

**STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES**

**IN THE MATTER OF THE PETITION OF
PUBLIC SERVICE ELECTRIC & GAS COMPANY
FOR APPROVAL OF THE SECOND ENERGY
STRONG PROGRAM (ENERGY STRONG II)**

BPU Docket Nos. EO18060629 and GO18060630

**PUBLIC SERVICE ELECTRIC AND GAS COMPANY
REBUTTAL TESTIMONY
OF
EDWARD F. GRAY
DIRECTOR – ELECTRIC TRANSMISSION AND
DISTRIBUTION ENGINEERING**

April 18, 2019

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1 **PUBLIC SERVICE ELECTRIC AND GAS COMPANY**
2 **REBUTTAL TESTIMONY**
3 **OF**
4 **EDWARD F. GRAY**
5 **DIRECTOR – TRANSMISSION AND DISTRIBUTION ENGINEERING**
6 **ENERGY STRONG II PROGRAM - ELECTRIC**

7 **I. INTRODUCTION**

8 **Q. Please state your name and title.**

9 A. My name is Edward F. Gray, and I am the Director of Transmission and Distribution
10 Engineering for Public Service Electric and Gas Company (PSE&G, or the Company), the
11 Petitioner in this matter.

12 **Q. Have you submitted testimony previously in this proceeding?**

13 A. Yes, I submitted direct testimony in support of the Company’s Energy Strong II Program
14 (the “Program” or “Energy Strong II”) as it relates to the electric delivery system.

15 **Q. What is the purpose of your rebuttal testimony?**

16 A. I offer the following testimony in response to the arguments raised in opposition to the
17 Energy Strong II Program by the Division of Rate Counsel (“Rate Counsel”) witnesses Dr. David E.
18 Dismukes and Mr. Charles Salamone and Mr. Maximilian Chang. Specifically, I explain why the
19 Energy Strong II electric projects should be approved as prudent in this proceeding, including how
20 the Program is consistent with the Board of Public Utilities (“BPU” or the “Board”) regulation and
21 policy. Additionally, I respond to the assertions and criticism of opposing witnesses regarding
22 the elements of the electric portion of the Program.

1 **II. SUMMARY**

2 **Q. Please summarize your key conclusions regarding the Direct Testimony of Rate**
3 **Counsel witnesses Dr. Dismukes, Mr. Salamone, and Mr. Chang.**

4 A. Based upon my review of the testimony submitted by Dr. Dismukes, Mr. Salamone and
5 Mr. Chang, my conclusions are as follows:

- 6 1. The Energy Strong II electric subprograms clearly meet the eligibility requirements for
7 improving the safety, reliability and resilience of the distribution system established by
8 the Infrastructure Investment Program (“IIP”) and Recovery Rule¹.
- 9 2. The subprograms proposed go well beyond “business as usual” spending to address both
10 storm resiliency and station life cycle needs, and are clearly aligned with IIP regulations.
- 11 3. PSE&G has met all the filing requirements defined by the IIP regulations and has
12 provided a significant amount of information in the testimony, cost benefit analysis, risk
13 model, discovery and technical conference to enable the Board to effectively evaluate the
14 programs.
- 15 4. By ignoring all non-monetized benefits and characterizing Substation projects as not
16 “cost effective”, Rate Counsel essentially argues to delay capital investment until such
17 time that another major flooding event happens or station performance degrades
18 significantly.
- 19 5. Once these foreseeable events occur, it can take years to effectively mitigate the impacts.
- 20 6. Based on the limits of the new tree trimming regulations and the impact of severe
21 weather these new regulations do not offset the value of the contingency reconfiguration
22 or proposed spacer cable work.

¹ *Infrastructure Investment and Recovery Rule*, N.J.A.C. 14:3-2A, issued January 16, 2018 (“IIP regulation” or “IIP rule”).

