



**NORTH CAROLINA
PUBLIC STAFF
UTILITIES COMMISSION**

September 8, 2020

Ms. Kimberley A. Campbell, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

Re: Docket No. E-7, Sub 1213 – Application for Approval of Proposed Prepaid Advantage Program; Docket No. E-7, Sub 1214 – Application for General Rate Case; and E-7, Sub 1187 – Petition of Duke Energy Carolinas, LLC for an Accounting Order to Defer Incremental Storm Damage Expenses Incurred as a Result of Hurricanes Florence and Michael and Winter Storm Diego

Dear Ms. Campbell:

In connection with the above-referenced dockets, I transmit herewith for filing on behalf of the Public Staff the supplemental testimony of Jeff Thomas, Utilities Engineer, Electric Division.

By copy of this letter, we are forwarding copies to all parties of record.

Sincerely,

/s/ Dianna W. Downey
Chief Counsel
dianna.downey@psncuc.nc.gov

DWD/cia

Attachment

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Sep 08 2020

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1187

In the Matter of
Petition of Duke Energy Carolinas, LLC
for an Accounting Order to Defer
Incremental Storm Damage Expenses
Incurred as a Result of Hurricanes
Florence and Michael and Winter Storm
Diego

DOCKET NO. E-7, SUB 1213

In the Matter of
Application of Duke Energy Carolinas,
LLC, for Adjustment of Rates and
Charges Applicable to Electric Utility
Service in North Carolina

DOCKET NO. E-7, SUB 1214

In the Matter of
Application of Duke Energy Carolinas,
LLC, for Adjustment of Rates and
Charges Applicable to Electric Utility
Service in North Carolina

SUPPLEMENTAL
TESTIMONY OF
JEFF T. THOMAS
PUBLIC STAFF – NORTH
CAROLINA UTILITIES
COMMISSION

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUBS 1187, 1213 AND 1214

Supplemental Testimony of Jeff T. Thomas

On Behalf of the Public Staff

North Carolina Utilities Commission

September 8, 2020

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **PRESENT POSITION.**

3 A. My name is Jeff Thomas. My business address is 430 North
4 Salisbury Street, Dobbs Building, Raleigh, North Carolina. I am an
5 Engineer with the Energy Division of the Public Staff – North Carolina
6 Utilities Commission.

7 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THESE**
8 **PROCEEDINGS?**

9 A. Yes.

10 **Q. PLEASE DESCRIBE THE PURPOSE OF YOUR SUPPLEMENTAL**
11 **TESTIMONY IN THIS PROCEEDING.**

12 A. The purpose of my supplemental testimony is to summarize the
13 Public Staff's investigation into Duke Energy Carolinas, LLC's

1 ("DEC") Second Supplemental Direct Testimony and Exhibits of
2 Jane L. McManeus and Second Supplemental Direct Testimony of
3 Michael J. Pirro, filed on July 2, 2020 ("May Update"). My testimony
4 specifically addresses the Public Staff's investigation into
5 transmission and distribution ("T&D") assets placed in service from
6 February 1, 2020 through May 31, 2020 for DEC ("Update Period").

7 **Q. PLEASE SUMMARIZE THE ASSETS PLACED INTO SERVICE**
8 **DURING THE UPDATE PERIOD.**

9 A. As seen in the table below, during the Update Period DEC placed
10 \$405.6 million into rate base in T&D investments. These investments
11 constitute a wide variety of investments, including traditional T&D
12 expenditures, those related to the Grid Improvement Plan ("GIP"),
13 and some related to the Smart Grid Technology Plan ("SGTP"). DEC
14 has identified approximately \$34.7 million in GIP related investments
15 during the Update Period.¹

¹ This only captures GIP related spend for projects greater than \$500 thousand. The actual amount of GIP spend may be slightly higher.

Table 1: T&D Assets Placed in Service, North and South Carolina (millions of dollars).

