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JOSE R. OLIVA
*Speaker of the House of
Representatives*

May 26, 2020

Adam J. Teitzman, Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Re: Docket No. 20200070-EI – Review of 2020-2029 Storm Protection Plan pursuant to Rule 25-6.030, F.A.C., Gulf Power Company.

Dear Mr. Teitzman:

Please find enclosed for filing in the above referenced docket the Direct Testimony and Exhibits of Kevin J. Mara. This filing is being made via the Florida Public Service Commission's Web Based Electronic Filing portal.

If you have any questions or concerns, please do not hesitate to contact me. Thank you for your assistance in this matter.

Sincerely,

/s/ Thomas A. (Tad) David
Thomas A. (Tad) David
Associate Public Counsel

cc: Parties of Record

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the Direct Testimony and Exhibits of Kevin J. Mara has been furnished to the following parties by electronic mail on this 26th day of May, 2020.

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Sincerely,

/s/ Thomas A. (Tad) David
Thomas A. (Tad) David
Associate Public Counsel

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of 2020-2029 Storm
Protection Plan pursuant to Rule 25-6.030,
F.A.C., Gulf Power Company.

DOCKET NO.: 20200070-EI

FILED: May 26, 2020

DIRECT TESTIMONY

OF

KEVIN J. MARA, P.E.

ON BEHALF OF THE CITIZENS OF THE STATE OF FLORIDA

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DIRECT TESTIMONY

OF

KEVIN J. MARA

On Behalf of the Office of Public Counsel

Before the

Florida Public Service Commission

20200070-EI

1 **I. INTRODUCTION**

2 **Q. WHAT ARE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS?**

3 A. My name is Kevin J. Mara. My business address is 1850 Parkway Place, Suite 800,
4 Marietta, Georgia 30067. I am the Executive Vice President of the firm GDS Associates,
5 Inc. ("GDS") and Principal Engineer for a GDS company doing business as Hi-Line
6 Engineering. I am a registered engineer in Florida and 20 additional states.

7

8 **Q. PLEASE STATE YOUR PROFESSIONAL EXPERIENCE.**

9 A. I received a degree of Bachelor of Science in Electrical Engineering from Georgia Institute
10 of Technology in 1982. Between 1983 and 1988, I worked at Savannah Electric and Power
11 as a distribution engineer designing new services to residential, commercial, and industrial
12 customers. From 1989-1998, I was employed by Southern Engineering Company as a
13 planning engineer providing planning, design, and consulting services for electric
14 cooperatives and publicly-owned electric utilities. In 1998, I, along with a partner, formed
15 a new firm, Hi-Line Associates, which specialized in the design and planning of electric
16 distribution systems. In 2000, Hi-Line Associates became a wholly owned subsidiary of
17 GDS Associates, Inc. and the name of the firm was changed to Hi-Line Engineering, LLC.

1 In 2001, we merged our operations with GDS Associates, Inc., and Hi-Line Engineering
2 became a department within GDS. I serve as the Principal Engineer for Hi-Line
3 Engineering and am Executive Vice President of GDS. I have field experience in the
4 operation, maintenance, and design of transmission and distribution systems. I have
5 performed numerous planning studies for electric cooperatives and municipal systems. I
6 have prepared short circuit models and overcurrent protection schemes for numerous
7 electric utilities. I have also provided general consulting, underground distribution design,
8 and territorial assistance.

9

10 **Q. PLEASE DESCRIBE GDS ASSOCIATES, INC.**

11 A. GDS is an engineering and consulting firm with offices in Marietta, Georgia; Austin,
12 Texas; Auburn, Alabama; Manchester, New Hampshire; Kirkland, Washington; Portland,
13 Oregon; and Madison, Wisconsin. GDS has over 170 employees with backgrounds in
14 engineering, accounting, management, economics, finance, and statistics. GDS provides
15 rate and regulatory consulting services in the electric, natural gas, water, and telephone
16 utility industries. GDS also provides a variety of other services in the electric utility
17 industry including power supply planning, generation support services, financial analysis,
18 load forecasting, and statistical services. Our clients are primarily publicly-owned utilities,
19 municipalities, customers of privately-owned utilities, groups or associations of customers,
20 and government agencies.

21

22 **Q. HAVE YOU TESTIFIED BEFORE ANY REGULATORY COMMISSIONS?**

23 A. I have submitted testimony before the following regulatory bodies:

24 • Vermont Department of Public Service

- 1 • Federal Energy Regulatory Commission ("FERC")
2 • District of Columbia Public Service Commission
3 • Public Utility Commission of Texas
4 • Maryland Public Service Commission
5 • Corporation Commission of Oklahoma

6 I have also submitted expert opinion reports before United States District Courts in
7 California, South Carolina, and Alabama.

8

9 **Q. HAVE YOU PREPARED AN EXHIBIT DESCRIBING YOUR QUALIFICATIONS**
10 **AND EXPERIENCE?**

11 A. Yes. I have attached Exhibit KJM-1, which is a summary of my regulatory experience and
12 qualifications.

13

14 **Q. ON WHOSE BEHALF ARE YOU APPEARING?**

15 A. GDS was retained by the Florida Office of Public Counsel ("OPC") to review Gulf Power's
16 ("Gulf" or "Company") proposed 2020-2029 Storm Protection Plan ("SPP") on behalf of
17 the OPC. Accordingly, I am appearing on behalf of the Citizens of the State of Florida.

18

19 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

20 A. I am presenting my expert opinion regarding issues raised in Gulf's proposed 2020-2029
21 Storm Protection Plan.

22

23 **Q. WHAT INFORMATION DID YOU REVIEW IN PREPARATION OF YOUR**
24 **TESTIMONY?**

1 A. I reviewed the Company's filing, including the direct testimony and exhibits. I also
2 reviewed the Company's responses to OPC's discovery, the Company's responses to the
3 Florida Public Service Commission ("PSC" or "Commission") Staff's discovery, and other
4 materials pertaining to the SPP and its impacts on the Company. In addition, I reviewed
5 section 366.96, Florida Statutes, which requires the filing of the SPP and authorized the
6 Commission to adopt the relevant rules, including rule 25-6.030, Florida Administrative
7 Code ("F.A.C."), which addresses the Commission's approval of a Transmission and
8 Distribution SPP covering a utility's immediate 10-year planning period.

9

10 **Q. PLEASE DESCRIBE HOW THE REMAINDER OF YOUR TESTIMONY IS**
11 **ORGANIZED.**

12 A. I first discuss the purpose of storm hardening and an SPP as informed by rule 25-6.030
13 F.A.C., including the concept of "resiliency," and I distinguish the concepts of "resiliency"
14 and "reliability." I then discuss the critical role quantifiable benefits play in the analysis
15 and review of an SPP. Finally, I discuss my analysis of the new programs proposed in the
16 SPP, including principles that should be applied when reviewing Gulf's proposed SPP. In
17 the discussion of the principles I applied, I include criteria that, in my expert opinion, the
18 Commission must weigh to properly evaluate the sufficiency of the SPP and each SPP
19 program under the statutes and rules governing the SPPs.