1 **III. THE PROPOSED ES II PROJECTS SHOULD BE APPROVED AS NECESSARY**
2 **AND PRUDENT IN THIS PROCEEDING**

3 **A. Energy Strong II is consistent with the IIP regulation.**

4 **Q. Please summarize why the Energy Strong II projects are appropriate investments**
5 **under the IIP regulation.**

6 A. Section 14:3-2A.1 of the IIP regulation states that appropriate investments include those
7 that “occur in a systematic and sustained way to advance construction, installation, and
8 rehabilitation of utility infrastructure needed for continued system safety, reliability, and
9 resiliency...” The Energy Strong II program is comprised of large infrastructure projects that are
10 scheduled to proceed over the course of five years, and go well beyond PSE&G’s normal
11 distribution investments. PSE&G is not offsetting “normal distribution spending” through the ES
12 II proposal, but rather is increasing investment beyond its normal level to provide the benefits
13 envisioned by the IIP regulation.

14 Assuming *arguendo* Rate Counsel’s calculation for PSE&G’s five year average
15 distribution spending is true, the Company’s average capital expenditures budget should be set at
16 \$223M dollars.² This five year average would reasonably be considered the “business as usual”
17 or baseline spending level. As noted on page 25, Schedule 7 of Messrs. Salamone and Chang’s
18 testimony, the proposed Energy Strong II program focuses on storm resiliency, life cycle
19 replacement, and advanced technology investment that significantly exceeds the five year
20 average. Regardless of one’s position on any individual project, the proposed program clearly
21 goes “above and beyond business as usual distribution spending”³ and reflects incremental
22 spending above PSE&G’s baseline investment to run a reliable electric distribution system.

² Salamone and Chang Testimony, at p. 23.

³ By Rate Counsel’s own account, incremental investments such as those proposed in the Program qualify for inclusion in an IIP. See Salamone and Chang Testimony, at p. 9.

1 **Q. How are the Energy Strong II projects consistent with the purpose of the IIP**
2 **regulation.**

3 A. The IIP regulatory initiative is intended to “provide a rate recovery mechanism that
4 encourages and supports necessary accelerated construction, installation, and rehabilitation of
5 certain utility plants and equipment. ...[S]uch investment would occur in a systematic and
6 sustained way to advance construction, installation, and rehabilitation of utility infrastructure
7 needed for continued system safety, reliability, and resiliency, and sustained economic growth in
8 the State of New Jersey.”⁴ Energy Strong II is poised to build on the success of Energy Strong I
9 by continuing and furthering the Company’s work to enhance the safety, reliability and resiliency
10 of its electric delivery system as consistent with this purpose. In fact, each subprogram has been
11 designed with these goals in mind.

12 The first electric subprogram is a continuation of the Company’s Electric Station Flood
13 Mitigation effort that will provide flood mitigation for an additional 16 stations based on the
14 location of those stations within flood zones as identified by the Federal Emergency
15 Management Agency (“FEMA”) 100-year flood zone, thereby hardening the system and making
16 it more resilient and reliable in the face of severe weather events. This effort will also expand
17 the program work by providing replacements for 15 substation facilities that have been selected
18 based on an asset management risk model to modernize the system and increase its reliability.

19 The second electric effort addresses Outside Plant Higher Design and Construction
20 Standards, which involves upgrading and hardening of approximately 475 circuit miles of the
21 Company’s wires with more resilient materials and configurations that can withstand greater
22 impact to protect against damage from storms—a particular concern of the Board this past year
23 and over the past several years since Superstorm Sandy.

⁴ *IIP Regulation*, at N.J.A.C. 14:3-2A(1)(b).

1 The third electric subprogram is a continuation of the Energy Strong I contingency
2 reconfiguration, designed to redesign, sectionalize, and add redundancy to additional portions of
3 the electric system to allow for greater flexibility and resiliency, allowing for fewer customers
4 being interrupted and increased reliability in the event of an outage.

