STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION

The Narragansett Electric Company
d/b/a National Grid

Docket No. 4857

RE: Adoption of Performance Incentives Pursuant to R.I. Gen. Laws §39-1-27.7.1(e)(3) to Apply to Electric ISR Plan

PREFILED DIRECT TESTIMONY OF

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

April 9, 2019

Prepared by:
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Prefiled Direct Testimony of

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

Examiners for Engineering and Surveying. My curriculum vitae is included in Appendix GLB-1.

Q. ARE YOU A MEMBER OF ANY PROFESSIONAL SOCIETIES?

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

Q. PLEASE BRIEFLY DESCRIBE YOUR EXPERIENCE WITH ELECTRIC UTILITIES.

A. I have worked in the area of electric utility and telecommunication engineering and management services since 1963. I have been actively involved in all aspects of electric utility planning, design and construction, ranging from generation, transmission and distribution through customary service including, but not limited to, metering and communication systems. I have provided services to many regulatory agencies, and hundreds of electric utilities. My experience includes work on grid modernization planning and design and implementation ranging from Advanced Metering Infrastructure ("AMI"), Geographic Information System ("GIS") and self-healing circuits to micro-grid installations with battery storage systems. My experience spans metering from electromechanical meters to digital meters, automated meter reading (AMR) systems, and

advanced metering infrastructure and the communications options and infrastructure. Our sister companies manufacture and install a wide range of LED lights and controls from commercial and industrial applications to utility applications. These include major energy efficiency applications such as conversion to LED lighting with dimming and off/on controls for light consumption optimization. I have assisted utility clients in their selection of LED lights for enhanced energy efficiency and cost reduction, along with street and area lighting rate designs. I have been providing services in Rhode Island and other portions of New England for over 30 years.

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

A. Yes. I have testified before the Rhode Island Public Utilities Commission on numerous matters, including Docket Nos. 2489, 2509, 2930, 3564, 3732, 4029, 4218, 4237, 4307, 4360, 4382, 4473, 4483, 4513, 4539, 4592, 4614, 4682, 4770/4780, 4783, 4915, D-11-94, and D-17-45. My testimony in Rhode Island has included filed and live testimony on previous Electric Infrastructure, Safety and Reliability Plan Fiscal Year Proposal filings by National Grid in Docket Nos. 4218, 4307, 4382, 4473, 4539, 4592, 4682, 4783, and 4915.

Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT BEFORE STATE UTILITY COMMISSIONS AND OTHER REGULATORY AGENCIES?

A. Yes. I have testified on numerous occasions before the FERC, including pre-filed testimony in both wholesale rate matters as well as in electric utility reliability matters and facility connection standards, including Duke Energy and Dominion Energy dockets. I have also testified before the Connecticut Public Utilities Regulatory Authority, Delaware Public Service Commission, Maine Public Utilities Commission, Maryland Public Service Commission, Massachusetts Department of Public Utilities, Minnesota Department of

Public Service Environmental Quality Board, New Jersey Public Utilities Commission, North Carolina Utilities Commission, Pennsylvania Public Utility Commission, Rhode Island Public Utilities Commission, and the Virginia State Corporation Commission. My testimony before most of these Commissions has been provided on numerous occasions.

Q. HAVE YOU BEEN ACCEPTED AS AN EXPERT BEFORE STATE OR FEDERAL COURTS?

A. Yes. I have been accepted as an expert in the area of electrical engineering and electric utility engineering, construction and reliability matters and the National Electrical Safety Code ("NESC"), National Electrical Code ("NEC"), Occupational Health and Safety Administration ("OSHA"), Electromagnetic Field ("EMF"), and forensic engineering, including standard and customary utility operation practices in the electric utility industry and the electric industry before 17 state and federal courts.

II. PURPOSE OF TESTIMONY

Q. HAVE YOU REVIEWED THE FILINGS OF NARRAGANSETT ELECTRIC COMPANY D/B/A NATIONAL GRID ("NATIONAL GRID" OR "COMPANY") IN THIS MATTER?

A. Yes, I have reviewed the documents the Company has filed in Docket No. 4857, including its responses to data requests.

Q. HOW HAVE YOU ORGANIZED YOUR TESTIMONY?

A. Section I of my testimony provides an introduction and a summary of my background and experience. Section II addresses the purpose of my testimony. Section III provides an overview the Infrastructure, Safety and Reliability ("ISR") Plan processes, and a discussion of how the Capital Efficiency Mechanism ("CEM") correlates with this process.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide an overview of the ISR Plan process and how it will relate to the CEM. My testimony will briefly summarize National Grid's current distribution planning and annual ISR Plan budgeting procedures, the Company's historical performance in capital project and budget management, areas of planning improvements, cost recovery mechanisms, and correlation with a proposed CEM.

