



Matthew R. Bernier
ASSOCIATE GENERAL COUNSEL

May 18, 2020

VIA OVERNIGHT MAIL

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

Re: *Fuel and purchased power cost recovery clause with generating performance
incentive factor; Docket No. 20200001-EI*

Dear Mr. Teitzman:

Please find enclosed for electronic filing on behalf of Duke Energy Florida, LLC ("DEF"), DEF's Request for Confidential Classification filed in connection with certain information provided in the 2020 Recommended Order from the State of Florida Division of Administrative Hearings, where the final hearing was conducted on February 4-5, 2020. The filing includes the following:

- DEF's Request for Confidential Classification
- Exhibit A (Slip Sheet for Confidential Documents)
- Exhibit B (two redacted copies)
- Exhibit C (Justification Matrix), and
- Exhibit D (affidavit of Jeffrey Swartz)

DEF's confidential Exhibit A that accompanies the above-referenced filing has been submitted under separate cover.

Thank you for your assistance in this matter. Please feel free to call me at (850) 521-1428 should you have any questions concerning this filing.

Respectfully,

/s/ Matthew R. Bernier

Matthew R. Bernier

MRB/cmw
Enclosures

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Fuel and purchased power cost recovery
Clause with generating performance incentive
Factor

Docket No. 20200001-EI

Filed: May 18, 2020

**DUKE ENERGY FLORIDA, LLC'S
REQUEST FOR CONFIDENTIAL CLASSIFICATION**

Duke Energy Florida, LLC, (“DEF” or “Company”), pursuant to Section 366.093, Florida Statutes (F.S.), and Rule 25-22.006, Florida Administrative Code (F.A.C.), submits this Request for Confidential Classification for certain information provided in the 2020 Recommended Order from the State of Florida Division of Administrative Hearings, where the final hearing was conducted on February 4-5, 2020. This Request is timely. *See* Rule 25-22.006(3)(a)1, F.A.C. In support of this Request, DEF states:

The 2020 Recommended Order from the State of Florida Division of Administrative Hearings contains “proprietary confidential business information” under § 366.093(3), Florida Statutes.

1. The following exhibits are included with this request:

(a) Sealed Composite Exhibit A is a package containing an unredacted copy of all the documents for which DEF seeks confidential treatment. In the unredacted version, the information asserted to be confidential is highlighted in yellow.

(b) Composite Exhibit B is a package containing two copies of redacted versions of the documents for which the Company requests confidential classification, or slip-sheets for documents which are confidential in their entirety. The specific information for which confidential treatment is requested has been blocked out by opaque marker or other means.

(c) Exhibit C is a table which identifies the information for which DEF seeks confidential classification and the specific statutory bases for seeking confidential treatment.

(d) Exhibit D is an affidavit attesting to the confidential nature of information identified in this request.

2. As indicated in Exhibit C, the information for which DEF requests confidential classification is “proprietary confidential business information” within the meaning of § 366.093(3), F.S. DEF is requesting confidential classification of this information because it contains contractual information or information provided by a third party that DEF is obligated to keep confidential, the disclosure of which would harm its competitive business interest and ability to contract for goods or services on favorable terms. *See* §§ 366.093(3)(d) & (e), F.S.; Affidavit of Jeffrey Swartz at ¶¶ 3, 4 and 5. Accordingly, such information constitutes “proprietary confidential business information” which is exempt from disclosure under the Public Records Act pursuant to § 366.093(1), F.S.

3. In order to contract with third-party vendors and Original Equipment Manufacturers on favorable terms, DEF must keep contractual terms and third-party proprietary information confidential. The disclosure of which would be to the detriment of DEF and its customers. Additionally, the disclosure of confidential information provided by a third party could adversely impact DEF’s competitive business interests. If such information was disclosed to DEF’s competitors, DEF’s efforts to obtain competitive contracts that add economic value to both DEF and its customers could be undermined. *See* Affidavit of Swartz at ¶¶ 4 and 5. *Id.*

4. The information identified as Exhibit “A” is intended to be and is treated as confidential by the Company. *See* Affidavit of Swartz at ¶¶ 4 and 6. The information has not

been disclosed to the public, and the Company and third-party vendors have treated and continue to treat this information as confidential. *Id.*

5. DEF requests that the information identified in Exhibit A be classified as “proprietary confidential business information” within the meaning of § 366.093(3), F.S., that the information remains confidential for a period of at least 18 months as provided in § 366.093(4) F.S., and that the information be returned as soon as it is no longer necessary for the Commission to conduct its business.

WHEREFORE, for the foregoing reasons, DEF respectfully requests that this Request for Confidential Classification be granted.

RESPECTFULLY SUBMITTED this 18th day of May, 2020.

/s/ Matthew R. Bernier

DIANNE M. TRIPLETT

Deputy General Counsel
Duke Energy Florida, LLC
299 First Avenue North
St. Petersburg, FL 33701
T: 727.820.4692
F: 727.820.5041

E: Dianne.Triplett@Duke-Energy.com

MATTHEW R. BERNIER

Associate General Counsel
Duke Energy Florida, LLC
106 E. College Avenue, Suite 800
Tallahassee, FL 32301
T: 850.521.1428
F: 727.820.5041

E: Matt.Bernier@Duke-Energy.com

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished via electronic mail to the following this 18th day of May, 2020.