20

21 **II. THE PURPOSE OF STORM HARDENING**

22 **Q. PLEASE DISCUSS FLORIDA SENATE BILL 796 (2019), AND THE RESULTING**
23 **SECTION 366.96, FLORIDA STATUTES, FROM YOUR PERSPECTIVE AS AN**
24 **ELECTRIC UTILITY DISTRIBUTION ENGINEER.**

1 A. As the Commission is aware, in 2019 the Florida Legislature passed Senate Bill 796
2 regarding Storm Protection Plan and Storm Protection Plan Cost Recovery and the
3 Governor signed the bill on June 27, 2019. Section 366.96, Florida Statutes, resulted. The
4 purpose of storm hardening is stated as follows: “Protecting and strengthening transmission
5 and distribution electric utility infrastructure from extreme weather conditions can
6 effectively reduce restoration costs and outage times to customers and improve overall
7 service reliability for customers.”¹ Further, the statute states, “All customers benefit from
8 the reduced costs of storm restoration.”²

9 The Florida Legislature directed the Commission to consider “the estimated costs and
10 benefits to the utility and its customers of making the improvements proposed in the
11 [SPP].”³

12 All of the SPPs should be based on the premise that, by investing in storm hardening
13 activities, the electric utility infrastructure will be more resilient to the effects of extreme
14 weather events. This resiliency should result in lower costs for restoration from the storms
15 and reduced outage times experienced by the customers. In my opinion, clearly, the goal
16 is to invest in storm hardening activities that benefit the customers of the electric utilities
17 at a cost that is reasonable relative to those benefits.

18

19 **Q. PURSUANT TO SECTION 366.96, FLORIDA STATUTES, THE COMMISSION**
20 **ADOPTED RULE 25-6.030, F.A.C. PLEASE DISCUSS RULE 25-6.030 F.A.C.,**
21 **FROM YOUR PERSPECTIVE AS AN ELECTRIC UTILITY DISTRIBUTION**
22 **ENGINEER.**

¹ Section 366.96(1)(d), Fla. Stat. (2019).

² Section 366.96(1)(f), Fla. Stat. (2019).

³ Section 366.96(4)(c), Fla. Stat. (2019).

1 A. Rule 25-6.030, F.A.C., mandates that after its initial SPP, each utility must file an updated
2 SPP at least every three years that covers the utility's immediate ten-year planning period.
3 This language is significant and central to a recommendation that I make later in my
4 testimony. The definitions in rule 25-6.030, F.A.C., help define the purpose and operation
5 of the rule and statute. Per the rule, a storm protection *program* is a group of storm
6 protection projects that are undertaken to enhance the utility's existing infrastructure for
7 "the purpose of reducing restoration costs and reducing outage times associated with
8 extreme weather conditions."⁴ Further a storm protection *project* is defined as a specific
9 activity designed for enhancement of the system "for the purpose of reducing restoration
10 costs and reducing outage times associated with extreme weather conditions."⁵

11 The utility is required to provide, within the SPP, a description of how implementation of
12 the projects will reduce restoration costs and outage times associated with extreme weather.
13 Specifically, for each proposed storm protection program, the utility is to provide "an
14 estimate of the resulting reduction in outage times and restoration costs due to extreme
15 weather conditions."⁶

16 Rule 25-6.030, F.A.C., requires utilities to provide budgets for projects and to provide the
17 estimated reduction in restoration costs. These amounts must be balanced against the
18 benefits to the utilities' customers. Further, the two amounts will allow the Commission
19 and stakeholders to understand the benefits of the capital investments for storm hardening.
20 Any project can claim to reduce outage time/cost, but the project must be cost effective for
21 customers to benefit. To summarize, without giving consideration to benefits achieved for

⁴ Rule 25-6.030 (2)(a), F.A.C.

⁵ Rule 25-6.030 (2)(b), F.A.C.

⁶ Rule 25-6.030 (3)(d)(1), F.A.C.

1 the projects, there will be no limit on expenditures for the storm protection plan, which is
2 not contemplated by the SPP rule or statute.

3

4 **Q. HOW IS RULE 25-6.030, F.A.C., DIFFERENT FROM THE REQUIREMENTS OF**
5 **RULE 25-6.0342, F.A.C.?**

6 A. Pursuant to now repealed rule 25-6.0342, F.A.C., a utility was required to estimate “the
7 costs and benefits to the utility of making the electric infrastructure improvements,
8 including the effect on reducing storm restoration costs and customer outages.”⁷
9 Previously, benefits were the effect on reducing storm restoration costs, while the current
10 rule (Rule 25-6.030) now requires an estimate of the reduction of the storm restoration time
11 and a comparison of the estimated cost of the program and resulting benefit.⁸

12

13 **Q. ARE THE COSTS ASSOCIATED WITH THE SPP BEING PROPOSED TO**
14 **ADDRESS SYSTEM RELIABILITY OR SYSTEM RESILIENCY?**

15 A. They should address both concepts to some extent. To begin, it is fundamental that electric
16 utilities have a duty to provide safe, reliable, and affordable electric service. This duty for
17 reliable service does not mean 100% reliability, but reliability is a core function of an
18 electric utility. Many jurisdictions, including Florida, require utilities to report on system
19 reliability. Reliability indices include System Average Interruption Frequency Index
20 (“SAIDI”), System Average Interruption Frequency Index (“SAIFI”), and Customer
21 Average Interruption Duration Index (“CAIDI”), which are defined in Institute of
22 Electrical and Electronics Engineers (“IEEE”) Standard 1366 - *IEEE Guide for Electric*

⁷ Rule 25-6.0342 (4)(d), F.A.C., (repealed effective June 2, 2020).

⁸ Rule 25-6.030 (3)(d)(1) and (3)(d)(4), F.A.C.

1 *Power Distribution Reliability Indices*. Comparison of these indices is normally done
2 excluding major event days, which are also referred to as Major Service Outages.

3 On the other hand, resiliency focuses on the ability of an electric utility system to withstand
4 and reduce the magnitude and/or duration of disruptive events.⁹

5 One way to consider the difference of reliability and resiliency is to compare common
6 characteristics:¹⁰

7 Reliability: Routine, not unexpected, normally localized, shorter duration
8 interruptions of electric service.

9 Resiliency: Infrequent, often unexpected, widespread/long duration power
10 interruptions, generally with significant corollary impacts.

11 Because rule 25-6.030, F.A.C., references “extreme weather conditions” throughout its
12 provisions, the projects contained in the SPP should be primarily focused on resiliency and
13 not reliability. However, even though the primary focus should be on resiliency, the
14 benefits from reliability cannot and should not be ignored.

