide Long Range Plan before inclusion of new projects in the ISR Plan, and that the evaluation should be provided as part of ISR Plan. Lastly, consistent with the Company's commitment to improve adherence to annual projects budgets and schedules, the Company will manage the South Street project as a distinct portfolio of spend and not advance or delay other discretionary projects if overspend or underspend occurs on the South Street project.

This brings the total discretionary categories of Asset Condition, Non-Infrastructure, and System Capacity & Performance to \$52,523,427, which is 63% of the total Capital Investment of the ISR Plan budget. A trending analysis of discretionary spending (Chart 8) indicates that the Company is, on average, slightly exceeding budget. More importantly, tracking historical actuals and forecasted budgets (Chart 9) shows significant step increases in expenditures over time and that the Company anticipates future budgets that hover near \$60 million per year. The forecast reinforces the Company’s need for improved project scopes, budget estimates, and plans to actively manage the discretionary portfolio.



**III. VEGETATION MANAGEMENT**

The Company’s initial FY 2017 ISR Plan proposed expenditures of \$9,680,000 for the Vegetation Management Program, which includes the Enhanced Hazard Tree Mitigation (EHTM) program, is nine percent (9%) higher than the FY 2016 budget. The forecasted FY 2016 spend is \$8,029,095. The major spending component is Cycle Pruning with a proposed budget of \$5,400,000. The Company also included \$250,000 in the EHTM category for Emerald Ash Borer management activities, which the Company anticipates becoming a threat throughout Rhode Island. Through a series of discussions, data requests, and further budget refinements by the Company, concurrence was reached to reduce the Vegetation Management Program budget by \$825,000 bringing the FY 2017 final proposed budget level to \$8,855,000. (Chart 10).

<b>Chart 10: VEGETATION MANAGEMENT Proposed Budget</b>	<b>Initial FY2017 (9-22-15)</b>	<b>PowerServices Adjustment</b>	<b>Final FY2017 (12-9-15)</b>
Cycle Pruning	5,400,000	(350,000)	5,050,000
Hazard Tree	1,250,000	(300,000)	950,000
Sub-T	780,000		780,000
Police/Flagman Detail	850,000		850,000
All Other Activities	1,400,000	(175,000)	1,225,000
<b>Program Total</b>	<b>9,680,000</b>	<b>(825,000)</b>	<b>8,855,000</b>

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 level and frequency of cycle pruning work, which is consistent with industry practices. The Company reports<sup>8</sup> that, on average, a 30% improvement in customer interruptions (CI) per circuit occurs in the first year after pruning. The Company has adhered to a four-year cycle for overhead distribution circuits

<sup>8</sup> Docket 4592 - National Grid’s Proposed FY 2017 Electric ISR: Section 3, page 3

with the first cycle being completed in FY 2014. It is anticipated that cost efficiencies should be incurred after the initial pass, since trimming will be more routine in nature as opposed to managing decades of vegetation growth. 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<sup>9</sup> that three years of tree-related interruption data for Rhode Island indicates that fallen trees account for 50% of tree-related customer interruptions. Reliability data (Chart 11) show that trees continue to account for a significant number of interruptions.

**CHART 11**  
**Rhode Island Customer Interrupted by Cause**  
**Major Event Days Excluded**  
**By Fiscal Year (2008-2015)**

