

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

**The Narragansett Electric Company d/b/a National Grid's Proposed
FY 2013 Electric Infrastructure, Safety, and Reliability Plan
Docket No. 4307**

MEMORANDUM 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**

March 8, 2012



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INTRODUCTION

PowerServices was engaged by the Rhode Island Division of Public Utilities and Carriers (“Division”) to assist in the evaluation of the National Grid Electric Infrastructure, Safety, and Reliability Plan FY 2013 Proposal (the “ISR Plan” or the “Plan”) dated December 29, 2011. The evaluation followed the same process of analysis completed for the FY 2012 ISR Plan. This memorandum will include an explanation of the process for the initial ISR Plan evaluations and collaborative efforts resulting in a reduction of FY 2013 capital spending on infrastructure projects, operation and maintenance (“O&M”) expenses for Vegetation Management (“VM”), and O & M expenses for an Inspection and Maintenance (“I&M”) program from the Company’s initial ISR Plan submitted to the Division in October 21, 2011. 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 2013 to be included in what is now the Company’s filing of an Electric ISR Plan in Docket No. 4307.

The Company provided its initial proposed FY 2013 plan to the Division at the end of October 2011. This initial ISR Plan followed very closely the format and principals agreed to in the FY2012 ISR Plan, as approved. The Company kept most of the budget amounts close to the previous plan dollars and historical costs while generally meeting the guidelines used to reach agreement in costs during the last evaluation process. An in depth analysis of each component of

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the plan was undertaken. A series of data requests were served on the Company and the Company provided responses. These requests and responses will be made a part of the record through a filing of same by National Grid. On December 21, 2011, I provided an assessment to the Division and, subsequently, the Division delivered this assessment to the Company on December 21, 2011. A telephone conference with the Company and Division in attendance was held in which the ISR Plan and each element of the ISR Plan were discussed in detail. The Company addressed our questions and agreed to provide further information. Additionally, the Company elaborated on how certain programs, such as the I&M Program, would be transitioning in future years. A series of telephone conferences were held with various individuals in the Company to discuss our assessment and gain clarifications in certain areas.

An iterative process began with detailed discussions of each ISR Plan spending Rationale Category, including Capital Expenditures, the VM Plan, and the I&M Plan. The Company included each of its area experts in the discussions as we worked towards a final plan for FY 2013 which would have the support of the Division. The ISR Plan as adjusted during the evaluation process is reflected in the Company's December 29, 2011 filing with the Rhode Island Public Utilities Commission.

CAPITAL INVESTMENT PLAN

I have evaluated the \$56,540,000 FY 2013 Capital Spending Plan proposed by the Company, along with its supporting testimony and exhibits. I first reviewed the initial proposed ISR Plan submitted to the Division dated October 21, 2011 in the amount of \$58.0 million. Over a period of approximately two (2) months, 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. Below is

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a comparison of the Company's initial filed request in October 2011 and the Chart 4 Proposed FY 2013 as filed in Docket 4307. The \$56.5 million is the consensus level reached through the evaluation process and our adjustments to the initial request.

Chart 4: Proposed FY 2013 Capital Outlays by Key Driver Category

SPENDING RATIONALE	INITIAL FY2013 PROPOSED BUDGET (10-21-11)	POWERSERVICES ADJUSTMENTS	FILED FY2013 PROPOSED BUDGET (12-29-11)
Statutory/Regulatory	\$ 20,006,000	\$ -	\$ 20,006,000
Damage/Failure	\$ 10,422,000	\$ -	\$ 10,422,000
<i>Subtotal</i>	\$ 30,428,000	\$ -	\$ 30,428,000
Asset Condition Total	\$ 13,113,000	\$ (1,250,000)	\$ 11,863,000
Non-Infrastructure Total	\$ 336,000	\$ -	\$ 336,000
System Capacity and Performance Total	\$ 14,123,000	\$ (210,000)	\$ 13,913,000
<i>Subtotal</i>	\$ 27,572,000	\$ (1,460,000)	\$ 26,112,000
Grand Total	\$ 58,000,000	\$ (1,460,000)	\$ 56,540,000

The Company projects the need for \$20.006 million in Statutory / Regulatory spending and \$10.422 million in Damage / Failure spending. This is approximately fifty-four percent (54%) of the ISR Plan Capital requirements. These budgeted levels are reasonably supported by historical spending levels and reflect the Shun Pike substation, which is a substation required for a direct retail customer service. None of the projects in these categories are precisely defined because specific customer requests have not been made and damage or failure is yet to occur other than the Shun Pike substation. For that reason, historical spending serves as the primary method to develop a budget. The economic conditions are a factor considered in adjusting historical costs. There are both upward and downward trends in new construction costs combined with the effects of inflation on construction cost. The housing and commercial construction industry remains depressed while the cost of raw materials and construction cost have seen dramatic escalation. My analysis supports the Company's projections and they are consistent with last FY 2012 requirements as evaluated at that time with Statutory/Regulatory being some \$1.6 million lower, even with the Shun Pike substation addition this FY 2013.

