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DEF’s Response to OPC's First Set of Interrogatories Nos. 1-53

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Review of Storm Protection Plan pursuant to Rule 25-6.030, F.A.C., Duke Energy Florida, LLC.	DOCKET NO. 20220050-EI

Served: April 13, 2022

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO CITIZENS' FIRST SET OF INTERROGATORIES (NOS. 1-53)

Duke Energy Florida, LLC ("DEF") responds to the Citizens of the State of Florida, through the Office of Public Counsel's ("Citizens" or "OPC") First Set of Interrogatories to DEF (Nos. 1-53) as follows:

INTERROGATORIES

1. Please provide a detailed description of all new programs and projects compared to those included in the Company's initial approved (2020) storm protection plan filings (including any modifications considered or approved in 2020), including the detailed information for each program required by Rule 25-6.030(3)(d) and (e).

Response:
DEF's Storm Protection Plan 2023-2032 (SPP 2023) does not contain any new programs compared to the initial approved SPP 2020. For the information required by Rule 25-6.030(3)(d) and (e), please see DEF's SPP 2023 filed in Docket No. 20220050 on April 11, 2022. The specific list of year 1 (2023) projects are included in exhibit BML-1.

2. Please provide a detailed description of all completed, modified, and/or expanded programs and projects compared to those included in the Company's initial approved (2020) storm protection plan filings (including any modifications considered or approved in 2020), including the detailed information for each program required by Rule 25-6.030(3)(d) and (e).

Response:

Transmission:

DEF's 2023-2032 Storm Protection Plan includes the same programs as DEF's approved 2020-2029 Storm Protection Plan, as shown in exhibit BML-1. DEF Transmission scopes are generally the same as SPP 2020, only modified to account for updated cost information and to show the three additional years of the programs.

Distribution:
DEF's SPP 2023-2032 (SPP 2023) includes the same programs as DEF's SPP 2020, as shown in exhibit BML-1. DEF Distribution's scopes are generally the same as SPP 2020, only modified to account for updated cost information and expanded to show the three additional years of the programs -- with the exception of the Self-Optimizing Grid program. In SPP 2020, this program was planned to be completed in 2027 but in SPP 2023 the planned completion is 2025.

3. Please provide a separate detailed comparison of the actual benefits and costs for each program and project to the forecast benefits and costs set forth in the Company's initial approved (2020) storm protection plan filings (including any modifications considered or approved in 2020).

Response:

DEF has not been impacted by a major storm event since the initial approval of the 2020-2029 Storm Protection Plan. Exhibit BML-2, filed with DEF's Storm Protection Plan 2023-2032 (SPP 2023) in Docket 20220050 provides expected benefits. Our annual expenses related to SPP have been included in our 2020 and 2021 Storm Protection Plan Cost Recovery filings and our inaugural 2021 Storm Protection Plan Annual Status Report (SPPASR) filing.

4. Please describe specifically how the Company measures the success of each approved storm protection program and project "to achieve the objectives of reducing restoration costs and outage times associated with extreme weather events and enhancing reliability."

Response:
DEF has a forensics program in place to review damage caused by an extreme weather event to compare damage to hardened assets versus non-hardened assets. However, there has not been an extreme weather event that has directly impacted hardened assets since the transition to the Storm Protection Plan.
DEF tracks improvements in system reliability associated with the Self-Optimizing Grid (SOG) and Lateral Hardening Underground programs throughout the year, outside of extreme weather events, to measure how the programs enhance reliability.

- Self-Optimizing Grid (SOG)
  - SOG benefits are measured by comparing the actual CI/CMI of an event against what would have occurred for that event had the SOG team not been in place.

- Lateral Hardening Underground
  - LHU benefits are measured by comparing the historical performance of the previously overhead line to the performance of the new underground line.

The following questions relate to the topic area underlined below.

Overhead Construction Standards and Policies

5. State the BIL level used as a goal for new construction.

Response:
IEEE 1410 defines BIL as the crest value of a standard lightning impulse for which the insulation exhibits a 90% probability to withstand (or a 10% probability of failure) under specified conditions. Equipment manufacturers rate and test their equipment. Most of our Florida system is 12.47kV. The industry standard BIL rating for equipment of that voltage is 95kV – 110kV. In our costal zones we usually select equipment with a BIL rating of 120kV or more to help with the salty environment.