Cause	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Adverse Environment	1,673	5,651	4,018	5,992	3,674	6,584	811	6,786
Animal	15,103	16,303	14,751	15,335	15,008	9,864	10,098	21,232
Deteriorated Equipment	71,336	69,296	88,655	78,009	84,052	43,196	59,239	68,992
Human Element/Company	20,633	24,393	8,846	27,305	17,722	8,500	9,304	11,507
Human Element/Other	28,547	35,531	44,248	51,837	46,171	45,152	48,008	25,659
Intentional	50,735	36,569	59,581	33,987	41,879	42,989	44,451	55,268
Lightning	44,176	19,577	27,874	36,883	11,098	9,362	23,882	5,234
Substation	55,282	53,391	12,120	82,926	51,866	38,492	23,243	26,527
Sub-Transmission	24,298	31,628	22,243	39,770	29,805	44,084	53,550	26,191
Transmission	20,176	6,000	7,093	11,370	2,973	19,099	4,568	18,284
Tree	104,023	79,977	83,311	88,714	88,474	90,726	56,964	63,009
Unknown	29,583	26,146	15,807	29,629	29,163	34,143	18,501	23,529
<b>Grand Total</b>	<b>465,565</b>	<b>404,462</b>	<b>388,547</b>	<b>501,757</b>	<b>421,885</b>	<b>392,191</b>	<b>352,619</b>	<b>352,218</b>

<sup>9</sup> Docket 4592 - National Grid's Proposed FY 2017 Electric ISR: Section 3: page 4

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The EHTM program accounts for over ten percent (10%) of the proposed Vegetation Management budget, and has been a source of annual discussions to better understand the cost/benefit of the program. The Company indicated, in response to the Division's data request, that since 2008 hazard trees have accounted for 39% of tree related interruptions and that annual removals have ranged from 84 to 1,307 trees.

Further discussions with the Company revealed that the Company does not track outages caused by hazard trees. Fallen trees causing customer interruptions are not recorded as hazard trees, but rather the Company expects that the majority of tree failures would be due to hazard trees. PowerServices' concern is not that EHTM is a worthwhile program and consistent with industry practices, but that records cannot directly attribute outages to hazard trees and that incremental benefits to reliability are somewhat subjective. The number of trees removed annually and the cost per tree removed (Table 4) varies widely from year to year, and it is difficult to determine the level of outages prevented by such activities. The Company has indicated they believe there is significant value gained from the Enhanced Hazard Tree Maintenance program, although they keep no records and cannot quantify the effectiveness or cost benefit with any specificity. FirstEnergy (Jersey Central Power & Light Company) reports its annual performance to the New Jersey Board of Public Utilities, which includes four (4) categories of tree related outages, including trees off the right-of-way. They also keep these records based on the area of the system. Customer hour percentage breakdown by cause indicates that trees off the right-of-way account for 7.25% of all outage hours. Trees off the right-of-way accounted for 12% and 30% of all tree related outages in 2013 and 2014, respectively. This is in comparison to the Company's estimation that trees off its right of way account for 39% of its tree related outages. Since National Grid does not keep actual statistics by tree related outage cause,

we believe its cost benefit analysis associated with the EHTM program is overly optimistic. We recommend the Company, in future ISR Plans, rely more heavily on granular statistics supported by its own data or data of other northeast utilities that account for actual hazard tree outages in order to establish a more cost justifiable EHTM program budget.

**Table 4: Hazard Tree Removal by Year**

Fiscal Year	Circuits	Removals	ACTUAL \$	\$/CKT	\$/Tree Removal
2008	7	1,307	\$ 721,000	\$ 103,000	\$ 552
2009	9	920	\$ 757,000	\$ 84,111	\$ 823
2010	13	1,030	\$ 709,000	\$ 54,538	\$ 688
2011	1	84	\$ 283,000	\$ 283,000	\$ 3,369
2012	6	1,040	\$ 806,000	\$ 134,333	\$ 775
2013	14	942	\$ 1,198,336	\$ 85,595	\$ 1,272
2014	7	701	\$ 699,867	\$ 99,981	\$ 998
2015	9	1,103	\$ 800,769	\$ 88,974	\$ 726

I believe that hazard tree identification and removal, particularly on the worst performing feeders, is critical but that increases to this budget and expansion of the program would not provide meaningful improvements to reliability. The Company is effectively controlling overall tree related outages such that annual reliability metrics are met, and is doing so with EHTM expenditures that have been, on average, fifteen percent (15%) of the cycle trimming budget. I believe that the Company's proposed budget, which is twenty-three (23%) of the cycle pruning budget, is overstated. An EHTM budget of \$950,000 should be adequate for EHTM activities, including additional work proposed by the Company to proactively inventory trees that may be potentially impacted by the Emerald Ash Borer. My recommendation is 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. Upon full assessment, the program may be funded in future ISR Plans as determined appropriate. For these

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reasons, PowerServices recommended, and the Company agreed, to reduce the proposed FY 2017 EHTM budget by \$300,000 resulting in a proposed budget of \$950,000.

