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April 16, 2020

VIA: ELECTRONIC FILING

Mr. Adam J. Teitzman
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Petition of Tampa Electric Company for Approval of Revisions to Standard Offer
Contract and Rate Schedule COG-2; Dkt. 20200112-EG

Dear Mr. Teitzman

Attached for filing in the above-styled docket are Tampa Electric Company's responses to Staff's First Data Request (Nos. 1-3), as requested on April 6, 2020.

Thank you for your assistance in connection with this matter.

Sincerely,



James D. Beasley

JDB/bmp
Attachment

cc: Damian Kistner, Engineering Specialist (w/attach) DKistner@psc.state.fl.us
Paula Brown
J. Jeffrey Wahlen
Malcolm Means

**TAMPA ELECTRIC COMPANY
DOCKET NO. 20200112-EQ
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1. Please explain the selection of a reciprocating engine, as TECO's next avoided unit, instead of either a combustion turbine or combined cycle unit. As part of your response, describe the benefits and disadvantages of the reciprocating engine selection compared to either of these generating unit types.
 - A. As part of TEC's integrated resource plan, an 18.5 MW reciprocating engine was selected as the next unit in a portfolio of already existing steam and combined cycle generation. It fills an existing reserve margin need in January 2022 and is scheduled to be placed into service in December 2021. Due to their size and scalability, reciprocating engines can more precisely satisfy a reserve margin need without overbuilding.

Reciprocating engines provide many benefits to the TEC portfolio. They are able to be placed closer to customers and can provide increased resiliency and decreased time for storm restoration. Because these engines are able to be placed closer to customer sites, they also decrease transmission and distribution line losses and there by provide fuel savings. The heat rate on a reciprocating engine at approximately 25% better than a combustion turbine peaking unit thus providing further fuel savings to customers.

Another benefit to the TEC portfolio, is that reciprocating engines can provide grid stability by providing voltage support and quick start capability for intermittent renewable resources. Reciprocating engines are able to respond to system needs much quicker than traditional generation like combustion turbines or combined cycle units.

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- 2.** If a renewable provider signs a contract in excess of the installed capacity of the avoided unit (18.5 Megawatts), would TECO seek to limit capacity payments to this amount? Please explain your response.
 - A.** The Standard Offer reflects a resource of a specific size planned to meet Tampa Electric's customers demand and energy needs and help the company maintain its 20 percent firm reserve margin. As renewable capacity and energy providers seek to contract for the Standard Offer, the company would continue to monitor the volume of purchases compared to the size of the avoided unit. When the capacity, be it a single offer or in aggregate, exceeds that of the avoided unit, the company would review all incremental capacity to the identify the amount(s) above the avoided unit capacity that are economic for customers and contract at that level.

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3. Please complete the following table describing payments to a renewable provider based on the proposed tariffs included in the Utility's revised standard offer contract. Please assume a renewable generator with a 50 MW output providing firm capacity with an in-service date of January 1, 2021, operating at the minimum capacity factor required for full capacity payments and a contract duration of 20 years. Please state the capacity factor assumed for the calculations. Please calculate the total Net Present Value (NPV) of all payments in 2021 dollars, and also provide an explanation of the method and rate used to calculate the NPV.

Please provide the completed table for each of the following scenarios:

- a. As-available energy (energy only payments)
- b. Normal capacity payments
- c. Levelized payments
- d. Early payments
- e. Early levelized payments

| Year | Energy (MWh) | Capacity Rate (\$/kw-mo) | Total Capacity Payments (\$) | Energy Rate (\$/MWh) | Total Energy Payments (\$) | Total Payments (\$) |
|------|--------------|--------------------------|------------------------------|----------------------|----------------------------|---------------------|
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |

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| | | | | | | |
|--------------------|--|--|--|--|--|--|
| 2032 | | | | | | |
| 2033 | | | | | | |
| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| Total (nominal) | | | | | | |
| Total (NPV) | | | | | | |

- A.** The payments for capacity and energy from a 50 MW a renewable facility with an in-service date of January 1, 2021 under the various options (i.e., as-available only, standard, levelized, early, and early levelized) are provided in the tables below.

The payments are based on the renewable facility operating at an 80% capacity factor which is the minimum performance standard. The Monthly Capacity Factor for the period April 1st through October 31st shall be defined as the sum of 80% of the Monthly Average On-Peak Operating Factor plus 20% of the Monthly Average Off-peak Operating Factor. The Monthly Capacity Factor for the period November 1st through March 31st shall be defined as the sum of 90% of the Monthly Average On-peak Operating Factor plus 10% of the Monthly Average Off-peak Operating Factor.

To determine if the sums of the payment streams of the various payment methods were equal on a Net Present Value or Net Present Worth basis, the company multiplied the payment in each year by the Present Worth Factor which is calculated as follows:

$$\frac{1}{(1+i)^n}$$

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a.