5 Finally, PSE&G proposes development of an Advanced Distribution Management
6 System to incorporate data received from “smart” sources such as Supervisory Control and Data
7 Acquisition (“SCADA”), intelligent fault indicators, or advanced metering infrastructure
8 (“AMI”) to name a few. This proposal also includes installation of a private wireless
9 communications network for remote communication to both PSE&G and customer equipment
10 and elimination of the old copper wire dedicated phone lines that previously interfaced this
11 equipment. Each of these modernization efforts will serve to increase system reliability and
12 resiliency.

13 In all, the electric portion of Energy Strong II proposes investments that are clearly
14 envisioned by the IIP rule and advance the goal of this regulation. Interestingly enough, neither
15 Messrs. Salamone nor Chang dispute that these programs provide significant benefits. Instead,
16 they rely on claims of procedural deficiency to challenge the Company’s application for IIP
17 approval.

18 **B. Energy Strong II is also consistent with the Board’s recent initiatives.**

19 **Q. Are these proposed electric distribution system investments also consistent with the**
20 **Board’s recent initiatives?**

21 A. Absolutely. In response to the winter weather storms of March 2018—the most severe
22 weather that the area has experienced since Superstorm Sandy—the Board closely examined the
23 storm response and restoration efforts employed by New Jersey electric utilities in the state and
24 identified areas where improvements could be made. Storm preparedness, resiliency and hardening

1 go to the heart of the Board’s concern and goals for the future of NJ’s energy infrastructure. These
2 priorities also form the basis for the second phase of PSE&G’s Energy Strong Program, which
3 include investments to improve system hardening, resiliency and storm response and restoration
4 efforts—including infrastructure upgrades, resilient pole-line infrastructure, and technology
5 automation, among the others listed above.

6 **IV. RESPONSE TO SPECIFIC ISSUES RAISED BY RATE COUNSEL**

7 **A. Rate Counsel’s account of Energy Strong I spending is incorrect.**

8 **Q. Before we get into the specific claims and arguments made by Messrs. Salamone and**
9 **Chang, are there any corrections or clarifications that you would like to make to any**
10 **project information set forth in their testimony?**

11 A. Yes. At page 7 of their testimony, Messrs. Salamone and Chang provide a chart
12 (Schedule 1) that purportedly summarizes the breakdown of spending for the Energy Strong I
13 program as noted below.

Schedule 1 PSE&G Energy Strong I Stipulated and Actual Spending²

Program	Stipulated Amount (millions)	Amount Spent (millions)
Substation Flood Mitigation	\$400	\$422.9
Contingency Reconfiguration	\$100	\$93.6
Advanced Technologies	\$100	\$106.2
Total	\$600	\$622.7

Notes

The Substation Flood Mitigation subtotal excludes the \$220 million of substation investments not part of the Energy Strong I cost recovery mechanism.

14
15 However this chart skews the numbers and seemingly puts the Company over-budget in almost
16 all categories. For the flood mitigation program the stipulated amount shown should be \$620M

1 not \$400M—only \$400M is allowed to flow thru the mechanism but the entire \$620M was the
 2 stipulated amount and should be listed as such. Messrs. Salamone and Chang’s chart also fails to
 3 reflect the reallocation of funds from certain subprograms to others. Lastly, the Contingency
 4 Reconfiguration cost to date is incorrect—it should be \$83.6M of total spend versus the \$93.6M
 5 reflected in Schedule 1.