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Since the budgets for these categories are not project specific, but rather based on the Company's best estimate using historical cost trends combined with most recent trend data, a mechanism for reconciliation of the actual expenditures to the budget projections was agreed upon in the last FY filing and will continue. This mechanism will reconcile the annual differences between the projected budget and the actual expenditures for the non-discretionary capital spending. The three categories, which are discretionary in the sense they are based on engineering, safety, reliability and economic analyses rather than being mandatory as are the previous two categories discussed, account for the remaining forty-six percent (46%) of the proposed capital budget. These categories are Asset Condition, Non-Infrastructure, and System Capacity and Performance. The Flood Damage Avoidance Engineering Studies, which was a separate category in FY 2012 budget, have been included in the Asset Condition category in FY 2013 since that will now be an ongoing rehabilitation process. I specifically requested, received, and reviewed the initial flood mitigation study. I will discuss each category separately, which account for \$26.112 million.

Asset Condition

The predominant programs that resulted from this reliability assessment and annual reporting process begun in 2001 included a Feeder Hardening Program, a Feeder Health Program, and associated Operation & Maintenance reliability enhancements. These programs were successful and have now matured, resulting in the need for a transition to a continually sustainable program. The Company is continuing a program overlap which maintained the Feeder Hardening and Reliability O&M programs and the new I&M Program added in FY 2012, which is intended to be a portion of the future sustainable infrastructure asset management program. I identified several duplications in capital

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costs during the analysis of the Company's proposal. After some discussions with Company representatives, it was mutually agreed to reduce the capital programs in a portion of the Feeder Hardening and I&M Programs while restoring some of the cost reduction in the operations area. Also, the proposed \$1,205,000 for the flood mitigation engineering study has been added to this category for FY 2013. Our analysis and adjustments reduced the Asset Condition category by \$1,250,000, from \$13,113,000 to \$11,863,000.

Non-Infrastructure

This category is for telecommunications and other capital expenditures needed for operation, which are neither related to condition nor system capacity. I consider this \$336,000 of capital expenditures prudent and necessary while consistent with prior costs adjusted for construction cost escalation.

System Capacity and Performance

The \$13,913,000 in the System Capacity and Performance category represents projects which include increased substation capacity, distribution conductor replacement, and the addition of capacitors and sectionalizing equipment in order to meet the capacity and voltage delivery requirements of the system predicated on existing and future projected load additions. Equipment and power line thermal stress, outage contingency switching and maintenance of adequate voltage delivery were the primary drivers identified with the proposed capital projects. I found the projects to be justified and based on sound and prudent engineering and economics.

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Flood Damage Avoidance

Rhode Island experienced significant flooding in March 2010, which caused widespread customer outages. Nine substations were affected that continue to be vulnerable to future adverse impact from flooding. The Company proposed to expend \$1,200,000 in engineering during FY 2012 to determine the most cost effective way to mitigate future widespread outages from flooding. The Company has continued to include engineering analysis costs of \$1,205,000 for FY 2013 which, however, is not under a separate category but rather included in the Asset Condition category. Both data requests ask for clarification of this cost inclusion and discussions were held, and the Company provided its current Flood Mitigation Study which was reviewed. What the Company characterizes as a study is actually only an internal review in presentation format without any narrative, executive summary, or defined process. Also, the Company had a detailed survey of the substations completed. Although I support the expenditure of up to \$1,205,000 for engineering to complete the study analysis and planning for mitigation, the final plan and capital expenditures should receive a separate and comprehensive evaluation before all capital requirements are agreed upon. I recommend the Company file a "Final Flood Mitigation Plan" with the Division at least 6 months prior to the filing of the FY 2014 ISR Plan. This study should include a detailed mitigation process and plan with cost for all options identified and the cost benefit of each option. It should include the Company's recommended capital plan that is proposed for inclusion in each of the coming ISR Plan years by year. The Division and the Commission should carefully evaluate the mitigation plans resulting from this study and determine the risk mitigation value before any commitment is made to expend significant capital in future years beginning with FY 2014. It must be recognized that the flood was a very unusual

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occurrence (once in 100 to 500 years) and, therefore, capital cost for mitigation must be placed in the context of future occurrence likelihood and risk tolerance.