15

16 **Q. WHY IS IT IMPORTANT TO DISTINGUISH BETWEEN RESILIENCY AND**
17 **RELIABILITY IN EVALUATING UTILITY-PROPOSED SPP INVESTMENTS?**

18 A. The amount of capital investment utilities proposes to invest is increasing, as indicated by
19 the SPP proposals filed by Gulf and the other Florida electric utilities. With these increasing
20 investments come bigger risks for the customers ultimately paying the costs. It will,
21 therefore, be important to develop standards to evaluate whether the SPP proposals being
22 made by Gulf and the other Florida electric utilities are cost justified. Standards will be

⁹ FERC Docket RM18-1-000 Grid Reliability and Resilience Pricing

¹⁰ *Metrics for Resilience in Theory and in Practice*, Joseph Eto, Lawrence Berkeley National Laboratory, 05/22/18.

1 needed to evaluate the value and cost-effectiveness of the proposed SPP programs and how
2 they differ from traditional reliability investments that would be included and recovered in
3 traditional utility base rates. Using traditional *reliability* measures to fully evaluate
4 proposed system hardening expenditures to improve resiliency may not be adequate. As
5 noted above, resilience and reliability are distinguishable concepts, and the expenditures to
6 address improvements in each may require their own specialized evaluation criteria. There
7 is not yet a clear and widely accepted "value of resilience" metric, so appropriate evaluation
8 standards need to be developed by the Commission to determine the adequacy of the
9 proposed SPPs. Moreover, while traditional measurements of reliability have been in use
10 for many years and are widely accepted, there are not yet standardized or widely accepted
11 standards for measuring resiliency, measurements for reliability related to resiliency, or
12 methods of determining the value of system hardening expenditures intended to improve
13 resiliency. Without such criteria for evaluating costs, expenditures may be undertaken by
14 a utility for SPP programs that may not produce or result in adequate benefits related to the
15 costs of the proposed initiatives.

16
17 **Q. ARE YOU AWARE OF CLEAR STANDARDS USED IN THE ELECTRIC**
18 **INDUSTRY TO MEASURE SYSTEM RESILIENCY?**

19 A. The electric utility industry has clearly defined standards to measure system reliability
20 using SAID, SAIFI, and CAIDI as referenced above. However, the industry does not have
21 mature or clearly defined standards for measuring resiliency.

22
23 **Q. WHAT ARE SOME METHODS FOR MEASURING SYSTEM RESILIENCY?**

1 A. To define metrics for resiliency, it is important to consider the purpose of resiliency.
 2 Energy distribution systems provide energy for the benefit of the community in the form
 3 of transportation, health care, economic gains, etc. The goal of improving energy system
 4 resiliency is to make communities safer and more productive. Major weather events can
 5 cause widespread electric outages resulting in damage to the community and to the
 6 individual customers.

7 Thus, resiliency metrics should include the impact to customers and the community.¹¹ The
 8 following table contains suggested resiliency metrics:

Electric Service	Cumulative customer-hours of outage from extreme weather events
Critical Electric Service	Cumulative critical customer-hours of outage from extreme weather events
Restoration	Time to recover to 50% of peak number of customers out Time to recover to 75% of peak number customers out Time to recover to 100% of peak number of customers out
Monetary	Cost of Recovery Cost of grid damages
Community Function	Critical services without power more than N hours where N is less than hours of back up fuel.

9 The restoration time to 50% of peak is a measurement of the speed of restoration and a key
 10 component of resiliency. Generally, the 50% value is an indication of the resiliency of the
 11 transmission and substation facilities.

12 Critical Electric Service represents those critical customer-hours not served by the utility.
 13 A more resilient system would help prevent or minimize the outages and, if outages did
 14 occur, to restore the system more quickly. Community Function measures the impact to a

¹¹ See *Resilience Metrics for the Electric Power System: A Performance-Based Approach*, Sandia National Laboratories February 2017.

1 community and is based on the hours of outage time any critical public infrastructure (*E.g.*
2 – first responder facilities, hospitals, critical community loads) is without utility power over
3 N hours. Critical public infrastructure will often have backup generators with fuel supplies
4 for 48 to 96 hours depending on building code requirements. N represents the number of
5 hours for which the facility has backup fuel supplies. Thus, it is important that power is
6 restored to these customers prior to their depletion of the fuel supply for the backup
7 generator. So, N could be defined as 48 hours. The goal would be for the Community
8 Function to have very few hours of outage time beyond their fuel supply hours. Critical
9 Electric Service is a function of the total hours these critical public infrastructure customers
10 are without utility power and relying instead on their backup power systems.

11 I recommend the Commission consider these resiliency metrics to track the effectiveness
12 of SPP projects in future events. Limits for these parameters can help define the scope of
13 SPP projects and may influence the speed of the roll-out of the projects.

14 15 **III. BENEFITS OF SPP PROGRAMS**

16 **Q. YOU STATED THAT A COMPARISON OF THE ESTIMATED COST OF THE**
17 **PROGRAM AND RESULTING BENEFIT IS REQUIRED BY RULE 25-6.030,**
18 **F.A.C. DID GULF POWER INCLUDE QUANTIFIED BENEFITS FOR SPECIFIC**
19 **PROPOSED PROJECTS OR FOR THE ENTIRE SPP?**

20 **A.** No. Gulf did not provide any quantifiable benefits for any project nor did Gulf provide
21 projected savings for its proposed SPP as a whole.

22
23 **Q. WHAT INFORMATION DID GULF POWER PROVIDE REGARDING**
24 **BENEFITS?**

1 A. Section II of Gulf’s Storm Protection Plan 2020-2029, is titled “2020-2029 SPP Will
 2 Strengthen Gulf’s Infrastructure to Withstand Extreme Weather Conditions and Will
 3 Reduce Restoration Costs and Outage Times;” however, it contains no specific language
 4 regarding reduction in costs or reduction in outage time.

5 For each initiative Gulf includes a section on “benefits,” I have summarized Gulf’s
 6 responses regarding benefits for those initiatives in the following table:

Initiative	Gulf Power’s Perceived Benefits Summarized	Quantified Cost Savings or Reduction in Outage time
Distribution Pole Inspection Program	Investments in storm hardening could reduce the extent of outages as well as restoration times from future storm events. ¹²	None Provided
Distribution Feeder Hardening	Improving the storm resiliency of distribution feeders provides immediate benefits for every customer served off a hardened feeder as soon as the hardening is completed. ¹³	None Provided
Lateral Undergrounding Program	Based on the overall performance of underground vs. overhead facilities and the extensive damage to Gulf’s overhead facilities caused by vegetation, this program will further expand the benefits of hardening throughout Gulf’s distribution system (i.e., reduced outages and restoration time). ¹⁴	None Provided
Transmission Hardening	Steel and Concrete out-performed wood structures. Gulf will continue its program of replacing transmission wood structures with steel or concrete to ensure the resiliency of its transmission structures. ¹⁵	None Provided

¹² See Exhibit MS-1, p. 8.

¹³ *Id.* p. 17.

¹⁴ *Id.* p. 21.

¹⁵ *Id.* p. 24.

1 As evident in this table, Gulf Power did not quantify any reduction in outage time or
2 savings in terms of costs for its customers. This lack of specific benefits means that any
3 project, no matter how high the cost, could be justified by simply claiming it reduced or
4 will reduce outages and restoration time. To satisfy the requirements of the SPP statute and
5 rule, Gulf must estimate and quantify the benefits so that comparison to the costs can be
6 made by the Commission.