6 For clarification, the actual Independent Monitor table provided in the discovery response
 7 cited by Messrs. Salamone and Chang is shown below:

Table II-3 – Q2 2018 Energy Strong Program Cost Summary

Sub program	2018 Q2 Spend	2018 Year-to-Date	Sub program to Date	Stipulation Amount	% of Sub program Spent to Date
<i>(in thousands)</i>					
Electric Station Flood Mitigation	\$5,513	\$16,112	\$422,931	\$620,000*	68%
Gas M&R Flood Mitigation	\$73	\$25,357	\$25,357	\$30,000**	85%
UPCI Replacement	\$0	\$370,015	\$370,015	\$370,000**	100%
Advanced Technologies	\$0	\$106,218	\$106,218	\$107,000***	99%
Contingency Reconfiguration	\$1	\$83,615	\$83,615	\$93,000***	90%
Total Energy Strong	\$5,587	\$16,218	\$1,008,136	\$1,220,000*	83%
<p>*.The Stipulation allows PSE&G to invest \$620 million in the Electric Station Flood Mitigation subprogram; however, the Stipulation provides that the amounts beyond the first \$400 million shall be recovered through a traditional rate recovery mechanism rather than through the electric Energy Strong Adjustment Mechanism</p> <p>**In December 2015, \$13.5 million was transferred from the Gas M&R subprogram to the UPCI Replacement subprogram; and in May 2016, an additional \$6.5 million was transferred from the Gas M&R subprogram to the UPCI Replacement subprogram; these figures reflect this reallocation of the respective budgets.</p> <p>***In June 2016, \$5 million was transferred from the Contingency Reconfiguration subprogram to the Advanced Technologies subprogram, and in March 2017, an additional \$2 million was transferred; these figures reflect this reallocation of the respective budgets.</p>					

8
 9 This table clearly indicates that the subprograms were at or below the stipulation amounts and
 10 that the overall electric program was completed below budget. The transfers noted in the table
 11 were all communicated in advance to both the independent monitor and reviewed during
 12 quarterly meetings with the BPU and Rate Counsel.

1 **B. PSE&G’s IIP has satisfied the regulation’s filing requirements.**

2 **Q. In their testimony, at page 20, Messrs. Salamone and Chang indicate that the ESII**
3 **application is deficient and has not provided sufficient information to allow Rate**
4 **Counsel to evaluate the programs. Do you agree?**

5 A. No. PSE&G provided a significant amount of information in its application regarding the
6 program, including cost estimates, a detailed construction sequence, in-service dates (RCR-
7 ENG-E-0012), the number of customers served by each station (Schedule EFG-ESII-4 and
8 Schedule-EFG-ESII-5), overall system demographics on similar stations, and a cost benefit
9 analysis detailing both qualitative and quantitative benefits. Additionally, in determining the
10 infrastructure to be replaced for “life cycle” reasons, PSE&G developed and submitted a risk
11 model related to these stations. The Company has also responded to voluminous discovery
12 requests and conducted a technical conference at which Rate Counsel, Staff, and all intervenors
13 and participants (including their experts) were provided with presentations on each portion of the
14 program, and encouraged to question PSE&G’s subject matter experts. Through this conference,
15 the Program application itself and the discovery process, Rate Counsel has been provided with a
16 significant amount of information related to the program upon which it can evaluate its
17 appropriateness.

18 **Q. According to Messrs. Salamone and Chang, the Company’s ESII Program also**
19 **failed to include detailed engineering reports for the Substations Upgrade, Spacer**
20 **Installation and Sectionalization Subprograms. Do you agree?**

21 A. No. Messrs. Salamone and Chang indicate that the Company submitted a “generalized
22 engineering report” regarding the substation upgrade subprogram. At p. 20 of their testimony,
23 Messrs. Salamone and Chang explain that the problem with the “generalized report” submitted
24 by the Company is that the report “does not address site specific conditions that would be
25 expected in a substation-specific report.” I’m not quite sure what site specific conditions Messrs.
26 Salamone and Chang expected to see in the engineering reports concerning the life cycle

1 stations, as they did not elaborate, but all the stations in this subprogram have a standard design
2 with the only difference being the number of feeders. The engineering report provided represents
3 a construction sequence that can be applied to each station and is the basis for the station reports.