Source: DEC DR 6 (6th Supplemental)

	Transmission	Distribution	Total
DEC (February 2020 through May 2020)	127.8	277.8	405.6
GIP Related (projects > \$500k)	10.5	24.2	34.7

Q. PLEASE SUMMARIZE THE SCOPE OF YOUR INVESTIGATION.

A. The Public Staff audited numerous DEC T&D projects. The audit covered approximately 64% of DEC's total transmission investment and 12% of DEC's total distribution investment for the Update Period. During the course of our investigation, we requested project management documentation, work breakdown structures with all project expenditures, cost variance reports, status of GIP related projects, requests and presentations to DEC boards, and other pertinent information.² The Public Staff reviewed this information and held multiple conference calls with DEC in order to determine if the investments included in rate base in the May Update were reasonable and prudently incurred.

² The level of detail associated with each project depends on the total budgeted project spend. Generally, smaller projects have less documentation and require fewer company approvals than larger projects.

1 **Q. WHAT DID THE RESULTS OF YOUR INVESTIGATION SHOW?**

2 A. During the Update Period, DEC closed to rate base SOG
3 Segmentation and Automation projects of approximately \$7.1
4 million.³ This project is a “blanket project” that tracks related
5 expenses without a specific start or end date. This practice is
6 common for projects such as SOG, which are comprised of many
7 smaller projects that are rapidly completed.

8 During discovery, the Public Staff found that the \$7.1 million
9 represents SOG Segmentation and Automation projects that DEC
10 closed to plant on 58 distribution circuits. Out of the 58 circuits, SOG
11 is fully enabled on two circuits, or 3.5% of the total. Thirteen circuits
12 (22%) are slated for SOG enablement in 2020, and 43 circuits (74%)
13 are not expected to be fully enabled until 2021 or 2022.⁴

³ Project ID SGSELFND represents the North Carolina distribution portion. Project ID SGSELFSD was also closed to plant for approximately \$1.7 M, representing the South Carolina distribution portion.

⁴ DEC indicated that the schedule provided during discovery was conservative, and that they hope to be able to complete some circuits early.

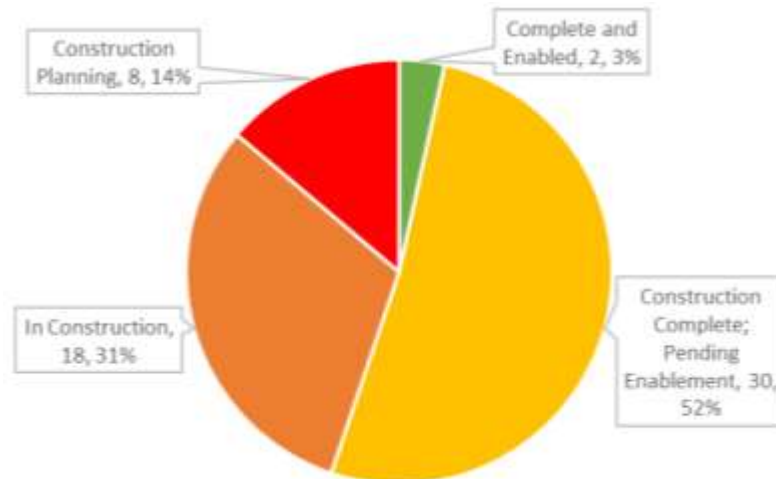


Figure 1: Status of SOG Circuits closed to plant in Update Period (# of circuits, % of circuits)

Q. CAN YOU EXPLAIN WHAT YOU MEAN BY FULLY ‘ENABLED’?

A. Yes. In order for a circuit to be fully “enabled” for SOG, DEC must first undertake several steps referred to as “SOG construction”: (1) segment the circuit into sections so any faults can be isolated; (2) tie the circuit to a second, backup circuit; and (3) ensure each circuit and substation has sufficient capacity to supply both circuits’ designed SOG load.⁵

Once these steps are completed, the interconnected circuits and SOG devices must be programmed into the Advanced Distribution Management System software to enable automatic responses to faults. In all cases, SOG circuits are enabled in “teams” – two or more

⁵ The Company SOG standard for a pair circuits seeks to allow the first SOG circuit to pick up 70% of the second SOG circuit’s peak load during 90% of the time.

1 circuits that are tied together to provide the segmentation and
2 backfeed abilities that are necessary for SOG to function.