/s/ Matthew R. Bernier

Attorney

<p>Suzanne Brownless Office of General Counsel FL Public Service Commission 2540 Shumard Oak Blvd. Tallahassee, FL 32399-0850 sbrownle@psc.state.fl.us</p> <p>J. Beasley / J. Wahlen / M. Means Ausley McMullen P.O. Box 391 Tallahassee, FL 32302 jbeasley@ausley.com jwahlen@ausley.com mmeans@ausley.com</p> <p>Steven Griffin Beggs & Lane P.O. Box 12950 Pensacola, FL 32591 srg@beggslane.com</p> <p>Russell A. Badders Gulf Power Company One Energy Place Pensacola, FL 32520 russell.badders@nexteraenergy.com</p> <p>Holly Henderson Gulf Power Company 215 S. Monroe St., Ste. 618 Tallahassee, FL 32301 holly.henderson@nexteraenergy.com</p> <p>Kenneth A. Hoffman Florida Power & Light Company 134 W. Jefferson Street Tallahassee, FL 32301-1713 ken.hoffman@fpl.com</p> <p>Jon C. Moyle, Jr. Moyle Law Firm, P.A. 118 North Gadsden Street Tallahassee, FL 32301 jmoyle@moylelaw.com mqualls@moylelaw.com</p>	<p>J.R. Kelly / P. Christensen / T. David / S. Morse Office of Public Counsel 111 W. Madison St., Room 812 Tallahassee, FL 32399-1400 kelly.jr@leg.state.fl.us christensen.patty@leg.state.fl.us david.tad@leg.state.fl.us morse.stephanie@leg.state.fl.us</p> <p>Ms. Paula K. Brown Regulatory Affairs Tampa Electric Company P.O. Box 111 Tampa, FL 33601-0111 regdept@tecoenergy.com</p> <p>Maria Moncada / Joel Baker Florida Power & Light Company 700 Universe Blvd. (LAW/JB) Juno Beach, FL 33408-0420 maria.moncada@fpl.com joel.baker@fpl.com</p> <p>James Brew / Laura Wynn Stone Law Firm 1025 Thomas Jefferson St., N.W. Suite 800 West Washington, DC 20007 jbrew@smxblaw.com law@smxblaw.com</p> <p><u>Mike Cassel</u> Florida Public Utilities Company 1750 S. 14th Street, Suite 200 Fernandina Beach, FL 32034 mcassel@fpuc.com</p> <p>Beth Keating Gunster, Yoakley & Stewart, P.A. 215 South Monroe Street, Suite 601 Tallahassee, FL 32301 bkeating@gunster.com</p>
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Exhibit A

CONFIDENTIAL

(Slip Sheet)

Exhibit B
(Two Copies)

REDACTED

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: FUEL AND PURCHASED POWER
COST RECOVERY CLAUSE WITH
GENERATING PERFORMANCE INCENTIVE
FACTOR,

Case No. 19-6022

RECOMMENDED ORDER

Pursuant to notice, a final hearing was conducted in this case on February 4 and 5, 2020, in Tallahassee, Florida, before Lawrence P. Stevenson, a duly-designated Administrative Law Judge (“ALJ”) of the Division of Administrative Hearings (“DOAH”).

APPEARANCES

For Duke Energy Florida, LLC (“DEF”¹):

Diane M. Triplett, Esquire
Duke Energy Florida, LLC
299 First Avenue North
St. Petersburg, Florida 33701

Matthew Bernier, Esquire
Duke Energy Florida, LLC
106 East College Avenue, Suite 800
Tallahassee, Florida 32301

Daniel Hernandez, Esquire
Shutts & Bowen, LLP
4301 West Boy Scout Boulevard, Suite 300
Tampa, Florida 33607

¹ References to DEF include Progress Energy, DEF’s predecessor in interest in the Bartow power plant that is the subject of this proceeding. DEF purchased Progress Energy in 2011.

For the Public Service Commission (the “Commission”):

Suzanne Smith Brownless, Esquire
Bianca Y. Lherisson, Esquire
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32339-0850

For the Office of Public Counsel (“OPC”):

James Ray Kelly, Public Counsel
Charles John Rehwinkel, Deputy Public Counsel
Thomas A. (Tad) David, Esquire
Patty Christensen, Esquire
Stephanie Morse, Esquire
Office of Public Counsel
111 West Madison Street, Room 812
Tallahassee, Florida 32399-1400

For Florida Industrial Power Users Group (“FIPUG”):

Jon C. Moyle, Jr., Esquire
Karen Ann Putnal, Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301

For White Springs Agricultural Chemicals, Inc., d/b/a PCS Phosphate—
White Springs (“White Springs”):

James Walter Brew, Esquire
Stone Law Firm
Eighth Floor, West Tower
1025 Thomas Jefferson Street Northwest
Washington, DC 20007

STATEMENT OF THE ISSUES

Two issues have been referred by the Commission to DOAH for a
disputed-fact hearing:

ISSUE 1B: Was DEF prudent in its actions and decisions leading up to
and in restoring the unit to service after the February 2017 forced outage at

the Bartow plant and, if not, what action should the Commission take with respect to replacement power costs?

ISSUE 1C: Has DEF made prudent adjustments, if any are needed, to account for replacement power costs associated with any impacts related to the de-rating of the Bartow plant? If adjustments are needed and have not been made, what adjustment(s) should be made?