7

8 **Q. CAN YOU PROVIDE AN EXAMPLE OF HOW THE BENEFITS COULD BE**
9 **ESTIMATED?**

10 A. Yes. For example, Gulf's Transmission Hardening Program is focused on the replacement
11 of wood transmission poles with steel or concrete poles. Roughly 38% of transmission
12 poles on Gulf Power's system are wood poles which is approximately 4,600 poles.¹⁶ The
13 budget to replace a wood transmission pole with a steel or concrete pole is \$50,000 per
14 pole.¹⁷ However, the estimated cost to replace a wood transmission pole during restoration
15 efforts after an extreme weather event is \$140,000.¹⁸ Analysis from Hurricane Michael
16 showed that 336 wood poles failed which is an 8.4% failure rate, whereas the failure rate
17 of steel and concrete poles was 0.3%. This simple analysis demonstrates the benefit in
18 terms of costs for storm restoration and compares that savings to the implementation costs.
19 This type of analysis allows the Commission and stakeholders to clearly understand the
20 value of Gulf's Transmission Pole Hardening Program and should be required by the
21 Commission for every program proposed by Gulf.

¹⁶ *Id.* p. 23.

¹⁷ *Id.* Appendix C, p. 9.

¹⁸ Gulf's Response to OPC's Fifth Set of Interrogatories, No. 206.

1 **Q. REGARDING THE FEEDER HARDENING PROGRAM THAT GULF POWER**
2 **HAS BEEN WORKING ON SINCE 2006, DID GULF PROVIDE ANY**
3 **QUANTIFIABLE BENEFITS?**

4 A. No, there are no quantifiable benefits reported in the SPP. Gulf initiated its feeder
5 hardening initiative in 2006 and by 2019 had completed hardening on 269 feeders.¹⁹ The
6 Forensics Analysis performed following Hurricane Michael collected a sampling of system
7 assets and storm damage to perform a statistical analysis.²⁰ However, the analysis, which
8 leveraged Gulf's GIS database, did not demonstrate the effectiveness of the distribution
9 feeder hardening program. Such a demonstration potentially could have provided more
10 justification for Gulf's change in the design parameters of the program to now include
11 extreme wind loading ("EWL") criteria on feeder poles which was not the case prior to
12 2019.²¹

13 Without quantifiable benefits, the Commission does not have a basis to evaluate the new
14 EWL inclusion in Feeder Hardening (or any similarly inadequately justified program)
15 pursuant to the standards set out in the statute.

16
17 **Q. WHAT IS YOUR RECOMMENDATION REGARDING GULF POWER'S**
18 **PROPOSED SPP PROGRAMS?**

19 A. In my expert opinion, the Commission should reject each program that lacks quantifiable
20 data demonstrating the benefits of the programs. From my review of the Company's
21 answers to interrogatories and responses to the requested production of documents, it
22 appears that Gulf may possess quantifiable data regarding benefits for most of its proposed

¹⁹ See Exhibit MS-1, p. 18.

²⁰ *Id.* Appendix B Section 1.2, p. 7.

²¹ Direct Testimony of Michael Spoor, p. 9, lines 20-23.

1 initiatives. It is Gulf's responsibility to submit this type of information to support its SPP.
2 Since Gulf has not submitted this type information, the Commission does not have enough
3 information to evaluate the sufficiency of the SPP on this program, pursuant to the
4 standards provided in the statute and rule, and therefore, the Commission should not
5 approve it.

6

7 **Q. SHOULD THE COMMISSION CONSIDER POTENTIAL ECONOMIC IMPACTS**
8 **OF THE COVID-19 PANDEMIC IN DECIDING WHETHER GULF'S PROPOSED**
9 **\$998.8 MILLION SPP SHOULD GO FORWARD AT THIS TIME?**

10 A. Yes. The uncertainty of the economic impacts of COVID-19 on the Florida economy
11 should be considered by the Commission in reviewing Gulf's SPP. Florida's economy has
12 been hit hard by the pandemic and has experienced a significant increase in unemployment.
13 Section 366.96, Florida Statutes, directs the Commission to consider the estimated annual
14 rate impact resulting from implementation of the Plan during the first three years.²² In the
15 first three-year period of the SPP, Gulf budgeted \$247.9 million in various programs.²³ In
16 determining, the rate impact of this investment, the Commission needs to consider the state
17 of the economy and the affordability of electric service where there are uncertainties
18 associated with the economic impact from the COVID-19 pandemic. Because we are still
19 in the middle of the pandemic and do not know the full impact to the Florida and national
20 economy or when the pandemic may end, I recommend the Commission direct Gulf to re-
21 file or file an update to its plan in 2022 to consider the impacts of the pandemic and the
22 effects to Florida citizens and businesses. If Gulf was required to update the SPP in 2022

²² Florida Statutes, Section 366.96(4)(d).

²³ See Gulf Response to OPC Second Request for Production of Documents, No. 15.

1 after the conclusion of the 2021 rate case, it would not be unreasonable for the Commission
2 to allow Gulf to implement and submit for prudence determinations the core programs of
3 the SPP including

- 4 • Distribution mainline feeder patrol program,
- 5 • Distribution – Pole Inspections,
- 6 • Transmission – Inspections,
- 7 • Distribution – Vegetation Management, and
- 8 • Transmission – Vegetation Management.

9 These programs have been developed and in use for many years as part of Gulf’s approved
10 SHP and the three-year total expenditure is \$44.13 million. Accordingly, I would not find
11 it unreasonable if the Commission approves the SPP with the modification that allowed the
12 core programs to go forward and ordered a delay in implementing the other hardening
13 programs until Gulf can provide the rate impact of all programs updated with the economic
14 impact of the COVID-19 pandemic.

15

16 **IV. NEW SPP INITIATIVES**

17 **Q. HAS GULF POWER OFFERED ANY NEW INITIATIVES IN THE SPP?**

18 A. Yes. Gulf has offered several new initiatives that were not in Gulf’s 2019 Storm Hardening
19 Plan (“SHP”) approved by the Commission on July 29, 2019.²⁴ These new initiatives are
20 as follows;

- 21 • Lateral Undergrounding Program
- 22 • Substation Flood Monitoring and Hardening, and
- 23 • Transmission and Substation Resiliency Program.

²⁴ Docket No. 20180147-EI, Order No. PSC-2019-0311-PAA-EI (July 29, 2019).

1 **Q. CAN YOU DESCRIBE THE LATERAL UNDERGROUNDING INITIATIVE?**

2 A. Yes. Gulf is proposing a new lateral undergrounding program which is intended to protect
3 certain overhead laterals during extreme weather events by converting the laterals to
4 underground. Gulf's laterals are located on smaller roads, in neighborhoods, and in other
5 areas that can create access issues.²⁵ Gulf also stated the program is built upon the
6 experiences of Florida Power & Light Company ("FPL"), but Gulf's laterals are different
7 from FPL's laterals, because FPL often builds laterals behind homes which are not
8 accessible to trucks. Without adequate access, FPL's repair times are significantly longer
9 compared to Gulf's repair times.