Overall

The previous Chart 4 under the Introduction compares the Company's October 21, 2011 proposed capital expenditure levels to those the Division and the Company ultimately agreed upon as reflected in the Company's ISR Plan filed December 29, 2011. The consensus ISR Plan is nearly six percent (6%) reduction in the discretionary capital spending budget from the October 21, 2011 proposed level. The overall capital spending reduction was nearly three percent (3%) or \$1,460,000. The Company very closely tracked the FY 2012 approved ISR Plan in its filing for FY 2013. The approved FY 2012 ISR Plan exceeded \$58 million in capital spending, while the FY 2013 as proposed is \$56.5 million.

The analysis indicated the Company made the reductions in each category and specific projects as we recommended during our evaluation of its initial proposed ISR Plan budget submitted October 21, 2011. The Company made adjustments as agreed upon with the Division and incorporated additional discussion of each category to more fully explain the requirements for the FY 2013 ISR Plan Proposed Budget. The Company's filed Section 2, Attachment 1; Charts 4 and 6 are each consistent with the derived budget by category and project as agreed to between the Company and the Division.

VEGETATION MANAGEMENT PROGRAM

My evaluation of the Vegetation Management Program was performed on multiple levels. First, I considered the overall Company reliability indices and determined they have

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continued to remain better than the Commission's benchmarks. Second, I carefully considered the Company's justification for its more aggressive VM Program and its incorporation of an Enhanced Hazard Tree Mitigation ("EHTM") Program. The Company provided an excellent presentation to the Division and me on these programs. I found the Company has developed an industry leading program. I will address my concerns later in my testimony, which deal with the overall cost of the programs and the benefit cost analysis. Third, I evaluated the Company's anticipated reliability improvement and the justification for the proposed budget expenditures, considering both the Company's reliability performance and the present depressed economy. The Company and Division reached a compromise position balancing all of these issues and concerns.

The Company's initial ISR Plan submitted to the Division October 21, 2011 included \$8,485,000 for the VM Program including the EHTM Program. We fully support a vegetation management program that yields benefits commensurate with the program costs. The Division convinced the Company to reduce the VM Program budget to \$8,256,000, which remains consistent with the level proposed in FY 2012 (which was a 20% agreed reduction) and closely matches actual projected expenditures. I found the Company's estimated reliability improvement was based on data from a small portion of the system. I recommended a lower VM Program expenditure until such time as more data was available to support the Company's estimates. I recommended a slower transition from the historical VM Program to the Company's proposed more aggressive spending level once a more reliable database can be established to support higher levels for Vegetation Management that can truly be economically justified as currently speculated by the Company. In order to accurately measure the cost benefit of the VM and EHTM, the Company should utilize its Outage Management System and other systems to track its outages and reliability performance associated with VM and EHTM. The Company should utilize these

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systems to track the outages by circuit which have been addressed by the VM and EHTM and compare both the outage rates and cost of Damage/Failure versus the circuits that have not been a part of the cycle program. This will require that the Damage/Failure Capital Cost be subdivided into tree related and non-tree related and by circuit, identifying whether the circuit has been part of the VM and EHTM Program. This will allow a differentiation of Damage/Failure Capital Costs between circuits based on the Company's completion of VM and EHTM work. The key issue is how to quantify the impact of these preventative maintenance programs. On the first level of evaluation, National Grid currently collects outage statistics and categorizes the number of events and duration for each outage event. These outage statistics do provide a measure of tree related customer minutes interrupted (CMI); however, vegetation related outages are not subdivided into those that would have been mitigated by the EHTM Program. To address the first level of evaluation, the Division recommends that National Grid begins tracking vegetation related outages caused by hazard trees to supplement its current statistics. The second level of evaluation will need to address the operation and maintenance (O&M) expenses and capital costs attributable to vegetation outages. The Division recommends that National Grid begins tracking the associated expenses and capital costs incurred to restore the electric system after a vegetation related outage event. Once National Grid begins tracking these directly attributable costs, the Damage/Failure Capital Cost budget category can be evaluated more completely. Currently, it is not fully clear what portions of this budget category are driving the overall upward trend for this type of spending. Although escalation of labor, materials, and fuel costs is a major portion of the continued upward trend in costs, the Company has implemented no mechanism to track the cost benefit analysis of any preventive maintenance program, particularly the VM and EHTM Programs, for which it contends there is a distinct cost benefit. We have described above just one option for tracking the cost benefit.