III. ISR PLAN RELATION TO CAPITAL EFFICIENCY MECHANISM

Q. BRIEFLY DESCRIBE THE COMPANY'S CURRENT DISTRIBUTION PLANNING PROCESS AND YOUR SPECIFIC INVOLVEMENT.

A. Yes. Each year, pursuant to R.I. General Laws 39-1-27.7.1(c)(2), the Company prepares and submits an ISR Plan for the following fiscal year. The Division and Company cooperate in good faith to reach an agreement on a proposed ISR Plan over sixty (60) days, and, to the extent there is mutual agreement, the Company files a proposed plan with the Commission for review and approval within ninety (90) days. For all of the ISR proceedings to date, I have acted as engineering consultant for the Division in performing a review of the ISR Plan. My evaluation includes an assessment of each proposed project or program, involving multiple data requests and discussions with the Company regarding the need and level of spend for the proposed capital investment. This process results in project and budget adjustments, culminating in a more comprehensive and prudent spending plan supported by sound engineering practices. Additionally, on behalf of the Division, I have proposed enhancements to the distribution planning process that have been adopted by the Commission within the approval process. There are currently multiple recommendations from the Division that the Company follows to augment each ISR Plan proposal, which range from a requirement for supporting data, such as cost/benefit for certain programs, to the need for a System Capacity Load Study and 10-year Long Range Plan to identify major projects prior to inclusion in the ISR Plan.

Q. WHAT ARE THE STRUCTURE OF THE ISR PLAN AND HISTORICAL LEVEL OF SPEND?

A. The Company designates ISR Plan capital investment under either non-discretionary or discretionary spending categories. The non-discretionary budget categories are Customer

Request/Public Requirements (previously Statutory/Regulatory) and Damage/Failure. The discretionary categories are Asset Condition, System Capacity and Performance, and Non-Infrastructure. The Company also includes Vegetation Management, removal costs, and certain operational expenses ("Opex") related to capital. Excluding Vegetation Management, removal cost, and Opex, the Company expended $46 million in FY 2006 and is currently proposing a budget of $102 million in the FY 2020 filing. Roughly 60% of total capital spend in the earlier ISR Plans was attributed to the non-discretionary category. Spending over the past several years has shifted, and the Company is now executing discretionary projects that comprise 60% to 70% of the total budget. Chart 1 below is the Company's historical spend by category and Chart 2 below provides detail regarding the proposed spend for the FY 2020 ISR Plan (reference National Grid's FY 2020 ISR Plan proposal, Docket 4915, Section 2, pages 9 and 11):