10

11 **Q. GULF POWER HAS APPROXIMATELY 7,000 LATERALS WHICH**
12 **REPRESENTS 5,063 MILES OF OVERHEAD LINES.²⁶ IN ITS SPP, DID GULF**
13 **POWER INCLUDE THE METHODOLOGY IT USED TO SELECT AND**
14 **PRIORITIZE PROPOSED STORM PROTECTION PROJECTS INCLUDING**
15 **THE LATERAL UNDERGROUNDING?**

16 A. No. Gulf does not meet the requirement set forth in rule 25-6.030 (3)(e)(1)(d), F.A.C.²⁷
17 Gulf's SPP provided only very vague criteria that begin with overall feeder performance
18 and customer density. Gulf states that priority will be given to laterals impacted by recent
19 storms and based upon the lateral's history of vegetation-related outages. However, Gulf
20 also stated the program is built upon the experiences of FPL. I understand that FPL intends
21 to underground all laterals on a feeder. Therefore, if Gulf follows FPL's lead, the

²⁵ See Exhibit MS-1, pp. 20-21.

²⁶ *Id.* p. 20.

²⁷ FAC 25-6.030 (3)(e)(1)(d). See "a description of the criteria used to select and prioritize proposed storm protection projects."

1 performance of a lateral is not truly a consideration for prioritizing undergrounding
2 activities. The only parameter for prioritizing feeders that Gulf offers is the feeder's overall
3 performance with no clearly stated definition of overall performance.

4 In my opinion, it is not cost effective to underground all laterals, especially if the lateral is
5 along a road or other thoroughfare with easy access for line crews. Gulf must provide its
6 justification for prioritizing laterals, subject to discovery, expert review, and testimony,
7 before the Commission should consider whether to approve, deny, or approve the program
8 with modifications.

9

10 **Q. HAS GULF POWER MADE A COMPARISON OF THE COSTS AND BENEFITS**
11 **OF LATERAL UNDERGROUNDING?**

12 A. No. Gulf admits that the Lateral Undergrounding Program is new and the first year is
13 designed to help it learn best methods. Costs for undergrounding have been provided for
14 the first year but only vague notions of the performance of underground versus overhead
15 facilities during Hurricane Michael were presented.²⁸ I note that FPL's data show that the
16 average cost to restore power to a lateral was \$44,880 per lateral,²⁹ but the cost to
17 underground a single lateral for FPL is \$755,778.³⁰ Gulf just experienced a devastating
18 hurricane in 2018; thus, it is conceivable that Gulf would have data for the cost of lateral
19 repairs and the times to restore these laterals. This data would help the Commission to
20 determine the benefit in reducing costs to restore laterals as well as the benefit from a
21 reduction in outage time, which is necessary to properly evaluate whether this initiative

²⁸ See Exhibit MS-1, p. 21.

²⁹ See Exhibit MJ-1, Florida Power & Light Company Storm Protection Plan 2020-2029, Appendix A. Average Construction ManHour (CMH) to restore a lateral is 43.7 for Hurricane Michael and Irma. Cost per CMH is \$1027 for Irma per Exhibit MS-1, P. 4

³⁰ *Id.* Appendix C.

1 should be approved by the Commission. This data, to the extent it was available prior to
2 submission of testimony, should have been provided for analyze as part of my direct
3 testimony.

4

5 **Q. WHAT IS YOUR RECOMMENDATION REGARDING LATERAL**
6 **UNDERGROUNDING?**

7 A. In my opinion, since Gulf's prioritization scheme for lateral undergrounding is not clearly
8 defined, this project should not be included in the SPP until such time as Gulf can provide
9 the information discussed above. Further, benefits and costs need a critical comparison to
10 determine if customers are receiving adequate benefits for the higher rates due to this
11 program. Without such data, the Commission does not have enough information to evaluate
12 the sufficiency of this program within the SPP in order to meet the statutory requirement
13 to either approve, deny or approve it with modifications. Therefore, in my expert opinion
14 and according to the statute and rules, it should be denied.

15

16 **Q. CAN YOU DESCRIBE THE SUBSTATION FLOOD MONITORING AND**
17 **HARDENING INITIATIVE?**

18 A. Yes. After Hurricane Michael, Gulf Power initiated a program to re-evaluate substations
19 using the Coastal Substation Risk Assessments. This assessment is designed to identify
20 substations threatened by flooding and/or storm surges. This assessment also considered
21 the strength of the switch house, which houses the electronic relays, controls, and SCADA
22 communication hardware, to withstand hurricane force winds.

23 Based on this assessment, which is essentially used to prioritize the projects, Gulf plans to
24 implement flood monitoring on vulnerable substations and review switch house

1 construction standards.³¹ The initial projects include flood monitoring at six substations at
2 an approximate cost of \$20,000 per substation. In addition, Gulf is planning to storm
3 harden three switch houses at a cost of approximately \$300,000 per control house.³²

4

5 **Q. HAS GULF POWER MADE A COMPARISON OF THE COSTS AND BENEFITS**
6 **FOR THE SUBSTATION FLOOD MONITORING AND HARDENING**
7 **INITIATIVE?**

8 A. No. Gulf's only stated benefit from flood monitoring is the ability to proactively de-
9 energize those substations susceptible to flooding to reduce damage to powered substation
10 equipment.³³ There is no mention of benefits from the hardening of the switch houses.
11 Gulf has not sustained any damage from flood waters in substations in the last five years.³⁴
12 Although, during Hurricane Michael, one switch house suffered wind damage which cost
13 \$753,501 to replace and 14 other switch houses had minor repairs.³⁵

14

15 **Q. WHAT IS YOUR RECOMMENDATION REGARDING SUBSTATION FLOOD**
16 **MONITORING AND HARDENING INITIATIVE?**

17 A. In my opinion, Gulf has not shown a quantifiable benefit for flood monitoring since there
18 have been no damages. The switch house hardening for only three substations exceeds the
19 cost of any extreme storm damage sustained over the last five years. However, because the
20 loss of a switch house puts the substation out of service, this type of project could be
21 justified, but only if Gulf defines the cost savings or reduction in restoration time in the

³¹ See Exhibit MS-1, p.23.

³² *Id.* Appendix C p. 9.

³³ *Id.* pp. 24-25.

³⁴ Gulf's Response to OPC's Fourth Set of Interrogatories, No. 161.

³⁵ Gulf's Response to OPC's Fourth Set of Interrogatories, No. 162.

1 event a switch house structure fails. Gulf has failed to provide that quantifiable benefit.
2 Without such data, the Commission does not have enough information to evaluate the
3 sufficiency of this program within the SPP in order to meet the statutory requirement to
4 either approve, deny or approve it with modifications. The proposed Substation Flood
5 Monitoring and Hardening initiative should, therefore, be denied.