3 **Q. ONCE ENABLED, HOW DOES SOG OPERATE?**

4 **A.** In the event of a circuit segment fault: (1) the enabled SOG
5 equipment isolates that circuit segment; (2) the substation continues
6 to feed the circuit segments between the fault and the substation;
7 and (3) the backup circuit begins feeding the circuit segments
8 between the fault and the backup circuit. Thus, only the circuit
9 segment with the fault experiences a sustained outage. In a SOG
10 enabled circuit, all of these steps happen automatically, without
11 human intervention, and typically take 2-3 minutes to resolve.

12 **Q. CAN YOU EXPLAIN WHY SOME CIRCUITS ARE NOT YET FULLY**
13 **ENABLED?**

14 **A.** DEC has explained the concept of circuit enablement and noted that
15 the highly trained personnel who can operate the software designed
16 to locate, isolate, and restore faults during a SOG event can only
17 program so many circuits at a time. The circuits and SOG devices
18 are programmed into software that is specific to fault location,
19 isolation, and restoration activities.⁶ Prior to this year, DEC stated
20 that SOG investments have been proceeding at a manageable pace;

⁶ The software used by DEC is called Yukon Feeder Automation software and is separate from DEC's normal operational software.

1 however, as the number of circuits targeted for SOG has increased,
2 the demand for the highly skilled personnel has increased. This has
3 led to delays in enabling SOG circuits after construction is complete.

4 **Q. IF THESE SOG CIRCUIT INVESTMENTS ARE NOT FULLY**
5 **ENABLED AT THIS TIME, ARE THEY STILL CONSIDERED USED**
6 **AND USEFUL?**

7 A. Based on a discussion with the Public Staff Accounting Division, and
8 advice of counsel, I believe these SOG circuits meet the technical
9 and legal definitions of plant in service and thus I do not recommend
10 any revenue adjustments. These SOG circuits are used and useful
11 in providing utility service, even though most are not fully enabled
12 and producing the full benefits as described by DEC witness Oliver
13 in his testimony in this proceeding.

14 **Q. ARE THE PARTIALLY ENABLED SOG CIRCUITS PROVIDING**
15 **ANY BENEFITS TO CUSTOMERS AT THIS TIME?**

16 A. There are some potential benefits associated with partially enabled
17 SOG circuits. If a SOG team has completed construction but the
18 circuits are not enabled, the fault isolation process described above
19 can still happen, albeit manually. Human operators in DEC's
20 distribution control center can manually segment and backfeed the
21 faulted circuit; but the manual process is slower and produces fewer
22 reliability benefits when contrasted with the rapid and automatic

1 operation of SOG equipment. Realizing these partial benefits is
2 contingent upon DEC implementing a protocol to manually operate
3 the SOG circuits prior to full enablement. The full benefits will be
4 delayed until completion of the full SOG construction and
5 programming steps discussed earlier in my testimony.

6 **Q. DO YOU HAVE ANY OTHER COMMENTS BASED ON YOUR**
7 **INVESTIGATION?**

8 A. Yes. As evidenced in my earlier testimony, it is apparent that
9 traditional concepts of “used and useful” do not fully account for all
10 the issues that must be considered when evaluating GIP investments
11 and programs. The complexity with which different GIP programs,
12 software, and physical devices interact means that “full functionality”
13 may not neatly match up with “used and useful.”⁷ This is especially
14 true given the scale and pace of T&D investments envisioned under
15 DEC’s GIP.

16 This potential timing mismatch underscores the importance of
17 completing GIP projects promptly, with as little delay as possible, so
18 that benefits can be tracked and reported pursuant to the terms of
19 the Settlement, if approved by the Commission. It will be more

⁷ Advanced Metering Infrastructure (AMI meters) is a good example of this principle. While AMI meters may be used and useful in recording and transmitting electricity consumption, the lack of software or programs on the back end means ratepayers may not immediately enjoy the full benefits of a technology at the time it goes into rate base.

1 challenging to assess the cost effectiveness of GIP-related projects,
2 and adjust the overall course of the GIP, in an ongoing manner if
3 customers may not begin realizing the benefits of today's rate based
4 investments for a year or more. Nevertheless, DEC should be careful
5 to balance the incremental costs associated with expedited project
6 completion against the overall value to customers.

7 The challenges of reviewing the costs and benefits of certain GIP
8 programs and investments also highlights the importance of detailed
9 and transparent reporting and review of the GIP.

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

11 A. Yes.