6. Explain what Critical Flashover (CFO) is not used in the determining the spacing of constructions and insulators instead of BIL.

Response:
DEF uses both BIL and CFO as they are closely related. BIL is generally an equipment rating and CFO is generally an overall rating given to a structure. DEF uses the guidelines in IEEE 1410 to calculate the CFO for our structures. Basically, DEF aims at a CFO for structures of 450kV or more which influence the spacing and insulation levels used in our design. This is achievable on distribution structures without equipment. For structures with equipment, we utilize lightning arresters to mitigate flashover issues.

7. State whether DEF uses Grade C for most distribution lines with loading from NESC Rule 250B (except for NESC specified situations as defined in NESC Table 242-1).

Response:

For SPP work, DEF uses Grade B and meets loading from both NESC 250B and 250C (without 60 ft exception). DEF is also transitioning all new construction to these standards.

Substations in Flood Zones

8. For 2020, 2021, 2022 identify each substation where DEF has deployed

a. Sand bagging

b. Dam systems, and

c. Other flood protection systems.

Response:

DEF has deployed temporary sandbags added to block water entry on the control house door at the Occidental #3 Substation on June 7, 2020. DEF has not utilized dam systems or any "other flood protection systems" at any substations during the identified period.

9. Provide the annual cost for substation flood mitigation.

Response:

The DEF Storm Protection Plan 2023 – 2032 filing includes the annual cost for Flood Mitigation in Exhibit BML-1.

10. Provide a list of each substation where flood mitigation has occurred and state whether the mitigation measure is permanent or a temporary measure (Ex: sand bagging).

Response:

Please see DEF's response to OPC Interrogatory 1.8.

Grid Investment Plan

11. Explain how DEF prioritizes which group of feeders are to be upgraded with the ASD system and the order in which the upgrades occur.

Response:

DEF prioritizes feeders for the SOG Program based on customer count and a 4-year average of feeder backbone customer interruption (CI) data. Feeders with the highest customer count and CI are ranked higher as those are the circuits with the largest opportunity for improvement. Once a feeder is selected and prioritized based on customer count and CI, DEF then develops a 'Team' (SOG Team) around each prioritized feeder by reviewing available relief feeder ties (requires a review of grid topology). Other aspects that influence priority are societal impacts (i.e., feeders with schools, hospitals, emergency operations centers, or airports), resource efficiency, and load-growth considerations.

12. Provide the average number of automated switches that are required for each feeder in order to automate that feeder.

Response:

For the feeders that have already been completed under the Self-Optimizing Grid program, the average number of devices per feeder is 5.39.

13. State the average installation cost for an automated switch.

Response:
The current average installation cost of an automated switch as of 3-31-22 is approximately $69,701; by definition, individual switches will result in greater installation costs, while others are expected to cost less. Actual costs will vary based on the work required for each individual installation.

14. Provide the number of miles of small copper conductor replaced in 2020, 2021, and 2022.

Response:
The numbers in the chart below represent the Deteriorated Conductor program. As described in DEF's SPP 2020, Exhibit No. JWO-1 (approved in Docket No. 20200069), the Deteriorated Conductor program focused on copper conductor (typically #4 & #6) and smaller aluminum (typically #4). The values are approximate and represent both copper and aluminum small conductor replacements as the program that these projects were a part of did not count the conductors separately.

2020	44.73 miles
2021	50.23 miles
2022 (projected)	13.67 miles

15. Provide the remaining number of miles of small copper conductor DEF plans to replace under the 10-year plan.

Response:

As explained in SPP 2020 (see also DEF's response to Interrogatory 1.14), DEF incorporated the Deteriorated Conductor program that was targeting small conductors (copper and aluminum) into the Lateral Hardening program. The Lateral Hardening program encompasses all of the laterals on a circuit, not just those that contain small copper or aluminum, as it is designed to address structure hardening, deteriorated conductor replacement, replacing open wire secondary, replacing fuses with automated line devices, pole replacement (when needed), line relocation, and/or hazard tree removal. Because this program is targeting all laterals,

regardless of conductor type, DEF does not have an estimate of small copper conductor that will be replaced under the 10-year plan.