Chart 1 – National Grid ISR Plan Capital Spend

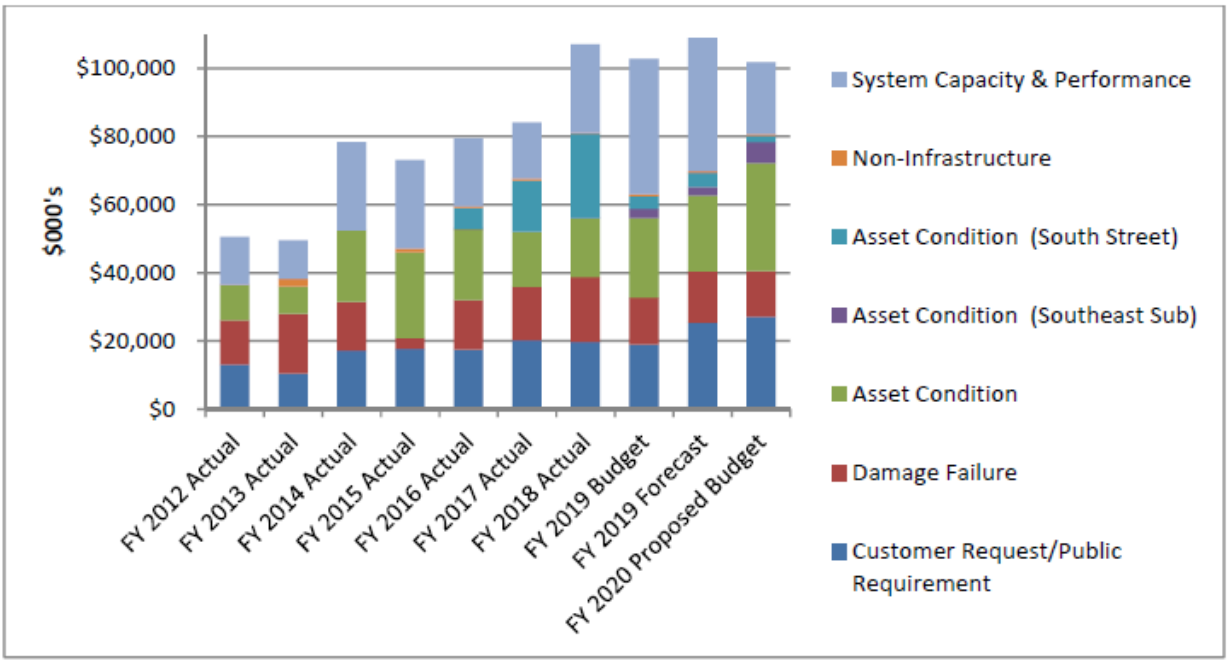


Chart 2 – National Grid Proposed FY 2020 ISR Plan

Spending Rationale	FY 2020 Proposed Budget	%
Customer Request/Public Requirement	$27,025	26.5%
Damage Failure	$13,505	13.3%
Subtotal Non-Discretionary	$40,530	39.8%
Asset Condition	$33,425	32.8%
Non-Infrastructure	$550	0.5%
System Capacity & Performance	$21,045	20.7%
Subtotal Discretionary	$55,020	54.0%
Asset Condition - Southeast Sub Project	$6,250	6.1%
Subtotal Discretionary	$61,270	60.2%
Total Capital Investment in Systems	**$101,800**	**100%**

Q. HOW DOES THE COMPANY DERIVE ITS ANNUAL ISR PLAN BUDGET?

A. The Company determines required capital spend through various methods. For non-discretionary categories, historical trending along with known customer driven projects and economic changes are used to forecast spend. The discretionary categories use historical trending for certain programmatic expenses, such as underground cable replacement projects, and adds proposed projects that the Company identifies through system capacity and asset condition assessments. According to the Company, plan inclusion/exclusion for any given project is based on several different factors, including, but not limited to, new project or in-progress status; a Company assigned risk score; scalability; and resource availability. The portfolio of projects and associated capital budget are approved by the Company's president, which then establishes the proposed ISR Plan.

Q. DOES THE COMPANY CONSIDER ADDITIONAL FACTORS WHEN DETERMINING SPECIFIC PROJECTS FOR INCLUSION IN THE ISR PLAN?

A. Yes. For many years, the system assessments performed by the Company to determine potential discretionary projects lacked an organized approach. Significant projects

appeared in the capital plan that were compelled by isolated system studies that failed to take into account broader system needs. Some of these projects were significant in terms of scope and budget. The South Street Substation rebuild, for example, included a budget line item in five consecutive ISR Plans and ultimately cost over $50 million. Through iterative discussions with the Company, and with endorsement of the Commission, a more formal process is now required to support major discretionary projects. The Company has agreed to perform engineering studies for geographic areas of the system ("Area Studies") which produces a Long-Range Plan, or essentially a list of targeted projects that are required over the next 10-15 years to maintain a safe and reliable system. For projects identified as solutions within a study, the Company produces a cost estimate and construction schedule to create a budget for major projects, or those exceeding $1 million. The projects are considered discretionary and fall under either the System Capacity and Performance, or Asset Condition spending rationales. Many major projects span 2-3 years and even longer, creating capital requirements across several ISR Plans. The Company budgets and tracks major projects separately from other ISR Plan categories. For the proposed FY 2020 ISR Plan, major projects compelled by Area Studies are budgeted at $33 million, or over half of the Company's proposed $61 million discretionary budget.

Q. PLEASE EXPLAIN THE COMPANY'S CURRENT PROJECT APPROVAL PROCESS?

A. The Company obtains project approvals in accordance with its internal Delegation of Authority (DOA) governance policy. The DOA requires an appropriate level of management authorization prior to the start of any work, including engineering and construction. Projects under $1 million are authorized online, where the project sponsor provides information on the cost and justification for the project. Projects over $1.0 million,

or major projects, require a Project Sanction Paper (PSP) that provides additional details, including project background, drivers, business issues, alternatives, cost analysis, schedule and implementation plan. Once a major project advances, it may be subject to reauthorization if the Company expects project costs to exceed the approved estimate plus an approved variance range identified in the project spending plan. Lastly, when a major project is completed, the project manager is responsible for preparing closure papers which include information on a number of factors, such as a discussion of whether, and to what extent, project deliverables were achieved, and lessons learned as a result of project implementation.

Q. WHEN PREPARING COST ESTIMATES, IS THE COMPANY REQUIRED TO ACHIEVE A SPECIFIC LEVEL OF ACCURACY IN THE PROJECT APPROVAL PROCESS, AND HOW DOES THAT ESTIMATE RELATE TO THE ISR PLAN?