The remaining components of Vegetation Management include sub transmission work, police detail, and a general category for all other (core) activities. PowerServices requested further detail on core activities regarding the type and frequency of work. The Company produced records indicating that many calls are customer driven and not reimbursable. Core activities work also includes emergency work, spot trimming, and managing vine-related issues. The Core Activities proposed budget is \$1.4 million as compared to the FY 2016 forecast of \$1.1 million. Ultimately, the Company reduced the budget proposal by \$175,000 and agreement was reached on a final proposed amount of \$1,225,000.

Lastly, I will address the Company's obligation to request and recover Verizon's reimbursement for both routine and storm related vegetation management expenses. Over several years, I have noted that the Company had not been pursuing their contractual rights and obligation under the IOP J of a pole Joint Ownership Agreement ("JOA") between the Company and Verizon. The IOP J establishes a cost sharing mechanism for preventative maintenance tree trimming and storm work. [REDACTED]

[REDACTED] I expressed concern that the Company did not dispute Verizon's ability to terminate the IOP J, has not negotiated a new agreement, and has not aggressively pursued prior years' expenses.

[REDACTED]

[REDACTED]

In summary, I find the \$8,855,000 FY 2017 proposed budget level and a four year clearing cycle based on the Company's enhanced Vegetation Management Program to be appropriate, considering the anticipated level of benefits. I recommend that the Company's

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expenses for ash tree removal and to develop an inventory to accurately forecast the spread of the Emerald Ash Borer throughout the state be absorbed within the EHTM budget. Future budget requirements related to the Emerald Ash Borer will be considered based on the inventory results and the Company's preparation of a strategic management plan. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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**IV. SUMMARY AND RECOMMENDATIONS**

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The collaborative process between the Company and the Division resulted in a FY 2017 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 the efficient benefit/cost considerations. Appendix-3, 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 September 22, 2015, and the resulting December 9, 2015 filing of the FY 2017 ISR Plan Proposal. The consensus ISR Plan is a three percent (3%) reduction of \$900,000 in the non-discretionary capital spending budget and a ten percent (10%) reduction of \$5,659,000 in the discretionary capital spending budget, for an overall reduction of \$6,559,000 or seven percent (7%).

For FY 2017, 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 supported continued investment in proposed categories but did observe that some work performed under the non-discretionary category may actually be discretionary. Additional detailed support, to be provided by the Company in its quarterly filings, will aid in understanding the rationale and proper cost allocation for these projects.

The Company continues to pursue a portfolio of capital investments to replace aging and obsolete infrastructure. Focus is shifting from small, individual projects to multi-year major projects. The Company cannot continue to effectively manage a \$90 million ISR Plan without

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comprehensive project scopes and accurate cost estimates. Efforts to improve scopes, budgets, and ongoing project management must be prioritized. FY 2017 and FY 2018 construction activities will be dominated by a single major project, the South Street substation rebuild. The Company will be expected to manage the South Street budget independent of other discretionary projects. This emerging project will be monitored quarterly and the expectation is that future major projects will also require additional levels of reporting and documentation.

The longer term challenge will be how the Company globally prioritizes and schedules projects arising from independent area studies, which are only 22% complete, while balancing competing interests of safety, reliability, 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 Company must be diligent in preparing and adhering to planning criteria that supports orderly development of the system. Emphasis on long-term planning, combined with enhanced budgeting and project management, are expected to bring many improvements to the ISR Plan process.