16. Provide the actual or projected annual expenditures for 2020, 2021, and 2022 for the copper conductor replacements related to deteriorated conductors or small copper.

Response:

The values below represent the actual spent or projected for the Deteriorated Conductor program, which includes both copper conductor and aluminum conductor replacements as described in DEF's response to OPC Interrogatory 1.14.

2020	$26,620,857
2021	$16,480,573
2022 Projected	$6,934,202

17. Describe how DEF determines the type of conductor to be used in the replacement projects (ACSR, AAAC, AAC, etc.).

Response:

DEF has four overhead primary aluminum conductors that are approved for new construction: #2 AAAC, #1/0 AAAC, 336.4 AAC, and 795 AAC. Typically, conductor type/size is determined by electrical load the conductor is required to serve.
DEF also evaluates conductor selection based on mechanical loading. All of Florida resides in NESC light loading zone per Figure 250-1. For the application of 250B, loading is calculated at 30ºF, with a 9lbs/sqft wind plus a constant of .05 lbs/ft on conductors applied in the direction that produces the greatest loading on the structure. The NESC also defines the extreme wind values per Figure 250-2(d). For the application of 250C loading, we use the wind value for the location defined by Figure 250-2(d) which ranges from 90 to 140 mph in the DEF territory.

18. Provide the number of CSP transformers which were retrofitted in 2020, 2021, and 2022.

Response:

The numbers provided below include all transformers that were addressed during the Transformer Retrofit program, which is inclusive of CSP units and those also that needed to be replaced due to condition or brought up to modern standards.

2020	4593
2021	2443

2022 (projected)	392

19. Provide the actual or projected annual expenditures for the copper conductor replacements related to the transformer retrofit in 2020, 2021, and 2022.

Response:

2020	$17,702,476
2021	$8,434,546
2022 (Projected)	$1,835,922

20. Provide the number of CSP remaining in service which require retrofitting.

Response:

There are 12,483 CSP transformers in DEF's geospatial information system. These transformers are field verified during projects and are addressed as part of standing orders if work is required.

Targeted Underground

21. Explain how DEF determines which lines need to be undergrounded.

Response:

DEF is transitioning the Targeted Undergrounding program to the Lateral Hardening program in 2022. The Targeted Underground program utilized reliability data and field conditions to determine lines to be undergrounded as outlined in Docket No. 20200069, Exhibit JWO-1.

The following response refers to DEF's process of determining which lines need to be undergrounded in its Lateral Hardening program as described in SPP 2023.

After a feeder is selected to be addressed by the Lateral Hardening Program, individual laterals are assessed by reviewing the 10-year history of outages associated to vegetation and animal cause codes and conducting an assessment of the lateral within the geospatial information system which includes satellite imagery to create an initial determination if the lateral should be converted to underground (LHU target) or hardened overhead (LHO target).

An additional field review is performed during the detailed design stage on all laterals selected to determine if location/field conditions (rear lot construction, heavy vegetation) drive a change in the initial target determination.

22. Explain how DEF prioritizes the undergrounding of lines.

Response:

As described in SPP 2023, the laterals are assessed by the Cost Benefit Analysis ranking at a feeder level utilizing Guidehouse's methodology described in SPP 2023-2032, Exhibit BML-

2. The Cost Benefit Analysis prioritizes the feeders that will be addressed by the Lateral Hardening program.

23. State whether each of the following system components are or will be undergrounded:

a. Primary feeder

b. Primary Lateral

c. Secondary conductors

d. Service drops

Response:

A: Feeders are undergrounded on an exception basis during the Feeder Hardening program, primarily driven by physical constraints of rebuilding the existing overhead line in place.

B: Primary laterals are typically the main focus of the undergrounding within the Lateral Hardening program and include any associated secondary and services.

C: Secondary will typically be undergrounded when the primary is undergrounded.