A. The Company advances proposed capital projects through a series of cost estimate levels of increasing accuracy throughout the approval process. National Grid defines four levels of estimate grade accuracy: (1) Investment = +200/-50%; (2); Conceptual =+50/-25%; (3) Planning = +25/-25%; and (4) Project = +10/-10%. Each project transitions through these estimate grades as engineering and design are refined. According to the Company, the Investment Grade level is used as an order of magnitude amount for enabling project approval and initiating the project's start and design. The Company strives to reach a Project Grade level, or +10%/-10% accuracy, for projects that require construction in the upcoming fiscal year. The Division expects that a Project Grade level will be achieved before a project is included in the ISR Plan. The Company and Division's objectives are similar, although the Division would desire a higher level of refinement earlier in the ISR Planning process.

Q. WHAT IS THE COMPANY'S HISTORICAL PERFORMANCE ON ISR PLAN ACTUAL CAPITAL SPEND AS COMPARED TO BUDGET?

A. Overall, for the eight years from FY 2006 through FY 2013, the Company trended both over and under budget with variances ranging from approximately +/-15%, as shown in Chart 3. A pivotal point occurred with the FY 2014 ISR Plan where the Company exceeded budget by $18 million, or 31%. A key driver was a $13 million spending variance in the System Capacity and Performance category, reflecting increased costs for completion of a significant number of discretionary projects. Beginning with FY 2015, ISR Plan expenditures have been consistently over budget with the variance averaging 6%. Although the Company has improved its forecasting and execution of the overall ISR Plan over time, there remain areas of improvement for individual project estimates.

Chart 3 – National Grid ISR Plan Variance

ISR Plan ($000)	Budget	Actual	% Variance
FY 2006	43,945	45,762	4%
FY 2007	45,045	51,384	14%
FY 2008	52,819	58,033	10%
FY 2009	57,659	55,339	-4%
FY 2010	68,500	58,272	-15%
FY 2011	46,900	45,121	-4%
FY 2012	61,900	51,810	-16%
FY 2013	56,540	49,515	-12%
FY 2014	59,600	78,042	31%
FY 2015	65,980	73,051	11%
FY 2016	73,300	79,500	8%
FY 2017	83,441	84,113	1%
FY 2018	100,621	107,058	6%
FY 2019*	102,767	108,861	6%

**FY 2019 Actual is forecasted*

Q. WHAT HAS CONTRIBUTED TO THE OVERALL IMPROVED BUDGETING PROCESS, AND WHAT ARE REMAINING AREAS OF DEFICIENCIES?

A. The formal process to support major projects that I referenced earlier in my testimony has created a significant improvement. Additionally, the Company's more detailed and

rigorous sanctioning process has improved cost estimates and project implementation. Starting with the FY 2015 ISR Plan evaluation, I recommended that National Grid initiate a 10-year system capacity modeling plan ("Long-Range Plan") to increase the level of support and transparency for the capital budget. This Long-Range Plan is critical to the overall capital investment strategy for building and maintaining a robust and reliable electric system. The Company is required to submit reports on modeling activities and provide Area Studies that create the Long-Range Plan for Division review in advance of including projects in the ISR Plan. The Company has methodically implemented this process, leading to increased transparency in the scope, timing, and budget of upcoming major projects. This has mitigated reactionary planning, but there remains an opportunity for the Company to improve its individual project budgeting process. In previous years, the Company included ISR Plan projects that could be as high as Investment Grade, or +200%/-50%, as the project advanced through preliminary engineering. The Division has been highly critical of the concept that a project's actual cost could reach 200% of its initial cost estimate upon completion. As a result, the Company maintains that initial cost estimates for projects in Area Studies that ultimately shift to the ISR Plan are now considered Conceptual Grade, or +50%/-25%. This is a significant improvement, and the Division anticipates that the Company will continue its efforts to improve scope and cost estimate accuracy at project inception to minimize variances once capital projects are implemented.

Q. ARE THERE LIMITS TO THE AMOUNT OF CAPITAL INVESTMENT THAT THE COMPANY CAN RECOVER EACH YEAR?

A. There are defined metrics that guide annual capital recovery amounts. Specifically, the recovery mechanism dictated by *The Narragansett Electric Company Infrastructure,*

Safety and Reliability Provision (RIPUC No. 2199) bases discretionary capital investment recovery on the lesser of actual plant in service or approved capital spending, plus related cost of removal recorded by the Company for a given fiscal year. In essence, if the Company's actual discretionary spend is lower than actual plant in service, yet exceeds the approved spending plan for a given fiscal year, or ISR Plan budget, the Commission is provided latitude to allow recovery for the budget and not actual cost. The CEM will be an enhancement to this provision and should further encourage project efficiency.