PRELIMINARY STATEMENT

On January 2, 2019, the Commission opened Docket No. 20190001-EI, *In re: Fuel and purchased power cost recovery clause with generating performance incentive factor*, commonly referred to as the “Fuel Clause” docket. The Fuel Clause docket is a recurring, annual docket to which all investor-owned electric utilities serving customers in Florida are parties. Through the Fuel Clause docket, utilities are permitted to recover reasonably and prudently incurred costs of the fuel and fuel-related activities needed to generate electricity. Among the issues raised in the 2019 Fuel Clause docket was DEF’s request to recover the replacement power costs incurred in connection with an unplanned outage to the steam turbine at DEF’s Bartow Unit 4 combined cycle power plant (the “Bartow Plant”) in February 2017. Issues 1B and 1C were raised as part of the 2019 Fuel Clause docket.

On November 5, 2019, the Commission held a final hearing in the 2019 Fuel Clause docket. All issues related to DEF’s request to recover its fuel and purchased power costs were addressed, except for Issues 1B and 1C. Both Issues 1B and 1C involved extensive claims of confidentiality with respect to the pre-filed testimony of DEF witness Jeffrey Swartz, OPC witness Richard Polich, and the proposed trial exhibits.

The Commission found that it was impracticable to conduct direct or cross-examination in an open hearing without extensive reference to

confidential material. Despite its apparent authority under section 366.093, Florida Statutes, to declare documents confidential, the Commission took the position that it lacked authority to close a public hearing to protect materials and topics it had previously determined to be confidential. The Commission therefore referred Issues 1B and 1C to DOAH for a closed evidentiary hearing and issuance of a Recommended Order.

On November 26, 2019, a telephonic status conference was held to set hearing dates, establish the procedures for handling confidential material, the need for discovery, the use of written testimony, and the use of the Comprehensive Exhibit List (“CEL”) admitted into evidence at the Commission’s November 5, 2019, hearing. At the status conference, the parties agreed to the hearing dates of February 4 and 5, 2020. The undersigned requested the parties to confer and file a motion setting forth proposed procedures for the handling of confidential material before, during, and after the hearing. The parties filed a Joint Motion on Confidentiality on December 6, 2019, which was adopted by Order issued December 9, 2019.

On December 23, 2019, the Commission’s record was transmitted to DOAH on two CD-ROM discs. Disc One contained non-confidential information and Disc Two contained information held as confidential.

The final hearing was convened and completed as scheduled on February 4 and 5, 2020. At the outset of the hearing, the parties submitted an updated CEL from the November 2019 proceeding before the Commission. The revised CEL listed 114 exhibits. The revised CEL was numbered as Exhibit 114 and admitted by stipulation.

DEF presented the direct and rebuttal testimony of Jeffrey R. Swartz, its Vice President of Generation. DEF moved for the admission of Exhibits 80 through 82, which were admitted into the record.

OPC presented the testimony of Richard Polich, an engineer with expertise in the design of power generation systems, including steam turbines. OPC moved for the admission of Exhibits 68 through 75 and 101 through 109, which were admitted into the record. At the hearing, OPC Exhibits 115 through 117 were marked, moved, and admitted into the record.

The Commission moved for the admission of Exhibits 110 and 111, which were admitted into the record.

FIPUG moved for the admission of Exhibit 118, which was admitted into the record.

White Springs moved for the admission of Exhibits 112 and 113, which were admitted into the record.

The three-volume Transcript of the final hearing was filed with DOAH on February 24, 2020. Pursuant to an agreement approved by the undersigned, the parties timely filed their Proposed Recommended Orders on March 20, 2020. DEF and the Commission filed separate Proposed Recommended Orders. OPC, FIPUG, and White Springs submitted a joint Proposed Recommended Order (unless otherwise specified, references to OPC as to positions stated in its Proposed Recommended Order should be understood to include FIPUG and White Springs). All three Proposed Recommended Orders have been duly considered in the writing of this Recommended Order.

Unless otherwise indicated, statutory references are to the 2019 edition of the Florida Statutes.

FINDINGS OF FACT

Based on the evidence adduced at hearing, and the record as a whole, the following Findings of Fact are made:

THE PARTIES

1. The Commission is the state agency authorized to implement and enforce Chapter 366, Florida Statutes, which governs the regulation of every “public utility” as defined in section 366.02(1).

2. DEF is a public utility and is therefore subject to the Commission’s jurisdiction. DEF is a subsidiary of Duke Energy, one of the largest energy holding companies in the United States.

3. OPC is statutorily authorized to represent the citizens of the state of Florida in matters before the Commission, and to appear before other state agencies in connection with matters under the Commission’s jurisdiction. § 350.0611(1), (3), and (5), Fla. Stat.

4. FIPUG is an association comprising large commercial and industrial power users within Florida. A substantial number of FIPUG’s members are customers of DEF.

5. White Springs operates energy intensive phosphate mining and processing facilities in Hamilton County and is one of DEF’s largest industrial customers.

THE BARTOW PLANT

6. The Bartow Plant is a 4x1 combined cycle power plant composed of combustion turbine generators whose waste heat is used to produce steam that powers a steam turbine manufactured by Mitsubishi Hitachi Power Systems (“Mitsubishi”). “4x1” references the fact that there are four Siemens

180 megawatt (“MW”) Type 501 F combustion turbines, each connected to one of four heat recovery steam generators (“HRSG”), all of which in turn are connected to one steam turbine.