D: Services will typically be undergrounded when the primary/secondary source is undergrounded, assuming that the customers' facilities are able to be converted from an overhead service to an underground service.

Live Front Switchgear Replacement

24. Provide the number of live front switchgears replaced in 2020, 2021, and 2022.

Response:

Year	Total Replaced
2020	74
2021	44
2022 (projected)	52

25. Provide the actual or projected annual expenditures for live-front switchgear replacement in 2020, 2021, and 2022.

Response:

Year	Total Actuals
2020	$3,660,677
2021	$2,472,441

2022 Projected	$2,443,660

26. Provide the number of live front switchgears remaining to be replaced under this program.

Response:
Duke Energy Florida has approximately 640 live front switchgears remaining.

Back-lot to Front-lot Conversion

27. Provide the number of back-lot to front-lot conversions completed in 2020, 2021, and 2022.

Response:

2020	0
2021	2
2022	0

28. Provide the actual or projected annual expenditures for back-lot to front-lot conversions in 2020, 2021, and 2022.

Response:

2020 Actual	0
2021 Actual	$510,014
2022 Projected	$0

Deteriorated Conductor-Over Dutied

29. Provide the number of miles of over-dutied conductor actually or planned to be replaced in 2020, 2021, and 2022.

Response:

Please see DEF's response to Interrogatory 1.14, which shows the approximate mileage of conductors replaced as part of the Deteriorated Conductor program.

30. Provide the actual or projected annual expenditure for over-dutied conductor replacements in 2020, 2021, and 2022.

Response:

Please DEF's response to Interrogatory 1.16.

Submersible UG

31. Provide the number of transformers or related equipment which were replaced with stainless-steel equipment and submersible connections.

Response:

DEF is transitioning its Submersible UG program in 2021to the Underground Flood Mitigation program in 2022. The values for 2020 and 2021 in the chart below are representative of the equipment addressed within Submersible UG.

For 2022, the values below represent the estimated units to be addressed within the Underground Flood Mitigation program in SPP.

2020	4
2021	27
2022	50

32. Provide the actual or projected annual expenditures for equipment that has been or will be upgraded or replaced under the Submersible UG initiative for 2020, 2021, and 2022.

Response:

The 2022 value below is the projected amount to be spent in the Storm Protection Plan Underground Flood Mitigation program.

2020 Actual	$98,776
2021 Actual	$214,586
2022 Projected	$776,691

Feeder Ties

33. Provide the miles of new tie lines constructed in 2020, 2021, and 2022.

Response:

DEF has completed its Feeder Tie program that was a part of the 2019-2021 Storm Hardening Plan. The numbers below represent the approximate line miles constructed for the projects completed in the SHP for 2020 and 2021.

2020	6.5
2021	7.3
2022	0

DEF also constructs feeder ties as part of its Self-Optimizing Grid (SOG) program. The numbers below represent the approximated completed and projected miles for the projects completed or planned for SOG.

2020	4.1
2021	7.8
2022	22.2

34. Provide the actual or projected annual expenditures for these tie lines for 2020, 2021, and 2022.

Response:

DEF has completed its Feeder Tie program that was a part of the Storm Hardening Plan. The numbers below represent the actual expenditures for the projects completed in the SHP for 2020 and 2021.

2020 Actual	$3,359,264
2021 Actual	$1,716,827
2022 Projected	$0

DEF also constructs feeder ties as part of its Self-Optimizing Grid (SOG) program. The numbers below represent the actual and projected expenditures for the projects completed or planned for SOG.

2020 Actual	$1,633,472
2021 Actual	$4,868,764
2022 Projected	$16,443,586

Transmission-Replacement of Wood Poles with Concrete or Steel Poles

35. State whether the rebuild of transmission projects is included in DEF's Storm Hardening Plan. If the answer is yes, state which components including poles, conductors, and communication fibers are or will be rebuilt.

Response:

DEF's Storm Protection Plan 2023 – 2032 filing does not have any rebuild projects identified. Exhibit BML-1 on page 23 provides a description of the Structure Hardening program.