Q. DOES THE COMPANY RECOVER ITS ISR PLAN CAPITAL INVESTMENTS WHEN ACTUAL SPEND EXCEEDS BUDGET?

A. Historically, yes. Throughout each fiscal year, the Company prepares quarterly updates on the progress of its ISR program. These reports include a discussion of project status, budget variances, and year-end forecast for each capital spending category. The Company, as part of a Commission requirement, also provides explanations for the portfolio of large projects with variances that exceed +/-10% of the annual fiscal year budget. At the end of a fiscal year, the Company provides a reconciliation report outlining the proposed budget, actual spend, and amount of requested recovery based on plant in service. The Commission approves the reconciliation and rate factor to assess charges to ratepayers. Although the Company has exceeded forecasted budget in many years, and ultimately requested recovery for plant in service amounts that were greater than anticipated, the Commission has not disapproved recovery. The reason for acceptance is that the Company goes through a comprehensive pre-file process that provides the Commission and stakeholders the opportunity to evaluate the reasonableness and prudency of planned capital additions prior to implementation, unlike many states that are left to approve capital expenses after the Company executes projects. Therefore, the reconciliation process is primarily an

accounting exercise to apply a recovery factor and, although the Commission may disallow recovery after a project is implemented, it would be very difficult given the robust pre-file approval process unless the Company grossly deviates from its proposed plan, which has not been the case to date.

Q. WILL THE CEM CHANGE THE ISR PLAN OR RATE RECOVERY PROCESS?

A. No, the ISR Plan process will not be altered and requirements under R.I. §39-1-27.7.1 will continue to be met, consistent with previous years. The Company's capital investments will be recorded and treated for ratemaking in accordance with current procedures. The CEM is a separate and external effort that evaluates the performance of specific projects within the ISR Plan, and provides the Company with potential rewards or penalties based on the outcome of those projects. The CEM is also consistent with statute 39-1-27.7.1.

Q. HOW WILL THE CEM BE APPLIED?

A. The CEM is intended to target projects emanating from Area Studies that individually, or as a related group, exceed $500,000. The projects will be evaluated when proposed within the ISR Plan in terms of alignment with the outcome of the Area Study. The scope and estimated cost will be subject to detailed review. The Company will be expected to produce a Project Grade estimate level of +10%/-10% prior to construction, which is also the baseline budget for the CEM. Once the total project is complete and placed in service, the actual cost will be compared to the baseline budget. Underspend or overspend exceeding a bandwidth will be assessed an incentive or penalty, respectively.

Q. WILL EACH PROJECT BE SUBJECT TO A CEM CALCULATION EVERY YEAR?

A. No, the CEM calculation only applies to a project once it is placed in service and eligible to be incorporated in the Company's rate base. For multi-year projects, or those major projects incurring spend across consecutive ISR Plans, the CEM evaluation will apply after project completion. The CEM calculation takes into account the total spend across all years as compared to the baseline budget, and is not an annual assessment of partial project construction costs. The exception would be a project that begins and ends in the same fiscal year, basically incurring all spend in the same year. This scenario is generally rare, since projects considered for CEM are complex and often require several years for engineering, permitting and construction.

Q. HOW WILL THE CEM DISCOURAGE THE COMPANY FROM INFLATING PROJECT ESTIMATES TO INCREASE THE LIKELIHOOD OF RECEIVING AN INCENTIVE?

A. The Division will have access to multiple data points to evaluate the project scope and baseline budget used in the CEM. First, Area Studies can be used as an initial screen. For each project, an Area Study provides a timeline, limited project scope and initial budget which the Company identifies as a Conceptual Grade estimate, or +50%/-25%. The Division has access to the studies and can compare a project, once proposed in the ISR Plan, against its corresponding Area Study. Once the project moves through the Company's sanctioning process, estimates are refined to Planning Grade, or +25%/-25%, and then to Project Grade at +10%/-10%. During this evolution, the Division will require Project Sanctioning Papers for projects that exceed $1 million or equivalent documentation for projects between $500,000 and $1 million, along with comprehensive construction estimates that are prepared in support of the project. As the Division's engineering consultant, I will compare the construction estimates to actual cost data from comparable projects implemented by the Company to publically available data, or data available from

my experience with utilities in a similar geographic region. This collective data will be used to verify the baseline budget used in the CEM. Information required of the Company to ascertain the reasonableness of cost estimates, and to ensure that the Company is not arbitrarily assigning inflated estimates, may be requested and evaluated as part of, or in addition to, the ISR Plan evaluation.

Q. WILL THE CEM ASSESS PENALTIES FOR OVERSPEND IF THE COMPANY EXPERIENCES UNCONTROLLABLE FACTORS THAT INCREASE PROJECT COSTS?

A. No, the CEM is not intended to penalize for contributing factors that cannot be reasonably controlled or mitigated by the Company. Each project will be independently assessed as it progresses and at the time of closure. The Division will have an opportunity for ongoing status review through the Company's annual ISR Plan process and quarterly reports, which will allow for detailed discussion of project scope variances. Additionally, for projects above $1 million, closure papers produced by the Company and any applicable reauthorization papers will be evaluated once the project is placed in service. These reviews may result in a proposed waiver of overspend that would be taken into account when determining the Company's performance relative to the baseline budget.