7. A combined cycle power plant uses gas and steam turbines together to produce electricity. Combustion of natural gas in the combustion turbine turns a generator that produces electricity. The waste heat from the combustion turbine is routed to an HRSG. The HRSG produces steam that is then routed to the steam turbine which, in turn, generates extra power.

8. Combined cycle plants can be set up in multiple configurations, providing considerable operational flexibility and efficiency. It is not necessary for all four HRSGs to provide steam to the steam turbine at the same time. The Bartow Plant can operate on all possible configurations of 4x1, i.e., 1x1, 2x1, 3x1, or 4x1. It also has the ability to augment heat through the use of duct burners. The combustion turbines can operate in “simple cycle” mode to generate electricity when the steam turbine is off-line.

9. The steam turbine is made up of a high pressure (“HP”)/intermediate pressure (“IP”) section and a low-pressure (“LP”) section. Each of these turbine sections has a series of blades. As the steam passes through the blades, the steam exerts its force to turn the blades which, in their turn, cause a rotor to spin. The rotor is connected to a generator, and the generator produces electricity.

10. Steam leaving the HRSGs is introduced to the steam turbine at a high-pressure inlet into the HP turbine. The steam is returned to the HRSG for reheating, then enters the IP turbine. Finally, steam exiting the IP turbine is directed into the LP turbine.

11. The LP section of the steam turbine is dual-flow. The steam is admitted in the middle and flows axially in opposite directions through two opposing mirror-image turbine sections, each of which contains four sets of blades. After passing through the LP section, the steam exhausts into a condenser.

12. The sets of blades increase in size from the front to the back of the LP section. The blades get longer as the steam flows through the turbine. The steam loses energy as it passes through the machine and thus more surface area of blade is needed for the weaker steam to produce the force needed to spin the rotor. The final stage of blades in the LP section consists of 40" L-0 blades, the longest blades in the steam turbine.

13. [REDACTED]

14. The Mitsubishi steam turbine was originally designed for Tenaska Power Equipment, LLC ("Tenaska"), to be used in a 3x1 combined cycle configuration with three M501 Type F combustion turbines connected to the steam turbine with a gross output of 420 MW of electricity. For reasons unexplored at the hearing, Tenaska never took delivery of the turbine. It was stored in a Mitsubishi warehouse under controlled conditions that kept it in like-new condition.

15. During the design and planning process for the Bartow Plant, DEF's employees responsible for obtaining company approval to build the plant, reported to senior executives that they had found this already-built steam turbine. The Business Analysis Package of DEF's project authorization documents stated that the Mitsubishi steam turbine "proved to be a very good fit for the 4 CT and 4 HRSG combinations."

16. Prior to purchasing the steam turbine, DEF contracted with Mitsubishi to evaluate the design conditions to ensure the steam turbine was compatible with the Bartow Plant's proposed 4x1 combined cycle configuration. [REDACTED]

[REDACTED]

24. Mr. Swartz further asserted that, prior to completion of the Purchase Agreement, Mitsubishi understood that DEF intended to operate the steam turbine in a 4x1 configuration with a power factor exceeding [REDACTED] which would result in the generation of more than 420 MW of electrical output.

25. Section 3.2 of the Purchase Agreement, titled [REDACTED] states, in relevant part:

[REDACTED]

26. The plain language of section 3.2.1 establishes [REDACTED]

² MPS stands for Mitsubishi Power Systems, Inc.

[REDACTED] It is unclear how Mr. Swartz translated this language into a [REDACTED]

27. In any event, the parties disagree as to the significance of the 420 MW maximum output designation. DEF and the Commission contend that the designated megawatt capacity of a steam turbine is not a control mechanism or a limit that the operator must stay below, but is the byproduct of operating the unit within the design parameters provided by the manufacturer at various combinations of such factors as steam flows, steam temperatures, steam pressures, exhaust pressures, ambient temperatures, and humidity.

28. DEF and the Commission contend that the numbers stated in the [REDACTED] are calculated estimates of the conditions that will achieve [REDACTED]

[REDACTED] output. If DEF was able in practice to operate the steam turbine within the design parameters and achieve output in excess of [REDACTED] then it was simply delivering maximum value to its ratepayers.

29. OPC asserts 420 MW is an operational limitation. [REDACTED]

[REDACTED] OPC points out that Mitsubishi conducted extensive [REDACTED] (from December 2014 until April 2016) that resulted in a document titled, [REDACTED] [REDACTED] dated March 18, 2015 (the "Report"). The Report expressly stated that the [REDACTED]

[REDACTED] The Report also stated that the [REDACTED] [REDACTED] These statements were supported by section 3.2.1.2 of the Purchase Agreement, which states that [REDACTED] [REDACTED] of the steam turbine.

30. OPC points out that section 4.1 of the Purchase Agreement, titled [REDACTED]

[REDACTED] expressly states: [REDACTED]

[REDACTED]

31. OPC notes that [REDACTED] reached [REDACTED] of output using only [REDACTED]. OPC further notes that the Bartow Plant had a [REDACTED] meaning that it had the ability to produce [REDACTED] of output when compared to the [REDACTED] for which the steam turbine was originally designed.

32. The Mitsubishi steam turbine converts steam energy into rotational force (horsepower) that in turn drives an electric generator. The generator purchased by DEF for the Bartow Plant that was attached to the Mitsubishi steam turbine was manufactured by a different vendor and is rated at 468 MW. The generator thus was capable of reliably producing more electrical output than Mitsubishi stated its steam turbine was designed to supply.