36. State whether the company considers a transmission rebuild project that is necessary to increase capacity where the line has wooden poles to be a storm hardening project. If the answer is yes, provide a list of all projects that fit this description which DEF projects will be rebuilt.

Response:

DEF's Storm Protection Plan 2023 – 2032 does not have any rebuild projects identified. Exhibit BML-1 provides a description of the Structure Hardening program on page 23. DEF will continue to evaluate Programs and projects in light of its statutory obligation to update its SPP at least once every three years.

37. Provide the number of wood transmission poles replaced in 2020, 2021, and 2022.

Response:

Wood transmission poles replaced in 2020 are identified in the 2020 Storm Protection Plan Annual Status Report, in Section III Initiative 4 filed June 1, 2021 (*available at 2020 Duke Energy Florida, Inc. SPP Annual Status Report.pdf (state.fl.us)*). Wood transmission poles replaced in 2021 as shown in DEF's 2021 true-up filing in Docket No. 20220010-EI (see DEF's response to OPC's POD-24) was a total of 1271. Wood transmission poles projected to be replaced in 2022 are a total of 2180.

38. Provide the actual or projected annual expenditures for the replacement of woodtransmission poles for 2020, 2021 and 2022.

Response:

The 2020 actual expenditure was provided in the 2020 Storm Protection Plan Annual Status Report, Section III in Initiative 4.
The 2021 actual expenditures for the replacement of wood transmission poles as shown in DEF's 2021 true-up filing in Docket No. 20220010-EI (see DEF's response to POD-24) was $64.5M.*
The 2022 projected expenditure for the replacement of transmission poles is approximately $108.7M.

*Note: $34.8M was applied to Base Rates and not recovered through the SPPCRC.

39. Provide the number of distribution poles replaced in 2020, 2021, and 2022.

Response:

The table below provides values for the poles replaced within the Distribution pole replacement program. It does not include poles that were replaced by other hardening efforts such as the Feeder Hardening program as those programs are not tracked on a "pole unit count" basis.

2020	2021	2022 (projected)
2,696	2,251	10125

40. Provide the actual or projected cost to replace distribution poles in 2020, 2021, and 2022.

Response:

2020	2021	2022 Projected
$17,114,765	$17,985,864	$75,607,020

The 2022 Projected value includes pole replacements within the SPP programs of Feeder Hardening and Lateral Hardening as well as those within base rates.

41. Provide the number of distribution poles which were rehabilitated in 2020, 2021, and 2022.

Response:

2020	2021	2022 (projected)
289	294	293

42. Provide the actual or projected cost to rehabilitate distribution poles in 2020, 2021, and 2022.

Response:

	2020	2021	2022
ACTUAL	$-47,599 *	$550,861	$22,116 YTD
PROJECTED			$238,881

* Negative due to reversed accruals from 2019. 2021 includes accruals from 2020 and 2021.

43. Provide the average per pole cost of distribution pole inspections less replacement and rehabilitation costs for 2020, 2021, and 2022.

Response:

2020	2021	2022 YTD
$47.11	$40.54	$38.08

44. Provide actual or projected costs for transmission pole inspection for 2020, 2021, and 2022.

Response:

Annual expenditure for wood transmission pole inspections in 2020 was $387,617 and may be found in the 2020 DEF Storm Protection Plan Annual Status Report, Section V, page 71. (*available at 2020 Duke Energy Florida, Inc. SPP Annual Status Report.pdf (state.fl.us)*
Annual expenditure for wood transmission pole inspections in 2021 was $242,946.
Projected annual expenditure for wood transmission pole inspections in 2022 is approximately $420,000.
The 2022 transmission pole inspections are scheduled for second Quarter of 2022.

45. Provide the number of transmission poles inspected in 2020, 2021, and 2022, broken down by material type: concrete, steel, and wood.

Response:

The 2020 transmission poles inspected are provided in response to Request to Produce 1.17.
The 2021 transmission poles inspected are provided in response to Request to Produce 1.17.

The projected 2022 inspections are: 3,400 for concrete, 5,000 for steel, 300 towers and 1,500 for wood. As part of this program DEF, anticipates inspecting more than the identified structures as efficiency opportunities permit.