Q. IS THE PROPOSED CEM LIMITED TO DISCRETIONARY PROJECTS?

A. At this time, the Division proposes that the CEM apply only to discretionary projects since those initiatives are aligned with specific studies, require Company documentation for cost estimates and approvals, and can be readily monitored. Major discretionary projects also comprise $33 million, or approximately one-third, of the total FY 2020 ISR Plan capital budget, and forecasts indicate similar levels of spend in future years. Carving out a portion of the ISR Plan in order to test the effectiveness of a CEM will serve as a template to

expand a performance mechanism to other categories of capital investment. Examples include the Company's discretionary Inspection & Maintenance Program, which is designed to proactively inspect the system and schedule minor repairs to enhance safety and reliability. To the extent that the Company prepares comprehensive plans for ISR Plan components that require significant spend in the future, such as invasive species management in Vegetation Management, or a portfolio of Grid Modernization projects, the CEM may be considered to incentivize efficiencies.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

AFFIDAVIT OF GREGORY L. BOOTH, PE

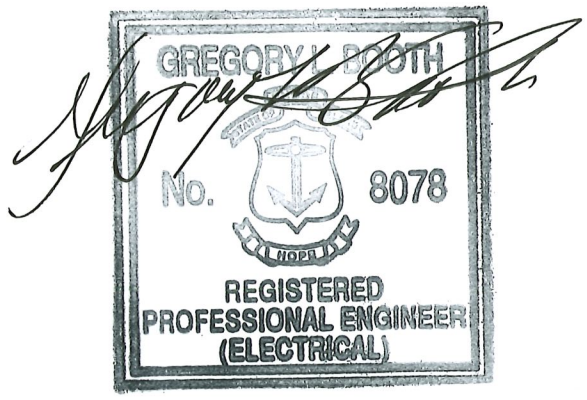
Gregory L. Booth, does hereby depose and say as follows:

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 9th day of April, 2019.

Gregory L. Booth

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



Gregory L. Booth, PE

APPENDIX
GLB-1

RESUME OF
GREGORY L. BOOTH, PE, PLS
President
PowerServices, Inc.

Gregory L. Booth is a registered professional engineer with engineering, financial, and management services experience in the areas of utilities, industry private businesses and forensic investigation. He has been representing over 300 clients in some 40 states for more than 50 years. Mr. Booth was inducted into the North Carolina State University Electrical and Computer Engineering Alumni Hall of Fame in November of 2016 based on his accomplishments in the field of engineering.

Mr. Booth has been accepted as an expert before state and federal regulatory agencies, including the Federal Energy Regulatory Commission, the Delaware Public Service Commission, the Florida Public Service Commission, the Minnesota Department of Public Service Environmental Quality Board, the Maine Public Utilities Commission, the Massachusetts Department of Public Utilities, the New Jersey Board of Public Utilities, the North Carolina Utilities Commission, the Pennsylvania Public Utility Commission, the Rhode Island Public Utilities Commission, and the Virginia State Corporation Commission. He has been accepted as an expert in both state and federal courts, including Colorado, Delaware, District of Columbia, Florida, Georgia, Kansas, Maryland, Minnesota, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, Texas, Virginia, West Virginia, Virgin Islands, and Wisconsin, and numerous Federal Court jurisdictions. Mr. Booth has provided expert witness services on over 500 tort case matters, and over 50 regulatory matters. Investigation and testimony experience includes areas of wholesale and retail rates, utility acquisition, territorial disputes, electric service reliability, right-of-way acquisition and impact of electromagnetic fields and evaluation of transmission line options for utility commissions.

Additionally, Mr. Booth has extensive experience serving as an expert witness before state and federal courts on matters including property damage, forensic evaluation, fire investigations, fatality, and areas of electric facility disputes and Occupational, Safety and Health Administration violations and investigations together with National Electrical Code and National Electrical Safety Code and Industry Standard compliance.

The following pages provided are the education and experience from 1963 through the present, along with courses taught and publications.

RESUME OF
GREGORY L. BOOTH, PE, PLS

Mr. Booth is a Registered Professional Engineer with engineering, financial, and management experience assisting local, state, and federal governmental units; rural electric and telephone cooperatives; investor owned utilities, industrial customers and privately owned businesses. He has extensive experience representing clients as an expert witness in regulatory proceedings, private negotiations, and litigation.