6

7 **Q. CAN YOU SUMMARIZE YOUR UNDERSTANDING OF GULF'S**
8 **TRANSMISSION AND SUBSTATION RESILIENCY PROGRAM?**

9 A. Yes. This program is designed to invest in the overall strengthening of the electric grid at
10 the transmission and substation level to remove critical single points of failure that have
11 the potential to impact a large number of customers.³⁶ An example of a single point of
12 failure would be a substation with a single power transformer. If the transformer fails
13 (single point of failure), customers served through the substation would be without power.
14 A common solution is to install a redundant transformer in the substation. Another
15 example of a single point of failure, is a radial transmission line that serves one or two
16 substations. If the transmission line fails, both substations will be without of power and so
17 will the customers served by these substations. A second transmission feed creating a loop
18 will solve this single point of failure.

19 Gulf provided no information for projects for year two and year three in its plan; therefore,
20 it is not possible to describe exactly how Gulf will solve these single point of failures in
21 future years.

³⁶ Direct Testimony of Michael Spoor, p. 12, lines 4-8.

1 **Q. DID GULF POWER INCLUDE A METHODOLOGY FOR PRIORITIZING THE**
2 **TRANSMISSION AND SUBSTATION RESILIENCY PROGRAM?**

3 A. No. Gulf simply stated, “based on customer impact and prioritization, Gulf is engaged in
4 the process of removing single points of failure.”³⁷ When OPC inquired as to whether or
5 not there was in fact a priority method being employed, Gulf responded that all
6 prioritization for the single point of failure program is in the SPP.³⁸ Based on the customer
7 impact and prioritization contained in the SPP there is not sufficient information for the
8 Commission and stakeholders to understand the purpose or priority of a program slated to
9 spend \$49,720,000.³⁹ Without such information, the Commission does not have enough
10 information to evaluate the sufficiency of this program within the SPP in order to meet the
11 statutory requirement to either approve, deny, or approve it with modifications. The
12 proposed Transmission and Substation Resiliency Program should therefore be denied.

13
14 **Q. HAS GULF POWER MADE A COMPARISON OF THE COSTS AND BENEFITS**
15 **FOR THE TRANSMISSION AND SUBSTATION RESILIENCY PROGRAM?**

16 A. No. Gulf has only provided vague statements such as “removing single points of failure is
17 to provide redundancy in single transformer substations and to provide additional feeds
18 and/or equipment to improve storm resiliency.”⁴⁰ Before adding a second transformer to a
19 substation, an analysis of the distribution system to withstand an N-1 contingency⁴¹ should
20 be made. Since this is extreme weather event resiliency, this analysis should be conducted
21 at some load values less than peak loads. If the existing distribution system has

³⁷ See Exhibit MS-1, p. 24.

³⁸ Gulf’s response to OPC’s Fourth Set of Interrogatories, No.166.

³⁹ See Exhibit MS-1, Appendix C, p. 9.

⁴⁰ *Id.* p. 25.

⁴¹ N-1 is defined as no single failure of a piece of equipment should cause customers to lose power. In this case, the loss of a transformer in a substation.

1 redundancy—and many urban substations will have redundancy—there is no need for a
2 second transformer. There is no evidence that such an analysis was made by Gulf or if the
3 analysis is part of any prioritization for these investments.

4 Another possible solution to consider is the use of a mobile substation which is designed
5 exactly for a single point of failure. During Hurricane Michael, Gulf had one single point
6 of failure event during the hurricane, which required the utilization of a mobile substation.
7 Further, Gulf implies that there will be new transmission lines to provide backfeeding to
8 some unidentified substations. The justification for redundant transmission feeds needs
9 close scrutiny by the Commission. Transmission loops that benefit multiple substations
10 should have a higher priority than a loop for a single substation. There is no evidence that
11 this type of analysis was performed by Gulf to determine a priority for this high cost
12 program. Without this analysis, the Commission does not have enough information to
13 evaluate the sufficiency of this program within the SPP in order to meet the statutory
14 requirement to either approve, deny or approve it with modifications. This is a further
15 reason why the proposed Transmission and Substation Resiliency Program should be
16 denied.

17
18 **Q. WHAT IS YOUR RECOMMENDATION REGARDING THE TRANSMISSION**
19 **AND SUBSTATION RESILIENCY PROGRAM?**

20 A. In my opinion, Gulf has not shown in sufficient detail that there is a benefit for a program
21 initiated due to a single transformer failure that occurred during Hurricane Michael which
22 was alleviated by a mobile substation. Gulf failed to provide a prioritization method for
23 this program. As a result, the Commission does not have enough information to evaluate
24 the sufficiency of this program within the SPP in order to meet the statutory requirement

1 to either approve, deny, or approve it with modifications, and therefore, in my expert
2 opinion, should not approve it.

3

4 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.**

5 A. In its proposed SPP, Gulf has failed to provide benefits for programs as required by rule
6 25-6.030, F.A.C., in a format that allows a meaningful comparison of the benefits to the
7 costs of the projects or programs. The requirements regarding storm hardening activities
8 have changed with the advent of the SPP statute and rules. Rule 25-6.030, F.A.C., clearly
9 requires some quantitative comparison of benefits and costs. Without some means of
10 comparison, the utility could simply justify every project or program with amorphous,
11 unsupported claims of reducing restoration costs and/or outage time.

12 Further, Gulf has proposed several new projects which are vague in scope and purpose.
13 The Transmission and Substation Resiliency Plan has no description of projects, priority
14 of projects, or any substantiated benefits. The only tangible information is \$49,720,000 in
15 costs, with no correlated benefits to compare. Thus, the Commission does not have enough
16 information to evaluate the sufficiency of this program, and in my expert opinion, should
17 not approve it. The Underground Lateral Program has an ill-defined priority scheme and is
18 not shown to be have sufficient benefits (actually no benefits are defined) relative to the
19 cost of the program. This is especially true since more of Gulf's laterals are along the roads
20 when compared to FPL which utilizes back lot line construction in older portions of the
21 FPL system.⁴² It is not clear if every Gulf lateral on a feeder is to be undergrounded as is
22 the case with FPL, or if Gulf will prioritize individual laterals on the system/feeders. The
23 Commission does not have enough information to evaluate the sufficiency of this program,

⁴² See Exhibit MS-1, Appendix C, p. 20-21

1 and therefore, in my expert opinion, should not approve it. Although I can see value in a
2 first-year pilot program, the pilot program should be limited, and the information resulting
3 from it should be thoroughly evaluated before the Commission grants approval for this
4 program on a permanent basis. I also recommend disallowing the flood monitoring system
5 since Gulf has not experienced substation flooding. While there have been some issues
6 with switch house damage, Gulf has failed to demonstrate the benefits of this program.

7 I also recommend that Commission direct Gulf to file an updated SPP with a rate impact
8 analysis that considers the impact of the COVID-19 pandemic. In the alternative, If such
9 an update is ordered, it would not be unreasonable for the Commission to allow Gulf to
10 proceed with submitting for cost recovery core programs such as inspections and
11 vegetation management, and delay consideration of other hardening programs until Gulf
12 has prepared an analysis on the rate impacts of these programs with the economic impact
13 of COVID-19 pandemic.