I support the FY 2017 Capital Budget as proposed at \$83,440,977. I also support the FY 2017 proposed VM Program at \$8,885,000. Lastly, I support the I&M Program Operations and Maintenance Expenses at \$1,291,750, which includes a System Capacity Study. Furthermore, I am a proponent for an annual adjustment process for the categories of Customer Request/Public Requirements and Damage/Failure.

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Recommendations

1. 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 a report with updates on modeling activities in addition to the proposed Long Range Plan (completed portions) at least 120 days prior to filing its FY 2018 ISR Plan Proposal, but in any event no later than August 31, 2016. This should be continued with each subsequent ISR Plan process. There is some support for considering the planning process review as a separate activity from the ISR Plan, allowing increased efficiency in future ISR Plan process and Division review.
2. National Grid shall manage the South Street FY 2017 ISR Plan budget separate from other discretionary projects, such that any budget variances (underspend) will not be utilized in other areas of the Plan. The Company shall provide quarterly budget and project management reports.
3. National Grid will manage (underspend/overspend management) individual project costs within the FY 2017 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 South Street. The FY 2017 discretionary budget target will be \$37,163,427 (equivalent to the total discretionary budget of \$52,523,427 less the South Street budget of \$15,360,000).

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4. National Grid shall 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.
  
  5. 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 2018 ISR Plan Proposal filing, but in any event no later than August 31, 2016.
  
  6. 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 2018 ISR Plan Proposal filing, but in any event no later than August 31, 2016.
  
  7. 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 2018 ISR Plan Proposal filing, but in any event no later than August 31, 2016.
  
  8. 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 2018 ISR Plan Proposal, but in any event no later than August 31, 2016.

9. 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 2018 ISR Plan Proposal, but in any event no later than August 31, 2016.

[REDACTED]

# APPENDIX 1

Rhode Island Electric ISR  
 FY17 Plan – Meeting with Division and Greg Booth  
 August 7, 2015  
 1:00 p.m. to 4:00 p.m.

**AGENDA**

Topic	Presenter	Handouts	Time
Opening Remarks	Jim Patterson/All		1:00 – 1:15
Vegetation Management – <ul style="list-style-type: none"> <li>- Cost Benefit Report</li> <li>- FY17 Program</li> <li>- Traffic Protection</li> </ul>	Ryan Moe	A) Veg Mgmt Cost Benefit B) Attachment 1 (EHTM Reliability) C) Attachment 2 (Cycle Pruning Reliability)	1:15 – 1:45
Electric Infrastructure <ul style="list-style-type: none"> <li>- Long Range Plan</li> <li>- Substation Capacity Plans</li> <li>- Metalclad Replacement Program</li> </ul>	Ryan Constable	D) Prefile planning information: Long Range Plan, Asset Condition, System Capacity and Performance E) Detail Categories FY16-20 Working Draft Plan (for Asset Condition and System Capacity and Performance Categories) F) Metal Clad Replacement	1:45 – 2:45
I&M Cost Benefit Report	Emilio Agustin	G) I&M Cost Benefit	2:45 – 3:15
FY17-FY21 Proposed Capital Budget <ul style="list-style-type: none"> <li>- Overview</li> <li>- Monthly PCM Process</li> </ul>	Glen DiConza/Jim Patterson	H) Summary FY17-21 Working Draft Plan	3:15 – 3:55
Wrap Up & Next Steps	Jim Patterson		3:55 – 4:00

## APPENDIX 2

## Historical Budgets versus Actual

Spending Rationale	FY 2006	FY 2006	FY 2007	FY 2007	FY 2008	FY 2008
	Budget	Actual	Budget	Actual	Budget	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
<b>Total Discretionary</b>	<b>23,552,000</b>	<b>31,149,849</b>	<b>22,452,500</b>	<b>28,454,320</b>	<b>30,290,000</b>	<b>31,529,769</b>
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
<b>Grand Total</b>	<b>43,944,500</b>	<b>45,762,410</b>	<b>45,045,000</b>	<b>51,383,896</b>	<b>52,819,000</b>	<b>58,032,738</b>
Vegetation Management	-	-	-	-	-	6,630,000
Inspection & Maintenance Program	-	-	-	-	-	-