PROFESSIONAL EDUCATION:	NORTH CAROLINA STATE UNIVERSITY; Raleigh NC, Bachelor of Science, Electrical Engineering, 1969
PROFESSIONAL HONORS:	Inducted into North Carolina State University Department of Electrical and Computer Engineering Alumni Hall of Fame in November 2016.
REGISTRATIONS:	Registered as Professional Engineer in Alabama, Arizona, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Kansas, Maryland, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Texas, Commonwealth of Virginia, West Virginia, and Wisconsin Professional Land Surveyor in North Carolina Council Record with National Council of Examiners for Engineering and Surveying

EXPERIENCE:

1963-1967 Booth & Associates	Transmission surveying and design assistance, substation design Technician assistance; distribution staking; construction work plan, long-range plan, and plan, and sectionalizing study preparation assistance for many utilities, including Cape Hatteras EMC, Halifax EMC, Delaware Electric Cooperative, Prince George Electric Cooperative, A&N Electric Cooperative; assistance generation plant design, start-up, and evaluations.
1967-1973 Project Engineer Booth & Associates	Transmission line and substation design; distribution line design; long-range and construction work plans; rate studies in testimony before State and Federal commissions; power supply negotiations; all other facets of electrical engineering for utility systems and over 30 utilities in 10 states.
1973-1975 Engineer 1975-1994 Executive Vice President Booth & Associates	Directed five departments of Booth & Associates, Inc.; provided Professional engineering services to electric cooperatives and other public Booth & Associates power utilities in 23 states; provided expert testimony before state regulatory commissions on rates and reliability issues; in accident investigations and tort proceedings; transmission line routing and designs; generation plant designs; preparation and presentation of long-range and construction work plans; relay and sectionalizing studies; relay design and field start-up assistance; generation plant designs; rate and cost-of-service studies; reliability studies and analyses; filed testimony, preparation and teaching of seminars; preparation of nationally published manuals; numerous special projects for statewide organizations, including North Carolina EMC. Work was provided to over 130 utility clients in 23 states, PWC of the City of Fayetteville, NC, Cities of Wilson, Rocky Mount and Greenville are among the utilities in which I have provided engineering services in North Carolina during this time frame. Services to industrial customers include Texfi Industries, Bridgestone Firestone, Inc and many others.
1994-2004 President Booth & Associates	Responsible for the direction of the engineering and operations of Booth & Associates, Inc. for all divisions and departments. The engineering work during this time frame has continued to be the same as during 1974 through 1993 with the addition of greater emphasis on power supply issues, including negotiating power supply contracts for clients; increased involvement in peaking generation

projects; development of joint transmission projects, including wheeling agreements, power supply analyses, and power audit analyses. The work during this time frame includes providing services to over 200 utility clients across the United States, including NCEMC and NRECA.

2004-Present
President
Gregory L. Booth, PLLC

Providing engineering and management services to the electric industry, including planning and design. Providing forensic engineering, product evaluation, fire investigations and accident investigation, serving as an expert witness in state and federal regulatory matters and state and federal court.

2005-Present
President
PowerServices, Inc.

Providing engineering and management services to the electric industry, including planning and design and utility acquisition. Providing forensic engineering, product evaluation, fire investigations and accident investigation, serving as an expert witness in state and federal regulatory matters and state and federal court.

WORK AND EXPERTISE:

ELECTRIC UTILITIES:
(more than 300 clients)

- All aspects of utility planning, design and construction, from generation, transmission, substation and distribution to the end user.
- Utility acquisition expert, including providing condition assessment, system electrical and financial valuation, electrical engineering assessment, initial Work Plan and integration plans, acquisition loan funds, testimony, assessment and consulting services for numerous electric utility acquisitions. Utility clients for acquisition projects include Winter Park, FL acquisition of Progress Energy, FL, system in the City limits, A & N Electric Cooperative acquisition of the Delmarva Power & Light Virginia jurisdiction, Shenandoah Valley Electric Cooperative acquisition of Allegheny Energy Virginia jurisdiction, Rappahannock Electric Cooperative acquisition of Allegheny Energy Virginia jurisdiction, and numerous other past and currently active electric utility acquisitions.
- System studies, including long-range and short-range planning, sectionalizing studies, transmission load flow studies, system stability studies (including effects of imbalance and neutral-to-earth voltage), environmental analyses and impact studies and statements, construction work plan, power requirements studies, and feasibility studies.
- Fossil, hydro, microgrid, wind, and solar generation plan analysis, design, and construction observation.
- Transmission line design and construction observation through 230 kV overhead and underground, including interface with DOT and other utilities.
- Switching station and substation design and construction observation through 230 kV.
- Distribution line design and staking, overhead and underground, including interface with DOT and other utilities.
- Design of submarine cable installations. (Transmission and distribution)
- Supervisory control and data acquisition system design, installation and operation assistance.
- Load management system design, installation and operation assistance.
- Computer program development.
- Load research and alternative energy source evaluation.
- Field inspection, wiring, and testing of facilities.
- Relay and energy control center design.
- Mapping and pole inventories.