14 I also recommend metrics which can be used to determine the effectiveness of the SPP on
15 a going forward basis. These resiliency metrics should include Electric Service, Critical
16 Electric Service, Restoration, Monetary, and Community Focus. These metrics will
17 provide stakeholders vital information regarding the resiliency of the system.

18

19 **Q. DOES THIS COMPLETE YOUR PREFILED TESTIMONY?**

20 A. Yes, it does.

Exhibit KJM-1



KEVIN J. MARA, P.E.

Docket No. 20200071-EI
Curriculum Vitae
Exhibit KJM-1
Page 1 of 6

Exec. Vice President & Principal Engineer

EDUCATION

BS Electrical Engineering, Georgia Institute of Technology, 1982

PROFESSIONAL MEMBERSHIPS

Institute of Electrical and Electronic Engineers Power Engineering Society – Senior Member

National Electric Safety Code Subcommittee 5 – Alternate Member

Past Member - Insulated Conductor Committee

PROFESSIONAL REGISTRATIONS

Registered Professional Engineer in Alabama, Arkansas, Georgia, Florida, Idaho, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Carolina, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, and Wisconsin.

AREAS OF EXPERTISE

Overhead and Underground Distribution Design, Distribution System Planning, Power System Modeling and Analysis, Training

DESIGN

Mr. Mara has over 30 years of experience as a distribution engineer. He worked six years at Savannah Electric as a Distribution Engineer and ten years with Southern Engineering Company as a Project Manager. At Savannah Electric, Mr. Mara gained invaluable field experience in the operation, maintenance, and design of transmission and distribution systems. While at Southern Engineering, Mr. Mara performed planning studies, general consulting, underground distribution design, territorial assistance, and training services. Presently, Mr. Mara is a Vice President at GDS Associates, Inc. and serves as the Principal Engineer for GDS Associates' engineering services company known as its trade name Hi-Line Engineering.

Overhead Distribution System Design

Mr. Mara is in responsible charge of the design of distribution lines for many different utilities located in a variety of different terrains and loading conditions. Mr. Mara is in responsible charge of the design of over 100 miles of distribution line conversions, upgrades, and line reinsulation each year. Many of these projects include acquisition of right-of-way, obtaining easements, and obtaining permits from various local, state and federal agencies. In addition, Mr. Mara performs inspections at various stages of completion of line construction projects to verify compliance of construction and materials with design specifications and applicable codes and standards.

Underground Distribution System Design

Mr. Mara has developed underground specifications for utilities and was an active participant on the Insulated Conductor Committee for IEEE. He has designed underground service to subdivisions, malls, commercial, and industrial areas in various terrains. These designs include concrete-encased ductlines, direct-burial, bridge attachments, long-bores, submarine, and tunneling projects. He has developed overcurrent and overvoltage protection schemes for underground systems for a variety of clients with different operating parameters.

PLANNING

Mr. Mara has prepared numerous planning studies for electric cooperatives and municipal systems in various parts of the country. The following is a representative list of specific projects:

- ③ Little River Electric Cooperative, SC
 - Long Range Plan
 - Four Construction Work Plans
- ③ Maxwell AFB, AL - Long Range Plan
- ③ Fall River Electric, ID – Long Range Plan
- ③ Chugach Electric, AK - Long Range Plan
- ③ Newberry Electric Cooperative, SC - Construction Work Plan, Long Range Plan
- ③ Lackland AFB, TX - Long Range Plan
- ③ Rio Grande ECI, TX - Construction Work Plan, Long Range Plan
- ③ Northern Virginia Electric Cooperative, VA - Construction Work Plan
- ③ BARC Electric Cooperative - Construction Work Plan
- ③ Dixie Electric Cooperative - Construction Work Plan
- ③ Joe Wheeler Electric Cooperative - Construction Work Plan
- ③ Cullman Electric Cooperative - Long Range Plan, Construction Work Plan

TRAINING SEMINARS

Mr. Mara has developed engineering training courses on the general subject of distribution power line design. These seminars have become extremely popular with more than 25 seminars being presented annually and with more than 4,000 people having attended seminars presented by Mr. Mara. A 3-week certification program is offered by Hi-Line Engineering in eleven states. The following is a list of the training material developed and/or presented:

- ③ Application and Use of the National Electric Safety Code
- ③ How to Design Service to Large Underground Subdivisions
- ③ Cost-Effective Methods for Reducing Losses/Engineering Economics
- ③ Underground System Design
- ③ Joint-Use Contracts – Anatomy of Joint-Use Contract
- ③ Overhead Structure Design
- ③ Easement Acquisition
- ③ Transformer Sizing and Voltage Drop

Construction Specifications for Electric Utilities

Mr. Mara has developed overhead construction specifications including overhead and underground systems for several different utilities. The design included overcurrent protection for padmounted and pole mounted transformers. The following is a representative list of past and present clients:

- ③ Cullman EMC, Alabama
- ③ Blue Ridge EMC, South Carolina
- ③ Buckeye Rural Electric Cooperative, Ohio
- ③ Three Notch EMC, Georgia
- ③ Little River ECI, South Carolina
- ③ Lackland Air Force Base
- ③ Maxwell Air Force Base

SYSTEM PRIVATIZATION/EVALUATION

- ③ Central Electric Power Cooperative, Columbia, SC
 - 2017 Independent Certification of Transmission Asset Valuation, Silver Bluff to N. Augusts 115kV
 - 2015 Independent Certification of Transmission Asset Valuation, Wadmalaw 115kV
- ③ Choctawhatchee Electric Cooperative, DeFuniak Springs, FL
 - Inventory and valuation of electrical system assets at Eglin AFB prior to 40-year lease to private-sector entity.

PUBLICATIONS

- ③ Co-author of the NRECA “Simplified Overhead Distribution Staking Manual” including editions 2, 3 and 4.
- ③ Author of “Field Staking Information for Overhead Distribution Lines”
- ③ Author of four chapters of “TVPPA Transmission and Distribution Standards and Specifications”

TESTIMONIES & DEPOSITIONS

Mr. Mara has testified as an expert at trial or by deposition in the following actions.