Where:

**i = discount rate = 6.703 %
n = (payment year – 2021)**

**Payment Type: As-Available (Energy Only)
Committed Capacity: 50 MW
Capacity Factor: 80%**

| Year | Energy | Capacity Rate | Total Capacity Payments | Energy Rate | Total Energy Payments | Total Payments |
|---------------------------|-----------|---------------|-------------------------|-------------|-----------------------|----------------|
| | (MWh) | (\$/kW-mo) | (\$) | (\$/MWh) | (\$) | (\$) |
| 2020 | 351,360 | - | - | 26.72 | 9,387,680 | 9,387,680 |
| 2021 | 350,400 | - | - | 27.16 | 9,515,627 | 9,515,627 |
| 2022 | 350,400 | - | - | 28.49 | 9,983,160 | 9,983,160 |
| 2023 | 350,400 | - | - | 26.93 | 9,437,240 | 9,437,240 |
| 2024 | 351,360 | - | - | 28.81 | 10,123,467 | 10,123,467 |
| 2025 | 350,400 | - | - | 30.78 | 10,786,400 | 10,786,400 |
| 2026 | 350,400 | - | - | 35.21 | 12,338,000 | 12,338,000 |
| 2027 | 350,400 | - | - | 35.28 | 12,360,507 | 12,360,507 |
| 2028 | 351,360 | - | - | 36.98 | 12,992,320 | 12,992,320 |
| 2029 | 350,400 | - | - | 39.18 | 13,728,027 | 13,728,027 |
| 2030 | 350,400 | - | - | 43.18 | 15,129,267 | 15,129,267 |
| 2031 | 350,400 | - | - | 45.01 | 15,770,773 | 15,770,773 |
| 2032 | 351,360 | - | - | 46.72 | 16,414,613 | 16,414,613 |
| 2033 | 350,400 | - | - | 48.05 | 16,836,120 | 16,836,120 |
| 2034 | 350,400 | - | - | 52.41 | 18,363,360 | 18,363,360 |
| 2035 | 350,400 | - | - | 54.65 | 19,149,427 | 19,149,427 |
| 2036 | 351,360 | - | - | 57.04 | 20,039,867 | 20,039,867 |
| 2037 | 350,400 | - | - | 61.73 | 21,631,413 | 21,631,413 |
| 2038 | 350,400 | - | - | 63.53 | 22,259,880 | 22,259,880 |
| 2039 | 350,400 | - | - | 66.01 | 23,129,453 | 23,129,453 |
| 2040 | 351,360 | - | - | 69.54 | 24,433,840 | 24,433,840 |
| Total (Nominal) | 7,364,160 | - | - | | 323,810,440 | 323,810,440 |
| Total NPV (\$2020) | | | | | 179,896,391 | 179,896,391 |

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b.

**Payment Type: Normal
Committed Capacity: 50 MW
Capacity Factor: 80%**

| Year | Energy | Capacity Rate | Total Capacity Payments ⁽¹⁾ | Energy Rate | Total Energy Payments | Total Payments |
|---------------------------|-----------|---------------|--|-------------|-----------------------|----------------|
| | (MWh) | (\$/kW-mo) | (\$) | (\$/MWh) | (\$) | (\$) |
| 2020 | 351,360 | - | - | 26.72 | 9,387,680 | 9,387,680 |
| 2021 | 350,400 | 9.00 | 5,402,945 | 27.16 | 9,515,627 | 14,918,572 |
| 2022 | 350,400 | 9.19 | 5,513,114 | 28.49 | 9,983,160 | 15,496,274 |
| 2023 | 350,400 | 9.38 | 5,625,533 | 26.93 | 9,437,240 | 15,062,773 |
| 2024 | 351,360 | 9.57 | 5,740,247 | 28.81 | 10,123,467 | 15,863,714 |
| 2025 | 350,400 | 9.76 | 5,857,305 | 30.78 | 10,786,400 | 16,643,705 |
| 2026 | 350,400 | 9.96 | 5,976,753 | 35.21 | 12,338,000 | 18,314,753 |
| 2027 | 350,400 | 10.16 | 6,098,640 | 35.28 | 12,360,507 | 18,459,147 |
| 2028 | 351,360 | 10.37 | 6,223,017 | 36.98 | 12,992,320 | 19,215,337 |
| 2029 | 350,400 | 10.58 | 6,349,935 | 39.18 | 13,728,027 | 20,077,962 |
| 2030 | 350,400 | 10.80 | 6,479,445 | 43.18 | 15,129,267 | 21,608,712 |
| 2031 | 350,400 | 11.02 | 6,611,600 | 45.01 | 15,770,773 | 22,382,374 |
| 2032 | 351,360 | 11.24 | 6,746,455 | 46.72 | 16,414,613 | 23,161,069 |
| 2033 | 350,400 | 11.47 | 6,884,065 | 48.05 | 16,836,120 | 23,720,185 |
| 2034 | 350,400 | 11.71 | 7,024,486 | 52.41 | 18,363,360 | 25,387,846 |
| 2035 | 350,400 | 11.95 | 7,167,776 | 54.65 | 19,149,427 | 26,317,202 |
| 2036 | 351,360 | 12.19 | 7,313,993 | 57.04 | 20,039,867 | 27,353,859 |
| 2037 | 350,400 | 12.44 | 7,463,197 | 61.73 | 21,631,413 | 29,094,610 |
| 2038 | 350,400 | 12.69 | 7,615,450 | 63.53 | 22,259,880 | 29,875,330 |
| 2039 | 350,400 | 12.95 | 7,770,813 | 66.01 | 23,129,453 | 30,900,267 |
| 2040 | 351,360 | 13.22 | 7,929,351 | 69.54 | 24,433,840 | 32,363,191 |
| Total (Nominal) | 7,364,160 | | 131,794,120 | | 323,810,440 | 455,604,560 |
| Total NPV (\$2020) | | | 65,718,060 | | 179,896,391 | 245,614,451 |