- Specialized grounding for abnormal lightning conditions.
- Ground potential rise protection.
- Protective system/relay coordination.
- Grid Modernization Plan development, regulatory testimony, and implementation
- Pole Attachment Agreements, rate design, and testimony

UTILITY OPERATIONS:

- Storm assessment services., including interface with DOT and other utilities
- Regulatory testimony on storm response.
- Storm Response Plan development.
- Operations, including outage management and Call Centers.
- Outage management and operations enhancement services and testimony.

GENERATION DESIGN / FAILURE ANALYSES:

- Intermediate and peaking generation (gas and oil fired to 400 MW).
- Peaking generation (diesel and gas through 10,000 kW)
- Wind generation.
- Solar (PV) generation.
- Hydroelectric generation.
- Microgrid, including energy storage.

TELECOMMUNICATION: UTILITIES:

- Subscriber and trunk carrier facilities design.
- Stand-by generation and DC power supplies
- DC-AC inverters for interrupted processor supplies.
- Plant design and testing.
- Fiber optics and other transmission media.
- Microwave design.
- Pole attachment designs and make-ready design.
- Pole Attachment Agreements and rental rates calculations.
- Regulatory testimony.

FINANCIAL SERVICES:

- Long-term growth analyses and venture analyses.
- Lease and cost/benefit analyses.
- Capital planning and management.
- Utility rate design and service regulations.
- Cost-of-Service studies.
- Franchise agreements.
- Corporate accounting assistance.
- Utility Commission testimony (State and Federal)

FORENSIC ENGINEERING:

- Compliance with NESC, NEC, OSHA, IEEE, ANSI, ASTM and other codes and industry standards, including DOT standards.
- Equipment and product failure and analysis and electrical accident investigation (high and low voltage equipment).
- Stray voltage, electrical shocking, and electrocution investigations.
- Building code investigations.
- New product evaluation.
- MCC, MDP failure analysis and arc flash analysis
- Electrical fire analysis

INDUSTRIAL/ELECTRICAL ENGINEERING:

- Building design (commercial and industrial).
- Building code application and investigation. (NFPA and NEC)
- Electric thermal storage designs for heating, cooling, and hot water.

- Standby generation and peaking generation design.
- Electric service design (residential, commercial, and industrial).

INSTRUCTIONAL SEMINARS AND TEXT:

- Seminars taught on arc flash hazards and safety, including National Electrical Safety Code regulations for utilities.
- Courses taught on Distribution System Power Loss Evaluation and Management.
- Courses taught on Distribution System Protection.
- Text prepared on Distribution System Power Loss Management.
- Text prepared on Distribution System Protection.
- Seminars taught on substation design, NESC capacitor application, current limiting fuses, arresters, and many others electrical engineering subjects.
- Courses taught on accident investigations and safety.
- Courses taught on Asset Management.
- Courses taught on OSHA and Construction Safety.

TESTIMONY AS AN EXPERT:

- Concerning rate and other regulatory issues before Federal Energy Regulatory Commission and state commissions in Connecticut, Delaware, Florida, Maine, Maryland, Massachusetts, Minnesota, New Jersey, New Hampshire, North Carolina, Pennsylvania, Rhode Island, and Virginia.
- Concerning property damage or personal injury before courts in Colorado, Delaware, District of Columbia, Florida, Georgia, Kansas, Maryland, Minnesota, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Puerto Rico, South Carolina, Texas, Virginia, West Virginia, Virgin Islands, and Wisconsin.

FIELD ENGINEERING:

- Transmission line survey and plan and profile.
- Distribution line staking.
- Property surveying.
- DOT highway relocation design.
- Relay and recloser testing.
- Substation start-up testing.
- Generation acceptance and start-up testing.
- Ground resistivity testing.
- Work order inspections.
- Operation and maintenance surveys.
- Building inspection and service facility inspection.
- Construction Management
    - Generation
    - Transmission
    - Substation
    - Distribution
    - Building Electrical Installations
    - GSA construction projects
    - NASA construction projects
    - University construction projects

PROFESSIONAL ORGANIZATIONS:

a. National Society of Professional Engineers (NSPE)
b. Professional Engineers in Private Practice (PEPP)
c. National Council of Examiners for Engineering & Surveying (NCEES)
d. Professional Engineers of North Carolina (PENC)
e. National Fire Protection Association (NFPA)
f. Associate Member of the NRECA

g. NRECA Cooperative Network Advisory Committee (NRECA-CRN)
h. The Institute of Electrical and Electronics Engineers (IEEE) (Distribution sub-committee members on reliability)
i. American Standards and Testing Materials Association (ASTM)
j. Occupational Safety and Health Administration (OSHA) Certification
k. American Public Power Association (APPA)
l. American National Standards Institute (ANSI)