4 On page 20, Messrs. Salamone and Chang go on to comment that the Higher Outside
5 Plant Design Standards and Contingency Reconfiguration subprograms are blanket programs and
6 also lack specific details to allow for proper evaluation. However, as noted previously, a
7 significant amount of information on the individual subprograms was provided as part of the
8 filing, cost benefit analysis, and discovery process. That information included, but was not
9 limited to: identification of the specific circuits where this work is to be performed, the
10 associated mileage, 7 years of circuit level outage history, the basis for estimated benefits,
11 calculations of outage reductions and Value of Lost Load (VoLL) at the circuit level, along with
12 unit cost information. Beyond these specific data points, PSE&G included narratives on the
13 program through testimony, the cost benefit report, and the technical conference. Again, I'm not
14 certain what additional information is needed since Messrs. Salamone and Chang did not
15 elaborate, but PSE&G has complied with all filing requirements and Rate Counsel has been
16 provided with an abundant amount of information and detail on which to comprehensively
17 evaluate the program.

18 C. **Rate Counsel has not properly established the Company's baseline spending**
19 **to be applied in the evaluation of the IIP.**

20 Q. **Do you believe that Rate Counsel's testimony at pages 21-25 accurately reflect**
21 **PSE&G's proposed base capital program.**

22 A. No. On page 24, lines 9-11 the testimony excludes the Energy Strong II type work
23 identified from 2019 to 2023 and thus concludes our proposed plan of \$203 million is now lower
24 than our five year historical electric capital spending of \$223.6 million. This exclusion is not

1 appropriate. PSE&G's capital plan, regardless of Energy Strong II approval, provides for \$233
2 million annually and reflects an increase from the Company's 2012 to 2017 capital spending.

3 **Q. What other observations do you have regarding the testimony on baseline capital**
4 **spending?**

5 A. Schedule 7 at p. 25 of Messrs. Salamone and Chang's testimony accurately reflects our
6 plan with the appropriate baseline spending of \$233M and the Energy Strong proposed spending
7 from 2019 to 2023. I agree that the Energy Strong II program would be approximately 56% of
8 the capital spending from 2019 and 2023 and further reinforces why this represents an
9 incremental, accelerated program to improve system reliability and resiliency.

10 **D. Rate Counsel's cost benefit analysis significantly understates the benefits of**
11 **the Energy Strong II Program.**

12 **Q. Do you agree with Dr. Dismukes that the ESII electric Program should be rejected**
13 **as it is not cost-beneficial?**

14 A. No, I do not. As explained in the rebuttal testimony of the Cost-Benefit Analysis (CBA)
15 panel, Dr. Dismukes alternate cost-benefit analysis significantly understates the benefits of the
16 Program. While Dr. Dismukes and the CBA panel can dispute the assumptions used to calculate
17 the CBA and what benefits should be included to determine whether a program is cost-
18 beneficial, it is important to take a step back and look at the purpose of the program.

19 The Substation subprogram includes raising stations in the flood zone above flood
20 elevation and modernizing stations that, per a risk analysis performed by the Company and
21 submitted in this proceeding, are at or near their end of life. It is hard to imagine anyone arguing
22 against raising and/or modernizing these stations. The only question is (or should be) the
23 timing. The life cycle stations are akin to cast iron main, where the purpose of the program is
24 risk reduction through replacement of cast iron main and not for O&M savings.

1 The Outside Plant Higher Design subprogram is designed to provide resiliency by
2 reducing outages during storms while the Contingency Reconfiguration and Grid Modernization
3 subprograms are designed to provide resiliency by reducing outage duration during major events
4 and modernizing the system. The primary purpose of these subprograms is thus to reduce
5 outages and outage durations, primarily during major storm events. The benefit in outage
6 reduction was quantified in the Company’s CBA using a value of lost load. The table below
7 shows the cost-benefit results under the Company’s CBA and the IMPLAN model used by Dr.
8 Dismukes, but with the Company’s VoLL assumptions.