33. The greater weight of the evidence establishes that the Mitsubishi steam turbine was designed to operate at 420 MW of output and that 420 MW was an operational limitation of the turbine.

OUTAGES AND BLADE FAILURES

34. DEF has classified the periods during which the Bartow Plant has been operational as: Period 1-- from June 2009 until March 2012; Period 2-- from April 2012 until August 2014; Period 3-- from December 2014 until April 2016; Period 4-- from May 2016 until October 2016; and Period 5-- from December 2016 until February 2017.

35. DEF placed the Bartow Plant into commercial service in June 2009. Later that year, DEF began operating the steam turbine above 420 MW

under varying system conditions. Mr. Swartz estimated that DEF operated the steam turbine above 420 MW about half the time between June 2009 and March 2012, the time span that has been designated as Period 1 of the five periods in question in this proceeding. The Bartow Plant operated for a total of 21,734 hours during Period 1.

36. In March 2012, while conducting a routine inspection of the steam turbine during a planned power outage, DEF found that [REDACTED]
[REDACTED]
[REDACTED] DEF consulted with Mitsubishi regarding the damage. Mitsubishi inspected the blades and recommended [REDACTED]
[REDACTED]

37. Mitsubishi concluded that the damage to the blades was caused by [REDACTED]
[REDACTED]
[REDACTED] Up to this point, Mitsubishi had [REDACTED]
[REDACTED] DEF and Mitsubishi had assumed that if [REDACTED]
[REDACTED] of the steam turbine, then the [REDACTED]
[REDACTED] would be acceptable. After discovery of the blade failure in March 2012, [REDACTED]
[REDACTED]
[REDACTED]³

38. Period 2 commenced in April 2012 and ended in August 2014, a period of 28 months. At the beginning of Period 2, DEF and Mitsubishi replaced all of the L-0 blades on the affected end of the LP turbine with [REDACTED]
[REDACTED]

39. During Period 2, DEF operated the steam turbine a total of 21,284 hours. For all but two hours of this period, DEF operated the steam turbine

³ [REDACTED]
[REDACTED]

at less than 420 MW and complied with Mitsubishi's [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

40. During a planned outage beginning in August 2014, Mitsubishi replaced the [REDACTED] used in Period 2 with [REDACTED] [REDACTED] thus beginning Period 3. During this planned outage, DEF and Mitsubishi conducted an inspection of the Period 2 [REDACTED] blades. The inspection revealed a [REDACTED] consistent with ordinary usage over the course of Period 2. There was no damage noted to [REDACTED]. There was some [REDACTED] described as [REDACTED].

41. Between Period 2 and Period 3, Mitsubishi and DEF installed [REDACTED] in the steam turbine to allow for [REDACTED] which they expected would help them to understand why the L-0 blades were experiencing damage and to [REDACTED] [REDACTED] protect the equipment.

42. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 2.

43. Period 3 commenced in December 2014 and ended in April 2016. During Period 3, DEF operated the steam turbine a total of 10,286 hours. DEF never exceeded 420 MW of output, except for a [REDACTED]
[REDACTED]
[REDACTED]

44. During Period 3, Mitsubishi [REDACTED] on the steam turbine. The [REDACTED]

calculated that the Bartow steam turbine experienced approximately [REDACTED] and Mitsubishi's fleet experience had been [REDACTED] on last stage blades including the 40" L-0 blades. Mitsubishi was uncertain what impact the L-0 blades would experience at [REDACTED]

45. Mitsubishi concluded that [REDACTED]

[REDACTED]

46. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 3.

47. Despite DEF's having [REDACTED]

[REDACTED] DEF and Mitsubishi's examination of the steam turbine at the end of Period 3 revealed that [REDACTED]

[REDACTED] DEF and Mitsubishi decided that [REDACTED] [REDACTED] were installed.

48. Period 4 commenced in June 2016 and ended five months later in October 2016. During Period 4, DEF operated the steam turbine a total of 2,942 hours. DEF did not exceed 420 MW of output during this period and [REDACTED]

49. Just five months after the commencement of Period 4, DEF detected vibration changes in the LP turbine and stopped operation of the steam turbine to inspect the L-0 blades. During this inspection, DEF and Mitsubishi once again found several damaged L-0 blades. At the time of this blade damage, DEF was operating the steam turbine below 420 MW and observing the operating parameters established by Mitsubishi [REDACTED]

50. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 4.

51. Period 5 began in December 2016 and ended two months later in February 2017.

52. At the beginning of Period 5, DEF and Mitsubishi [REDACTED]

[REDACTED]

[REDACTED] of 1,561 hours. DEF never exceeded 420 MW of output during this period and operated the steam turbine within the operating parameters established by Mitsubishi [REDACTED]

54. On February 9, 2017, the steam turbine was removed from service when DEF detected the presence of sodium in the steam water cycle. The cooling water used for the condenser is salt water from Tampa Bay. Mr. Swartz testified that any indication of sodium inside the condenser above minute amounts is alarming. During this shutdown, DEF performed an inspection of the steam turbine and discovered that a [REDACTED]

device known as a rupture disk had failed in the LP turbine and that the L-0 blades were damaged. DEF concluded that [REDACTED] the rupture disk. This forced outage lasted until April 8, 2017.