The Company knows the full capabilities of its automated programs, including its Outage Management System and Global Information System and, therefore, the Company may suggest a more efficient and less labor intensive method for collecting the data and delivering to the Division a true cost benefit analysis between the cost of VM and EHTM and the savings to the Damage/Failure Capital Cost.

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The Division would recommend tracking the program benefits for the VM Program over 4 years, since this represents a complete VM Program cycle. The program's cost/benefit could then be reviewed annually based upon a rolling 4-year window. The evaluation could begin once National Grid began tracking the more detailed outage and accounting information as described previously. Trend lines for the Damage/Failure Capital Costs and VM and EHTM Programs could be compared with the outage trend lines and yield both a cost/benefit analysis and a reliability analysis. At the end of 4 years there should be a distinct pattern. The Company may wish to go back and gather historical information in order to start with a time frame that is prior to the implementation of a 4 year clearing cycle and the EHTM Programs. Additionally, there should be an inflation adjusted evaluation to eliminate annual aberrations due to price changes.

The following Chart compares the initial budget request and that adjusted to consensus with the Division.

Vegetation Management Proposed FY 2013 Spending

SPENDING RATIONALE	BUDGET CLASS	Initial FY2013 Proposed Budget (10-21-11)	PowerServices Adjustments	Filed FY2013 Proposed Budget (12-29-11)
Vegetation Management Program	Cycle Prune (Base)	5,150,000	-	5,150,000
	Cycle Prune (Recovery)	309,000	(309,000)	-
	Hazard Tree - EHTM	750,000	-	750,000
	Post Irene EHTM	367,000	-	367,000
	Sub-T (off & on road)	290,000	-	290,000
	Police/Flagman Detail	488,000	-	488,000
	All Other Activities	1,131,000	80,000	1,211,000
Vegetation Management Program Total		8,485,000	(229,000)	8,256,000

The Cycle Trimming Recovery cost was removed. However, \$80,000 needed to be added back for spot trimming that was a part of the \$309,000 removed.

INSPECTION AND MAINTENANCE PROGRAM

I started my evaluation of the Company's Inspection and Maintenance Program by reviewing in detail all of the Capital Projects and the O&M Expenses included in the October 21,

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2011 Initial ISR Plan submitted to the Division. Through the iterative process, I established there was a certain level of redundancy associated with the transition from the prior programs to the I&M Program and its processes begun in FY 2012. I concur with the Company's proposed I&M Program processes based on its maturity of the Feeder Hardening and reliability programs that were an outgrowth of the Reliability Assessment Project from 2001. The three major areas are the new I&M Program, the Potted Porcelain Cutout Replacement Program, and the completion of the Feeder Hardening Program. The Company's initial request was for \$8,996,500 in these three areas of Capital and Expense spending. The Company has agreed with the Division to reduce this to \$6,785,900. The resulting \$4,515,000 in I&M Program capital costs are included in the proposed \$56.5 million capital budget with the remaining \$2,270,900 in O&M expenses reported as a separate I&M Program budget item. The Chart below shows the adjustments from the original request of October 2011 to the December filing.

Inspection and Maintenance Proposed FY 2013 Spending

SPENDING RATIONALE	BUDGET CLASS	Initial FY2013 Proposed Budget (10-21-11)	PowerServices Adjustments	Filed FY2013 Proposed Budget (12-29-11)
Inspection and Capital (1)		5,785,000	(1,250,000)	4,515,000
Maintenance Program	Opex related to Capex	2,246,500	(770,000)	1,476,500
	Repair - Related Costs	800,000	(191,000)	609,000
	Inspections - Related Costs 2	185,400	-	185,400
Subtotal Operation and Maintenance Expenses		3,231,900	(961,000)	2,270,900
Inspection and Maintenance Program Total		8,996,900	(2,211,000)	6,785,900

(1) The capital costs shown here are included in the proposed \$56.5M capital plan.

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CONCLUSION

The collaborative process between the Company and the Division resulted in an ISR Plan which sets forth a capital budget, VM Program and I&M Program, and associated O&M activities which balances the need for safety and reliability with the efficient benefit/cost considerations. The Chart on the following page summarizes, by spending rationale (category) and individual budget class, within each category between the Company's initially proposed ISR Plan October 21, 2011 and the resulting December filing of the ISR Plan FY 2013 Proposed Budget. While the Budget for the Statutory/Regulatory and Damage/Failure portions of the FY 2013 Proposed Budget were not adjusted for reasons previously discussed, adjustments were achieved in the other capital and O&M categories through a cooperative process of balancing cost with safety and reliability. The Chart on the following page also reflects the initial budget request in the October filing and the adjustments, which resulted in the consensus with the Division and final budget as filed on December 29, 2011 for FY 2013.