(1) The capacity payment under the Normal payment option begins December 1st of 2021 which is the in-service date of the avoided unit.

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C.

Payment Type: Levelized
Committed Capacity: 50 MW
Capacity Factor: 80%

| Year | Energy | Capacity Rate | Total Capacity Payments ⁽¹⁾ | Energy Rate | Total Energy Payments | Total Payments |
|---------------------------|------------------|---------------|--|-------------|-----------------------|--------------------|
| | (MWh) | (\$/kW-mo) | (\$) | (\$/MWh) | (\$) | (\$) |
| 2020 | 351,360 | - | - | 26.72 | 9,387,680 | 9,387,680 |
| 2021 | 350,400 | 9.78 | 5,867,128 | 27.16 | 9,515,627 | 15,382,755 |
| 2022 | 350,400 | 9.82 | 5,890,338 | 28.49 | 9,983,160 | 15,873,498 |
| 2023 | 350,400 | 9.86 | 5,914,059 | 26.93 | 9,437,240 | 15,351,299 |
| 2024 | 351,360 | 9.90 | 5,938,301 | 28.81 | 10,123,467 | 16,061,768 |
| 2025 | 350,400 | 9.94 | 5,963,077 | 30.78 | 10,786,400 | 16,749,477 |
| 2026 | 350,400 | 9.98 | 5,988,398 | 35.21 | 12,338,000 | 18,326,398 |
| 2027 | 350,400 | 10.02 | 6,014,276 | 35.28 | 12,360,507 | 18,374,783 |
| 2028 | 351,360 | 10.07 | 6,040,723 | 36.98 | 12,992,320 | 19,033,043 |
| 2029 | 350,400 | 10.11 | 6,067,752 | 39.18 | 13,728,027 | 19,795,779 |
| 2030 | 350,400 | 10.16 | 6,095,376 | 43.18 | 15,129,267 | 21,224,643 |
| 2031 | 350,400 | 10.21 | 6,123,608 | 45.01 | 15,770,773 | 21,894,381 |
| 2032 | 351,360 | 10.25 | 6,152,460 | 46.72 | 16,414,613 | 22,567,074 |
| 2033 | 350,400 | 10.30 | 6,181,947 | 48.05 | 16,836,120 | 23,018,067 |
| 2034 | 350,400 | 10.35 | 6,212,083 | 52.41 | 18,363,360 | 24,575,443 |
| 2035 | 350,400 | 10.40 | 6,242,883 | 54.65 | 19,149,427 | 25,392,309 |
| 2036 | 351,360 | 10.46 | 6,274,359 | 57.04 | 20,039,867 | 26,314,226 |
| 2037 | 350,400 | 10.51 | 6,306,528 | 61.73 | 21,631,413 | 27,937,942 |
| 2038 | 350,400 | 10.57 | 6,339,405 | 63.53 | 22,259,880 | 28,599,285 |
| 2039 | 350,400 | 10.62 | 6,373,005 | 69.54 | 24,367,081 | 30,740,086 |
| 2040 | 351,360 | 10.68 | 6,407,344 | - | - | 6,407,344 |
| Total (Nominal) | 7,364,160 | | 122,393,054 | | 300,614,228 | 423,007,281 |
| Total NPV (\$2020) | | | 65,718,064 | | 179,896,391 | 245,614,455 |

(1) The capacity payment under the Normal payment option begins December 1st of 2021 which is the in-service date of the avoided unit.

d. n/a Due to in service date of January 2021.

e. n/a Due to in service date of January 2021.