55. Based on the sequence of events, DEF was able to determine with certainty that the blade damage during Period 5 occurred on February 9, 2017. At that time, DEF was operating the steam turbine below 420 MW and within the operating parameters established by Mitsubishi [REDACTED]

56. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 5.

57. During the February 2017 forced outage of the steam turbine, DEF continued to operate the Bartow Plant with the gas turbines running in simple cycle mode.

58. DEF took three primary actions in the wake of the Period 5 outage: a root cause analysis ("RCA") team, established after the first blade failure in Period 1, continued its mission to investigate and prepare an RCA; a restoration team was formed to bring the steam turbine back online; and a team was formed to evaluate a long-term solution for the steam turbine.

[REDACTED]
[REDACTED]
[REDACTED]

60. Instead, DEF and Mitsubishi installed pressure plates in place of the L-0 blades as an interim solution that would bring the steam turbine back into operation quickly and give Mitsubishi and DEF time to develop a permanent solution. A pressure plate is a non-rotating plate that has holes drilled into it. The pressure plate reduces the pressure of the steam passing through a steam turbine, keeping the steam from damaging the unit's condenser. A pressure plate does not use the steam passing through it to produce electricity and therefore decreases the efficiency of a steam turbine.

The pressure plate applied by DEF limited the output of the steam turbine to 380 MW.

61. The parties have agreed and the undersigned accepts that the period of the steam turbine's "de-rating" from 420 MW to 380 MW should be calculated as running from April 2017 through the end of September 2019.

THE MITSUBISHI AND DEF ROOT CAUSE ANALYSES

62. Mitsubishi's [REDACTED] during Period 3 [REDACTED]

[REDACTED]

[REDACTED] of its RCA in a 35-page "Bartow RCA Summary" ("Mitsubishi RCA"). The Mitsubishi RCA documented the [REDACTED]

[REDACTED]

64. The Mitsubishi RCA also stated that an [REDACTED]

65. After the discovery of the blade damage in March 2012, DEF formed an RCA team and began a years-long RCA process that ended with its own February 6, 2018, RCA report (“DEF RCA”).

66. DEF’s RCA [REDACTED]

67. [REDACTED]

team produced between 2012 and the final DEF RCA in February 2018. Mr. Swartz declined to call these documents “drafts” of the RCA, preferring to say they were “working papers” that provided snapshots of the RCA team’s investigation at a given time. Mr. Swartz emphasized that only the February 2018 RCA report stated DEF’s official position as to the cause of the blade failures.

69. The working papers indicate that as late as October 15, 2016, DEF

70. The working papers show that as late as June 26, 2017, DEF maintained that one of “the most significant contributing factors toward root

cause of the history of Bartow Unit 4 L-0 events” was [REDACTED]

71. OPC accurately states that the DEF working documents demonstrate that during the RCA process, before and after the Period 5 event, DEF consistently identified excessive steam flow in the LP turbine as one of the “most significant contributing factors” toward blade failure over the history of the steam turbine, the [REDACTED].

72. Mr. Swartz attempted to minimize the significance of the working papers by stating that DEF was obliged to investigate the issue of excessive steam flow because [REDACTED]

73. DEF’s final RCA did not include a statement that excessive steam flow was a significant contributing factor in the blade failures. The final DEF RCA instead noted that “excessive steam flow” had been a “potential” operational factor that DEF examined during the RCA process. The RCA states that DEF had been unable to find a correlation between [REDACTED] and the five failure periods. In particular, the RCA pointed out that [REDACTED]

74. OPC concludes that the final DEF RCA was DEF’s self-serving attempt to exonerate its own overloading of the steam turbine and to shift responsibility onto Mitsubishi for [REDACTED] DEF contends that it simply followed the data throughout the RCA process and arrived at the only conclusion consistent with the findings of its engineers.

POST-RCA ACTIONS

75. As noted above, pressure plates were installed in place of the L-0 blades at the conclusion of Period 5. The pressure plates allowed DEF to keep the steam turbine running at a lower level of output while it sought a permanent solution to the blade damage problem.

76. In 2018, DEF solicited proposals to implement a long-term solution that would allow it to reliably operate the steam turbine to support 450 MW of electrical output from the generator. Three vendors responded. [REDACTED]

[REDACTED] DEF selected the Mitsubishi proposal.

77. In December 2019, Mitsubishi installed [REDACTED]

[REDACTED] As of the hearing date, DEF had operated the Bartow Plant with the [REDACTED] L-0 blades without incident on a 1x1, 2x1, and 3x1 configuration, but had yet to operate with all four combustion turbines.

78. OPC points out that in proposing its [REDACTED] blades, Mitsubishi did not waver from the conclusion of its RCA. Mitsubishi stated the following as the first three bullet points in the introduction to its paper describing the testing of the [REDACTED] blades:

[REDACTED]

[REDACTED]

[REDACTED]

REPLACEMENT POWER AND DE-RATING COSTS

79. The record evidence established that the replacement power costs stemming from the February 2017 outage are \$11.1 million.

80. Further, the record evidence established that DEF incurred replacement power costs from May 2017 through September 2019, the period of the “de-rating” of the steam turbine, i.e., the reduction in output from 420 MW to 380 MW while it operated with the pressure plate. Those costs, calculated by year, are \$1,675,561 (2017), \$2,215,648 (2018), and \$1,125,573 (2019), for a total of \$5,016,782.