Subprogram	Company CBA	IMPLAN (Company VoLL) ¹	Notes: ²
Outside Plant Higher Design	2.8	1.6	Even using IMPLAN model used by Dr. Dismukes, an ~40% reduction in the Company's VoLL benefit would still be cost-beneficial
Contingency Reconfiguration	13.0	4.5	Even using IMPLAN model used by Dr. Dismukes, an ~80% reduction in the Company's VoLL benefit would still be cost-beneficial
Grid Modernization	4.6	3.0	Even using IMPLAN model used by Dr. Dismukes, an ~70% reduction in the Company's VoLL benefit would still be cost-beneficial
¹ From worksheet "WP - Company Assumptions" in workpaper "CONFIDENTIAL DED-6, DED-7, and DED-8 Alternative CBA and Reliability Improvements.xlsx" provided in response to PS-RC-1			
² Percentage reduction in VoLL calculated as the reduction in the Output Benefits from worksheet "WP - Company Assumptions" in workpaper "CONFIDENTIAL DED-6, DED-7, and DED-8 Alternative CBA and Reliability Improvements.xlsx" provided in response to PS-RC-1 to equal the Output Benefits in Schedule DED-7			

9

10 The subprograms shown above are still significantly above a 1.0 (benefits are higher than costs)
11 using the IMPLAN model with the Company’s VoLL assumptions. While the appropriate VoLL
12 to be utilized for New Jersey can be debated, it is important to remember that there is clearly a
13 benefit to customers from reducing outages and outage durations. Even with a significant
14 decrease in the Company’s VoLL assumption, these programs would still be cost-beneficial.

1 **Q. At page 30, lines 1-16 of their testimony, Messrs. Salamone and Chang express some**
2 **concerns regarding the cost benefit analysis that was provided; what is your**
3 **reaction to these concerns?**

4 A. I have a few issues with their observations and analysis. First of all, they state that each
5 project must have an individual cost benefit analysis, which is not an IIP requirement under the
6 regulation. The Company has provided project benefits at the circuit level for the Contingency
7 Reconfiguration subprogram and the Higher Outside Plant Design Standards subprogram. In
8 regards to the substation Life Cycle program the analysis performed is based on two alternatives,
9 one scenario in which the stations are replaced over a 20 year horizon, and the Energy Strong II
10 proposal where station replacement is completed in a 5 year program. The benefit calculations
11 are well defined and based on projected equipment failure rates. All the stations are of a similar
12 age and design and by grouping the stations together the analysis provides a more reasonable
13 estimation of benefits.

14 **Q. At page 30, lines 1-3 of their testimony, Messrs. Salamone and Chang state that the**
15 **Flood Mitigation and Substation Upgrade programs are not “cost effective,” what is**
16 **your reaction to this?**

17 A. Rate Counsel’s measure of 1.0 selected to define “cost effective” essentially suggests that
18 until this substation program reaches a 1.0 threshold, these projects should not occur. I have
19 some specific concerns with this approach.

20 In order to meet Rate Counsel’s “cost effective” threshold, the number of substation
21 events would have to increase six fold. This level of equipment failure would be considered
22 unacceptable by any reasonable measure and would have a significant impact on PSE&G
23 customers and PSE&G operating personnel.

24 For customers this translates into a six fold increase in station equipment related outages.
25 From 2014 to 2018, PSE&G averaged approximately 27,000 customer interruptions and 5
26 million minutes interrupted due to 4kV station equipment issues. Applying a multiplier of six

1 would result in 162,000 customer interruptions (representing a 30% failure rate) and
2 approximately 30 million minutes of customer interruption. It will not be until this point,
3 according to the 1.0 cost benefit threshold, that the Company would just be starting the 20 year
4 substation replacement program. The substations completed toward the end of the program
5 would have failure rates approaching an unmanageable and unsafe 80%.