Spending Rationale	FY 2009	FY 2009	FY 2010	FY 2010	FY 2011	FY 2011
	Budget	Actual	Budget	Actual	Budget	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
<b>Total Discretionary</b>	<b>30,618,668</b>	<b>29,517,198</b>	<b>31,645,000</b>	<b>28,343,018</b>	<b>30,379,000</b>	<b>27,825,441</b>
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
<b>Grand Total</b>	<b>57,659,000</b>	<b>55,339,166</b>	<b>68,500,000</b>	<b>58,272,473</b>	<b>46,900,000</b>	<b>45,120,558</b>
Vegetation Management	-	7,857,000	-	6,882,000	-	4,829,000
Inspection & Maintenance Program	-	-	-	-	-	-

Spending Rationale	FY 2012	FY 2012	FY 2013	FY 2013	FY 2014	FY 2014
	Budget	Actual	Budget	Actual	Budget	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
<b>Total Discretionary</b>	<b>31,341,500</b>	<b>26,068,013</b>	<b>30,428,000</b>	<b>27,925,675</b>	<b>26,559,000</b>	<b>31,511,034</b>
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
<b>Grand Total</b>	<b>61,900,000</b>	<b>51,809,897</b>	<b>56,540,000</b>	<b>49,514,782</b>	<b>59,600,000</b>	<b>78,041,964</b>
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

Spending Rationale	FY 2015	FY 2015	FY 2016	FY 2016	FY 2017
	Budget	Actual	Budget	Forecast	Proposed
Customer Request/Public Requirements	14,537,000	17,759,797	15,647,000	16,487,000	19,450,550
Damage/Failure	9,816,000	3,044,445	11,177,000	17,932,000	11,467,000
<b>Total Discretionary</b>	<b>24,353,000</b>	<b>20,804,242</b>	<b>26,824,000</b>	<b>34,419,000</b>	<b>30,917,550</b>
Asset Condition	19,511,000	25,140,871	24,053,000	29,851,000	33,280,427
Non-Infrastructure	277,000	1,216,345	275,000	285,000	275,000
System Capacity & Performance	21,759,000	25,889,850	22,148,000	17,072,000	18,968,000
<b>Total Non-Discretionary</b>	<b>41,547,000</b>	<b>52,247,066</b>	<b>46,476,000</b>	<b>47,208,000</b>	<b>52,523,427</b>
<b>Grand Total</b>	<b>65,900,000</b>	<b>73,051,308</b>	<b>73,300,000</b>	<b>81,627,000</b>	<b>83,440,977</b>
Vegetation Management	7,726,000	8,029,095	8,884,000	8,029,095	8,855,000
Inspection & Maintenance Program	2,995,000	2,022,743	3,333,000	2,022,743	1,611,750