81. Therefore, the total replacement power costs incurred as a result of DEF’s operation of the steam turbine are \$16,116,781, without considering interest.

DISCUSSION

82. As noted above, the parties have a fundamental disagreement as to the significance of the 420 MW maximum output designation that Mitsubishi placed on the steam turbine. The Energy Information Administration of the U.S. Department of Energy defines “generator nameplate capacity” as the “maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer.” There was no dispute that 420 MW was the “nameplate capacity” of the Mitsubishi steam turbine. OPC argues that the nameplate capacity of 420 MW is by definition an operational limitation and that operation of the steam turbine beyond the maximum rated output of 420 MW threatened safe operation.

83. OPC points to the fact that there are 3 [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] OPC notes that the DEF RCA report does not explain why a [REDACTED]

[REDACTED]
[REDACTED]

84. As to DEF's argument that [REDACTED]

[REDACTED]

[REDACTED] OPC replies that had DEF operated the turbine within its original operating limitations during Period 1, there is every reason to believe that the original L-0 blades would still be functioning, consistent with [REDACTED] In other words, there would have been no Periods 2, 3, 4, or 5 but for DEF's actions during Period 1.

85. OPC points out that neither DEF nor any other subsidiary of Duke Energy had experience running a 4x1 combined cycle plant prior to purchasing the Mitsubishi steam turbine and commencing operation of the Bartow Plant. Further, neither DEF nor Mitsubishi had any experience operating a steam turbine at the [REDACTED]

86. Given the lack of experience on either side, OPC contends that DEF should have consulted Mitsubishi before purchasing the steam turbine to ask whether Mitsubishi believed it was capable of an output in excess of its nameplate capacity of 420 MW. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

87. OPC's expert witness, Richard Polich, pointed out that Mitsubishi's consultant ran over [REDACTED]

88. Mr. Polich testified that the Mitsubishi steam turbine was an aftermarket unit designed for a [REDACTED]

[REDACTED] To support his opinion, Mr. Polich pointed out that when DEF finally did ask whether the turbine could run past 420 MW, [REDACTED]

89. DEF ran the unit beyond 420 MW without consulting Mitsubishi. Mr. Polich found it a tribute to the design of the [REDACTED] 40" L-0 blades that they did not suffer damage sooner than they did. The steam turbine operated from June 2009 until March 2012 before the blade damage was noted. It was impossible to state exactly when the blade damage occurred in Period 1, but Mr. Polich opined that the damage was most likely cumulative.⁴

90. Mr. Polich noted that the blade failure in Period 5 was the fastest of any period, though the [REDACTED] Mr. Polich further noted that the DEF RCA did not address why the blades lasted longer in Periods 1 and 2 than in the other three periods. Mr. Polich reasonably concluded that there had to be something about the blades' [REDACTED]

⁴ DEF made much of the fact that it could not be said precisely when during Period 1 the damage to the blades occurred, pointing out that there was a 50-50 chance that the blades were damaged when the turbine was operating below 420 MW. This argument fails to consider the cumulative wear caused by running the unit in excess of its capacity half of the time. The exact moment the damage occurred is beside the point.

that allowed them to last longer, and something in the [REDACTED] that caused them to fail quickly.

91. Mr. Polich believed that the [REDACTED] He noted that there were 28 months of operation below 420 MW during Period 2 and that there was basically no damage to the blades beyond the usual [REDACTED]

92. Mr. Polich thought that [REDACTED] Mr. Polich did not believe the five periods could be correlated, [REDACTED]

93. Mr. Polich testified that DEF would have acted prudently from both a warranty and a regulatory perspective by requesting written verification from Mitsubishi that the steam turbine could be safely operated above 420 MW of output.

94. Mr. Swartz countered that it would not be a “typical conversation” in the industry to ask Mitsubishi whether and how long the unit could be operated above 420 MW. He pointed out that pounds per hour per square foot of steam flow is not a parameter that can be measured during operation. It is a calculated number that DEF could not possibly have used to govern operation of the turbine.

95. Mr. Swartz testified that “420 MW” is the electrical output of the generator, which is coupled to the steam turbine. The steam turbine’s operation is governed by parameters such as pressures, steam flows, and temperatures. Mr. Swartz stated that it is common in the industry to speak in terms of megawatts to get a feel for the size of the unit, but that generator output is dependent on many factors.

96. Mr. Swartz stated that when Mitsubishi criticized DEF for operations above 420 MW, it was using that term as a proxy for [REDACTED]. [REDACTED] It was his opinion that 420 MW was not an operational limit on the steam turbine.

97. Mr. Swartz testified that the [REDACTED]. [REDACTED] He stated that operation of the steam turbine above 420 MW could be correlated with [REDACTED] but many other factors are involved in determining what a generator can produce.

98. Mr. Swartz stated that the power factor was the key to DEF's ability to operate the steam turbine above 420 MW. Mitsubishi used [REDACTED] with a power factor of [REDACTED] to predict an output of 420 MW. Using the same operating factors, DEF was able to run the steam turbine at a power rating between .97 and .995. Mr. Swartz testified that this increased efficiency enabled the Bartow generator to operate above 420 MW.

99. Mr. Swartz conceded that the [REDACTED]. [REDACTED] [REDACTED] [REDACTED] at least from DEF's perspective. If DEF was able to obtain more, such was to the ultimate benefit of its ratepayers and was consistent with the operating limitations set forth in the Purchasing Agreement.