6 **Q. Do such failures only have an effect on customers?**

7 A. No. Such failures not only create reliability and safety issues for customers, but also
8 create safety issues for PSE&G's workers who are required to work in close proximity to
9 maintain and operate this equipment. As failure rates and severity of failure increase, so to do
10 the risks for these Company employees.

11 **Q. What other information do you think is relevant to consider regarding the stations?**

12 A. The proposed "1.0" threshold essentially proposes a capital deferment on station
13 upgrades until the threshold is achieved. This ignores the fact that these stations are all of a
14 significant age (average 62 years Class C and 92 Class A and B), and that there are 95 life cycle
15 stations, including the 11 that are also flood mitigation program stations. The life cycle program
16 is a 20-25 year program at the proposed filing levels. Deferring until a "cost effective" result can
17 be achieved would push most of these stations well beyond their useful lives at which time it
18 would take years to resolve the issues. This is exactly the result PSE&G is trying to avoid
19 through this life cycle program.

20 Substations are essential to delivering electric service to customers. The costs to upgrade
21 these facilities are high due to the equipment required to transform and distribute power to
22 customers. The projects to upgrade these facilities are complex in order to maintain safe and

1 reliable service and require long lead times for planning, engineering, permitting and
2 constructing the facilities.

3 The stations are critical parts of the electric infrastructure and must not be exposed to the
4 risk of floods or left in service beyond their useful lives. The programs proposed were designed
5 using specific data on flood elevations and industry failure curves to avoid significant disruptions
6 to these facilities. By claiming the proposed projects are not “cost effective” implies that raising
7 equipment in a flood zone or implementing a life cycle program is not a prudent use of
8 customer’s money. There is no information presented in the testimony that refutes the flood
9 levels or the increasing risk over time due to aging facilities. Proactively addressing these
10 stations conditions is most definitely in the best interest for customers and is in alignment with
11 the goal of the IIP.

12 **E. Rate Counsel’s claim that the benefits of spacer cable and sectionalization**
13 **sub programs cannot be appropriately captured until after a complete**
14 **trimming cycle has concluded is not true.**

15 **Q. Do you believe that vegetation management can counterbalance the benefits of the**
16 **spacer and increased sectionalization programs?**

17 A. No, I do not. Messrs. Salamone’s and Chang’s testimony significantly overstates the
18 potential benefits of the tree trimming regulations. In 2015, the Board adopted changes to the
19 rules concerning electric distribution vegetation management procedures.⁵ The regulations call
20 for tree trimming to occur on an “inspect and trim where necessary” schedule at least once every
21 four years.⁶ The current rule states that “vegetation management practices shall include removal
22 of all overhanging vegetation from the lock out zone on the distribution circuit.” The lock out
23 zone is defined as the portion of the distribution circuit that begins at the substation and
24 continues to the first protective device. On PSE&G’s 4-kV and 13-kV distribution circuits, the

⁵ N.J.A.C. 14:5-9.8 (b) (1) and (2), effective August 17, 2015.

⁶ N.J.A.C. 14:5-9.4.

1 lock out zone is measured as approximately half the length of the circuit. This means that
2 vegetation management is only performed on 50% of the circuit. More importantly, the
3 regulations provide an exemption for removing all overhanging limbs on “mature trees” within
4 the lockout zone. This provision protects trees and tree canopies within residential communities
5 and limits the mileage that can be fully trimmed to the new regulations.

6 **Q. Are there any other limitations to the vegetation management regulations?**

7 A. Yes. The Company only has the right to trim trees overhanging overhead wires in the
8 right of way. If trees on private property overhang overhead wires, the Company must get
9 permission from the property owner to trim the overhanging trees.