**APPENDIX 3**

FY2017 ISR Plan PowerServices Adjustments Capital Outlays by Key Driver Category and Budget Classification					
SPENDING RATIONALE	BUDGET CLASS	FY 2017			
		NG Initial Proposed Budget (9-22-15)	Net Adjustments (12-3-15)	Notes	PowerServices Proposed Budget (12-3-15)
Statutory/ Regulatory	3rd Party Attachments	155,000			155,000
	Distributed Generation	10,000			10,000
	Land and Land Rights - Dist	187,000			187,000
	Meters – Dist	2,170,000			2,170,000
	New Business - Commercial	5,577,000			5,577,000
	New Business - Residential	3,728,000			3,728,000
	Outdoor Lighting - Capital	541,000			541,000
	Block Island	519,050			519,050
	Public Requirements	3,813,500			3,813,500
	Transformers & Related Equipment	2,750,000			2,750,000
<b>Statutory/Regulatory Total</b>		<b>19,450,550</b>			<b>19,450,550</b>
Damage/ Failure	Damage/ Failure	9,767,000	(900,000)	(1)	8,867,000
	Major Storms – Dist	2,600,000			2,600,000
<b>Damage/Failure Total</b>		<b>12,367,000</b>	<b>(900,000)</b>		<b>11,467,000</b>
<b>Subtotal Non-Discretionary</b>		<b>31,817,550</b>	<b>(900,000)</b>		<b>30,917,550</b>
Asset Condition	Asset Replacement				
	URD Cable Strategy	2,500,400			2,500,400
	UG Cable Replacement	2,499,800			2,499,800
	Metalclad Switchgear	1,442,250	843,000		2,285,250
	Substation Transformer Replacement	955,820			955,820
	Flood Mitigation	221,000			221,000
	Southeast	25,000			25,000
	South Street	20,096,000	(4,736,000)	(3)	15,360,000
	Memorial Blvd_Cable Relocation	532,000			532,000
	Others	6,462,157	(71,000)		6,391,157
	Asset Replacement Total	34,734,427	(3,964,000)		30,770,427
Asset Replacement - I&M (NE)	2,510,000			2,510,000	
Safety	-			-	
<b>Asset Condition Total</b>		<b>37,244,427</b>	<b>(3,964,000)</b>		<b>33,280,427</b>
Non-Infrastructure	General Equipment	100,000			100,000
	Telecommunications Capital - Dist	175,000			175,000
<b>Non-Infrastructure Total</b>		<b>275,000</b>			<b>275,000</b>
System Capacity and Performance	Load Relief	15,374,000	(1,695,000)		13,679,000
	Reliability	5,289,000			5,289,000
<b>System Capacity and Performance Total</b>		<b>20,663,000</b>	<b>(1,695,000)</b>		<b>18,968,000</b>
<b>Subtotal Discretionary</b>		<b>58,182,427</b>	<b>(5,659,000)</b>	(2)	<b>52,523,427</b>
<b>Total Electric Distribution</b>		<b>89,999,977</b>	<b>(6,559,000)</b>		<b>83,440,977</b>
Vegetation Management Program	Cycle Trimming	5,400,000	(350,000)		5,050,000
	Hazard Tree	1,250,000	(300,000)		950,000
	Sub-T	780,000			780,000
	Police/Flagman Detail	850,000			850,000
	All Other Activities	1,400,000	(175,000)		1,225,000
<b>Vegetation Management Program Total</b>		<b>9,680,000</b>	<b>(825,000)</b>		<b>8,855,000</b>
Inspection and Maintenance Program	Operation and Maintenance Expenses:	-			-
	Opex related to Capex	450,000			450,000
	Repair - Related Costs	-			-
	Inspections and Repair- Related Costs	816,750			816,750
	Removal Costs	320,000			320,000
	System Planning & Protection Coordination Study	25,000			25,000
<b>Inspection and Maintenance Program Total</b>		<b>1,611,750</b>			<b>1,611,750</b>
<b>Grand Total ISR- All Programs</b>		<b>101,291,727</b>	<b>(7,384,000)</b>		<b>93,907,727</b>

**NOTES:**

**CONDITIONS OF ACCEPTANCE**

- (1) National Grid will provide quarterly reporting on damage/failure expenditures to include the details (type, cost, etc) of completed projects by operating region. National Grid will separately identify Level I projects repaired as a result of the I&M program. The report will commence with the FY2016 third quarterly report and be provided in an executable Excel format.
- (2) National Grid will manage (underspend/overspend management) individual project costs within the FY2017 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 South Street. The FY2017 Discretionary Budget Target will be \$37,163,427 (equivalent to the total discretionary budget of \$52,523,427 less the South Street budget of \$15,360,000).
- (3) National Grid will manage the South Street FY2017 ISR plan budget separate from the remaining discretionary projects, or any other projects within the FY2017 ISR plan. Should National Grid underspend the South Street budget of \$15,360,000, any remaining balance shall not be redistributed or allocated to any other project in the ISR plan. Should National Grid redistribute or allocate the remaining balance to another project that balance will not be included in the reconciliation process for rate adjustment.