46. Provide the average per pole cost of wooden transmission pole inspections less replacement and rehabilitation costs for 2020, 2021, and 2022.

Response:

The average cost per pole for wooden transmission pole inspections less replacement and rehabilitation is:

2020	2021	2022
$38.60	$35.24	$55.52

47. Provide the average per pole cost of steel transmission pole inspections less replacement and rehabilitation costs for 2020, 2021, and 2022.

Response:

The average cost per pole for steel transmission pole inspections less replacement and rehabilitation is:

2020	2021	2022
$13.73	$11.21	$31.50

48. Provide the average per pole cost of concrete transmission pole inspections less replacement and rehabilitation costs for 2020, 2021, and 2022.

Response:

The average cost per pole for concrete transmission pole inspections less replacement and rehabilitation is:

2020	2021	2022
$13.73	$11.21	$31.50

49. Provide the number of concrete transmission poles that failed inspection in 2020, 2021, and 2022.

Response:

The 2020 concrete transmission poles that failed inspection documents are provided in response to Request to Produce 1.17.
The 2021 concrete transmission poles that failed inspection are provided in response to Request to Produce 1.17.
The 2022 transmission pole inspections are scheduled for second Quarter of 2022; therefore no information is available at this time.

50. Provide the number of steel transmission poles that failed inspection in 2020, 2021, and 2022.

Response:

The 2020 steel transmission poles that failed inspection are provided in response to Request to Produce 1.17.
The 2021 steel transmission poles that failed inspection are provided in response to Request to Produce 1.17.
The 2022 transmission pole inspections are scheduled for second Quarter of 2022; therefore no information is available at this time.

51. Explain the function and purpose of the network maintenance and replacement program.

Response:
The purpose of the Network Maintenance and Replacement program is to evaluate DEF's existing downtown underground system within the manhole/vaults to determine what work is required to meet DEF's existing standards. Typical work identified is replacement of primary and secondary conductors; transformers; protectors; and structures.

52. Explain why the self-optimizing grid program is included in both the grid investment projects and storm protection plan.

Response:

The Self-Optimizing Grid program is included in both the grid investment projects and the Storm Protection Plan as the program transitioned from the former at the end of 2021 and was approved under DEF's SPP in Docket 20200069. DEF's SPP 2020, approved in Docket No. 20200069 included programs recovered through base rates and programs recovered through the newly created SPPCRC; the programs previously recovered through base rates were transitioned to recovery through the SPPCRC in 2022 as contemplated by SPP 2020 and DEF's 2021 Rate Settlement Agreement.

53. Explain what process is in place to prevent double counting of the self-optimizing grid investments.

Response:

As addressed on pages 3-4 of Witness Miller's May 3, 2021, testimony in Docket No. 20210010:

"Consistent with Section 366.96, F.S., to ensure "*the annual transmission and distribution storm protection plan costs [do] not include costs recovered through the public utility's base rates*…" the separation of costs subject to recovery through the SPPCRC are identified using the Company's accounting system attributes including Funding Projects and Work Orders. Further, each SPP Project is 'tagged' with an 'SPP' project indicator code in the work order management system, which carries forward to the fixed asset sub-ledger and general ledger. As such, all SPP capital costs can be identified by this unique code which permits their ready identification and verification separate from DEF's base rates or any other cost recovery mechanism.

Each Program that was established through DEF's SPP received unique reporting fields to be selected within DEF's work management system, such as new Process IDs and Job plans. The Job Plan is utilized in the work management system to designate the type of work, as well as key financial information such as the general ledger account and Process ID. The Process ID is used to track the specific Program in the accounting systems. These new reporting fields were created specifically to record the project activities to the SPP Program with which they are associated. For example, the Distribution - Feeder Hardening Program uses Process ID "SPPFDHD", while Distribution - Lateral Hardening Overhead Program uses Process ID "SPPLTOH", to further identify the capital costs specific to each Program. The sum of the activity recorded in each SPP Process ID can be compared to the total amount in the projects tagged with the SPP project indicator code to validate that all SPP costs are identified, and therefore would not be double recovered. "