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Summary Chart

Capital Outlays by Key Driver Category and Budget Classification

SPENDING RATIONALE	BUDGET CLASS	Initial FY2013 Proposed Budget (10-21-11)	PowerServices Adjustments	Filed FY2013 Proposed Budget (12-29-11)
Statutory/Regulatory	3rd Party Attachments	705,000	-	705,000
	Land and Land Rights - Dist	297,000	-	297,000
	Meters - Dist	1,815,000	-	1,815,000
	New Business - Commercial	5,950,000	-	5,950,000
	New Business - Residential	3,304,000	-	3,304,000
	Outdoor Lighting - Capital	571,000	-	571,000
	Outdoor Lighting - Capital MV	-	-	-
	Public Requirements	3,709,000	-	3,709,000
	Transformers & Related Equipment	3,655,000	-	3,655,000
Statutory/Regulatory Total		20,006,000	-	20,006,000
Damage/Failure	Damage/ Failure	9,772,000	-	9,772,000
	Major Storms - Dist	650,000	-	650,000
Damage/Failure Total		10,422,000	-	10,422,000
Subtotal Statutory/Regulatory - Damage/Failure		30,428,000	-	30,428,000
Asset Condition	Woonsocket & Related	825,000	-	825,000
	Asset Replacement	8,583,000	-	8,583,000
	Asset Replacement - I&M (NE)	2,500,000	(1,250,000)	1,250,000
	Substation Capital - Dist	-	-	-
	Safety	-	-	-
	Add: Flood Related Capital and Studies	1,205,000	-	1,205,000
Asset Condition Total		13,113,000	(1,250,000)	11,863,000
Non-Infrastructure	Corporate/Admin/General Facilities	-	-	-
	General Equipment	186,000	-	186,000
	Telecommunications Capital - Dist	150,000	-	150,000
Non-Infrastructure Total		336,000	-	336,000
System Capacity and Performance	Coventry & Related	975,000	-	975,000
	Hopkinton & Related	800,000	-	800,000
	Newport & Related	450,000	-	450,000
	West Warwick & Related	325,000	-	325,000
	Load Relief	5,576,000	-	5,576,000
	Reliability	4,497,000	(210,000)	4,287,000
	Reliability - FEEDER HARDENING	1,500,000	-	1,500,000
System Capacity and Performance Total		14,123,000	(210,000)	13,913,000
Grand Total		58,000,000	(1,460,000)	56,540,000
Vegetation Management Program	Cycle Prune (Base)	5,150,000	-	5,150,000
	Cycle Prune (Recovery)	309,000	(309,000)	-
	Hazard Tree - EHTM	750,000	-	750,000
	Post Irene EHTM	367,000	-	367,000
	Sub-T (off & on road)	290,000	-	290,000
	Police/Flagman Detail	488,000	-	488,000
	All Other Activities	1,131,000	80,000	1,211,000
Vegetation Management Program Total		8,485,000	(229,000)	8,256,000
Inspection and Maintenance Program	Opex related to Capex	2,246,500	(770,000)	1,476,500
	Repair - Related Costs	800,000	(191,000)	609,000
	Inspections - Related Costs 2	185,400	-	185,400
Inspection and Maintenance Program Total		3,231,900	(961,000)	2,270,900

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There will be numerous challenges in the near term through FY 2016. While many of the same competing interests of safety, reliability, benefit to cost, and economic pressures will need to be considered going forward, the Division has established a number of important areas of consideration for the Company in establishment of future budgets. The flood related mitigation projects will potentially account for as much as ten percent (10%) of the capital budget over FY 2014 and FY 2016. It will be critical to carefully evaluate the risk mitigation benefits associated with the flood related projects developed during the FY 2013 engineering studies to be completed. I re-emphasize my recommendation that the approval for the flood mitigation engineering studies budgeted in FY 2013 does not automatically approve the flood related projects in future years.

I support the FY 2013 Capital Budget as proposed at \$56,540,000 with a value for the capital placed in to service in FY 2013 plus cost of removal at \$58,441,000. I also support the FY 2013 proposed VM Program at \$8,256,000 and the I&M Program Capital and Expense Total Costs at \$6,785,900.

Furthermore, I am a proponent for an annual adjustment process for the categories of Statutory/Regulatory and Damage/Failure.

This concludes my Memorandum on the FY 2013 ISR Plan filing evaluation.