10 **Q. Since the implementation of the 2015 vegetation management regulations, have you**
11 **noticed a decrease in the amount of tree-related outages?**

12 A. No, I’ve actually witnessed a trend in the opposite direction. The table below shows the
13 inclusive and reportable tree outage data from 2015 to 2018. Customer outages in 2015 (the last
14 year of vegetation management under the old regulation) were the lowest as compared to years
15 2016-2018 (the first three years of vegetation management under the current regulation). Of
16 note, the 2016 data as compared to the 2015 customer outage data reveals an outage increase of
17 84%. Examination of the 2018 customer outage data reveals an astounding 200% increase as
18 compared to the outages from 2015. The number of tree-related outages in 2018, 2 years into
19 the vegetation management cycle under the new regulation, was 763,139. This total is higher
20 than 2011 when Hurricane Irene and the October Snowstorm resulted in a total of 712,401 tree-
21 related outages.

1

Schedule 1:

2015-2018 All Inclusive Tree Related Extended Customers and CMI		
Year	Extended Customers	CMI
2015	246,500	68,113,740
2016	408,371	53,803,890
2017	338,935	37,418,386
2018	763,139	273,704,457
2015 - 2018 Reportable Tree Related Extended Customers and CMI		
Year	Extended Customers	CMI
2015	150,580	11,720,203
2016	383,503	49,373,598
2017	276,349	24,905,647
2018	328,588	32,554,498

2

3 **Q. What is your opinion as to why tree related outages have increased since 2015?**

4 A. There is a direct correlation between serious weather events and tree related outages.

5 The tree related outages experienced on the PSE&G system during 2018 represent the 2nd highest

6 total in the last 10 years—with the exception of 2012 when Hurricane Sandy occurred. In March

7 of 2018 two Nor’easters dropped very significant amounts of wet, heavy snowfall in PSE&G’s

8 service territory, wreaking havoc on trees throughout New Jersey, and ultimately on the

9 Company’s overhead wires system. The increases in 2018 were primarily related to these March

10 Nor’easter events, and reflect how much weather severity impacts the number of tree related

11 events.

12 **Q. Is vegetation management sufficient to address the types of serious outages**
13 **experienced increasingly due to severe weather events?**

14 A. Tree trimming alone would have a limited impact in preventing the extended outages

15 experienced during severe weather events. As previously mentioned, the new regulations are

16 limited in scope, and in severe events such as Superstorm Sandy and the March 2018

1 Nor'easters, downed trees and limbs come from both health and unhealthy trees from within and
2 outside the public ROW, many of which would be beyond the scope of the new regulations. Any
3 claim that enhanced vegetation management will significantly improve results is speculative,
4 while the performance of spacer vs. open wire construction are based on actual results from
5 major storm events and will prevent and/or reduce the severity of such outages. The
6 Contingency Reconfiguration subprogram, Higher Outside Plant Design Standards subprogram,
7 and vegetation management efforts are not mutually exclusive. Therefore, waiting for the
8 conclusion of a vegetation management cycle to conclude before considering the spacer cable
9 and sectionalization subprograms is unreasonable.

10 **Q. On page 27, lines 1-5 , Messrs. Salamone and Chang make a statement that if the**
11 **“outage reduction factor gets reduced below a 40%, the subprogram is no longer**
12 **cost effective”. What is your reaction to this claim?**

13 A. Rate Counsel’s defines cost effective by a 1.0 cost benefit ratio. They have calculated that
14 a reduction in tree outages of approximately 34% (40% benefit ratio versus 61% used in the cost
15 benefit analysis) would lead to a 1.0 cost benefit ratio. There is no basis for this level of
16 improvement other than Rate Counsel’s calculation of benefits versus costs. However, when
17 using the model to validate the calculation, reduction in tree outages needs to be closer to 64%
18 (22% benefit vs. 61%) to match approximately a 1.0 ratio. This would be an extreme reduction
19 and would require tree trimming and removals far beyond what the regulations propose.

20 **Q. Does this conclude your rebuttal testimony?**

21 A. Yes it does.