- ③ Deposition related to condemnation of property
Newberry ECI v. Fretwell, 2005
State of South Carolina
- ③ Testimony in Arbitration regarding territory dispute
Newberry ECI v. City of Newberry, 2003
State of South Carolina
Civil Action No. 2003-CP-36-0277
- ③ Expert Report and Deposition, 2005
United States of America v. Southern California Edison Company
Case No CIV F-01-5167 OWW DLB
- ③ Expert Report and Deposition, 2005
Contesting a transmission condemnation
Moore v. South Carolina Electric and Gas Company
United States District Court of South Carolina
Case No. 1:05-1509-MBS
- ③ Affidavit October 2007
FERC Docket No. ER04-1421 and ER04-1422
Intervene in Open Access Transmission Tariff filed by Dominion Virginia Power
- ③ Affidavit February 26, 2008
FERC Docket No. ER08-573-000 and ER08-574-000
Service Agreement between Dominion Virginia Power and WM Renewable Energy, LLC

- ③ Direct Filed Testimony date December 15, 2006
Before the Public Utility Commission of Texas
SOAH Docket No 473-06-2536
PUC Docket No. 32766
- ③ Expert Report and Direct Testimony April 2008
United States Tax Court
Docket 25132-06
Entergy Corporation v. Commissioner Internal Revenue
- ③ Direct Testimony September 17, 2009
Public Service Commission of the District of Columbia
Formal Case 1076
Reliability Issues
- ③ Filed Testimony regarding the prudence of hurricane restoration costs on behalf of the City of Houston, TX, 2009
Cozen O'Connor P.C.
TX PUC Docket No. 32093 – Hurricane Restoration Costs
- ③ Technical Assistance and Filed Comments regarding line losses and distributive generation interconnection issues, 2011
Office of the Ohio Consumer's Counsel
OCC Contract 1107, OBM PO# 938 for Energy Efficiency T & D
- ③ Technical Assistance, Filed Comments, and Recommendations evaluating Pepco's response to Commission Order 15941 concerning worst reliable feeders in the District of Columbia. 2011, 2012 Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Technical Assistance, Filed Comments, and Recommendations on proposed rulemaking by the District of Columbia PSC amending the Electric Quality of Service Standards (EQSS), 2011.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Yearly Technical Review, Filed Comments, and Recommendations evaluating Pepco's Annual Consolidated Report for 2011 through 2018.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Technical Evaluation, Filed Comments, and Recommendations evaluating Pepco's response to a major service outage occurring May 31, 2011. (2011)
Office of the People's Counsel of the District of Columbia
Formal Case Nos. 766 and 1062
- ③ Technical Assistance, Filed Comments, and Recommendations evaluating Pepco's response to Commission Order 164261 concerning worst reliable neighborhoods in the District of Columbia, 2011.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Technical Review, Filed Comments, and Recommendations on Pepco's Incident Response Plan (IRP) and Crisis Management Plan (CMP), 2011.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766

- ③ Technical Assistance, Filed Comments, and Recommendations assessing Pepco's Vegetation Management Program and trim cycle in response to Oder 16830, 2012.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Technical Review, Filed Comments, and Recommendations on Pepco's Secondary Splice Pilot Program in response to Order 16426, 2012.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766 and 991
- ③ Technical Review, Filed Comments, and Recommendations on Pepco's Major Storm Outage Plan (MSO), 2012 - active.
Office of the People's Counsel of the District of Columbia
Formal Case No. 766
- ③ Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2011-2012.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1087 – Pepco 2011 Rate Case. Hearing transcript date: February 12, 2012.
- ③ Evaluation of and Filed Comments on Pepco's Storm Response, 2012.
Office of the People's Counsel of the District of Columbia
Storm Dockets SO-02, 03, and 04-E-2012
- ③ Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2013 - 2014.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1103 – Pepco 2013 Rate Case. Hearing transcript date: November 6, 2013.
- ③ Evaluation of and Filed Comments on Prudency of 2011 and 2012 Storm Costs, 2013 – 2014.
State of New Jersey Division of Rate Counsel
BPU Docket No. AX13030196 and EO13070611
- ③ Technical Assistance and Direct Filed Testimony for DTE Acquisition of Detroit Public Lighting Department, 2013 – 2014.
Office of the State of Michigan Attorney General
Docket U-17437
- ③ Evaluation of and Filed Comments on the Siemens Management Audit of Pepco System Reliability and the Liberty Management Audit, 2014
Office of the People's Counsel of the District of Columbia
Formal Case No. 1076
- ③ Expert witness for personal injury case, District of Columbia
Koontz, McKenney, Johnson, DePaolis & Lightfoot LLP
Ghafoorian v Pepco 2013 - 2016
Plaintive expert assistance regarding electric utility design. operation of distribution systems and overcurrent protection systems.
- ③ Technical Assistance and Direct Filed Testimony in the Matter of the Application for approval of the Triennial Underground Infrastructure Improvement Projects Plan, 2014 – 2017.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1116
- ③ Technical Assistance and Direct Filed Testimony in the Matter of the Merger of Exelon Corporation, Pepco Holdings, Inc., Potomac Electric Power Company, Exelon Energy Delivery Company, LLC and New Special Purpose Entity, LLC, 2014 – 2016.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1119. Hearing transcript date: April 21, 2015.

- ③ Technical Assistance to Inform and advise the OPC in the matter of the investigation into modernizing the energy delivery system for increased sustainability. 2015 - active
Office of the People's Counsel of the District of Columbia
Formal Case No 1130.
- ③ Technical Assistance and Direct Filed Testimony in the Matter of the Merger of Exelon Corporation and Pepco Holdings, Inc., 2014 – 2016.
State of Maryland and the Maryland Energy Administration
Case No. 9361
- ③ Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2015 – 2016.
State of Oklahoma Office of the Attorney General
Cause No. PUD 201500273 - OG&E 2016 Rate Case. Hearing transcript date: May 17, 2016.
- ③ Technical Assistance and Filed Comments on Notice of Inquiry, The Commission's Investigation into Electricity Quality of Service Standards and Reliability Performance, 2016 - active.
Office of the People's Counsel of the District of Columbia
RM36-2016-01-E
- ③ Technical Assistance and Direct Filed Testimony for fully litigated rate case, 2016 - 2017.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1139 – Pepco 2016 Rate Case. Hearing transcript date: March 21, 2017.
- ③ Technical Assistance in the Matter of the Application for approval of the Biennial Underground Infrastructure Improvement Projects Plan, 2017.- active
Office of the People's Counsel of the District of Columbia
Formal Case No. 1145
- ③ Technical Assistance to Inform and advise the OPC Regarding Pepco's Capital Grid Project, 2017 - active.
Office of the People's Counsel of the District of Columbia
Formal Case No. 1144. Confidential Comments and Confidential Affidavit filed November 29, 2017.
- ③ Expert witness for personal injury case Mecklenburg County, NC
Tin, Fulton, Walker & Owen, PLLC
Norton v Duke, Witness testimony December 1, 2017
- ③ Technical assistance and pre-filed Direct Testimony on behalf of the Joint Municipal Intervenors in a rate case before the Indiana Utility Regulatory Commission; 2017 - active.
Cause No. 44967. Testimony filed November 7, 2017.
- ③ Prefiled Direct Testimony and Prefiled Surrebuttal Testimony on behalf of the Vermont Department of Public Service in a case before the State of Vermont Public Utility Commission, Tariff Filing of Green Mountain Power Corp.
Case No. 18-0974-TF. Direct Testimony Filed August 10, 2018. Surrebuttal Testimony Filed October 8, 2018.
- ③ Technical assistance and pre-filed Direct Testimony on behalf of McCord Development, Inc. and Generation Park Management District against CenterPoint Energy Houston Electric, LLC in a case before the State Office of Administrative Hearings of Texas.
TX PUC Docket No. 48583. Testimony filed April 5, 2019.