100. OPC responds that the record of this proceeding contains no indication that at any time during the five-year long, continuous, iterative RCA process did DEF's engineers suggest that the power factor of [REDACTED] in [REDACTED] an indication that the steam turbine output of 420 MW could be safely exceeded.

101. OPC points to several statements recorded during the RCA process indicating that DEF's engineers and Mitsubishi alike acknowledged that 420 MW was the design limit of the steam turbine: [REDACTED]. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

102. OPC's essential criticism was that DEF pushed the Mitsubishi steam turbine beyond its operational limits, whether the issue is framed in terms of megawatts of electrical output beyond the design point or in terms of steam flow [REDACTED]. The evidence was clear that Mitsubishi did not contemplate DEF's operation of the steam turbine beyond the [REDACTED]. The evidence was also clear that DEF made no effort before the fact to notify Mitsubishi of its intended intensity of operation or to ask Mitsubishi whether it could safely exceed the [REDACTED]. Mr. Swartz was unable to explain away this criticism and thus DEF failed to meet its burden of demonstrating that it prudently operated the Bartow Plant during the times relevant to this proceeding.

CONCLUSIONS OF LAW

103. DOAH has jurisdiction of the subject matter of and the parties to this proceeding. §§ 120.569 and 120.57(1), Fla. Stat.

104. The Commission has the authority to regulate electric utilities in the State of Florida pursuant to the provisions of chapter 366, including sections 366.04, 366.05, and 366.06.

105. An "electric utility" is defined as "any municipal electric utility, investor-owned electric utility, or rural electric cooperative which owns, maintains, or operates an electric generation, transmission, or distribution system within the state." § 366.02(2), Fla. Stat.

106. DEF is an investor-owned electric utility operating within the State of Florida subject to the jurisdiction of the Commission pursuant to chapter 366.

107. OPC, FIPUG, and White Springs are parties to the Fuel Clause docket, which included the issues to be resolved here, and as such are entitled to participate as parties in this proceeding.

108. This is a de novo proceeding. § 120.57(1)(k), Fla. Stat. Petitioner, DEF, has the burden of proving, by a preponderance of the evidence, that it acted prudently in its actions and decisions leading up to and in restoring the unit to service after the February 2017 forced outage at the Bartow Plant. Additionally, DEF must prove by a preponderance of the evidence that no adjustment to replacement power costs should be made to account for the fact that after the installation of a pressure plate in March 2017, the Bartow Plant could no longer produce its rated nameplate capacity of 420 MW. *Dep't of Transp. v. J.W.C. Co.*, 396 So. 2d 778, 788 (Fla. 1st DCA 1981); § 120.57(1)(j), Fla. Stat.

109. The legal standard for determining whether replacement power costs are prudent is “what a reasonable utility manager would have done, in light of the conditions and circumstances that were known, or should [have] been known, at the time the decision was made.” *S. Alliance for Clean Energy v. Graham*, 113 So. 3d 742, 750 (Fla. 2013).

110. DEF failed to demonstrate by a preponderance of the evidence that its actions during Period 1 were prudent. DEF purchased an aftermarket steam turbine from Mitsubishi with the knowledge that it had been manufactured to the specifications of Tenaska with a design point of 420 MW of output. Mr. Swartz’s testimony regarding the irrelevance of the 420 MW limitation was unpersuasive in light of the documentation that after the initial blade failure, DEF itself accepted the limitation and worked with Mitsubishi to find a way to increase the output of the turbine to [REDACTED]

111. DEF’s RCA concluded that the blade failures were caused [REDACTED]

[REDACTED] This conclusion is belied by the fact that [REDACTED]

[REDACTED] Mitsubishi cannot be faulted for

[REDACTED] in a way that would allow an operator to run the turbine consistently beyond its capacity.

112. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

113. Mr. Polich persuasively argued that it would have been simple prudence for DEF to ask Mitsubishi about the ability of the turbine to operate continuously in excess of 420 MW output before actually operating it at those levels. DEF understood that the blades had been designed for the Tenaska 3x1 configuration and should have at least explored with Mitsubishi the wisdom of operating the steam turbine with steam flows in excess of those anticipated in the original design.

114. The record evidence demonstrated an [REDACTED] that vibrations associated with high energy loadings were the primary cause of the L-0 blade failures. DEF failed to satisfy its burden of showing its actions in operating the steam turbine in Period 1 did not cause or contribute significantly to the vibrations that repeatedly damaged the L-0 blades. To the contrary, the preponderance of the evidence pointed to DEF's operation of the steam turbine in Period 1 as the most plausible culprit.

115. DEF demonstrated by a preponderance of the evidence that its actions during Periods 2 through 5 were prudent.

116. DEF argues that even if it failed to exercise prudence during Period 1, those actions were so attenuated by DEF's subsequent actions during Periods 2 through 5 that the outage and de-rating that began in 2017 cannot be fairly attributed to DEF's failures from 2009 through March 2012. If the imprudent operation in Period 1 did not cause the Period 5 outage, then the imprudent operation cannot be a basis for disallowance of the replacement power costs at issue.

117. OPC argues that Periods 2 through 5 would not have been necessary had DEF operated the turbine within its original operating limitations during Period 1. OPC contends that, based on [REDACTED], there is every reason to believe that the original L-0 blades would still be functioning but for DEF's overstressing them in Period 1.

118. OPC states that the applicable standard for prudence review is how a prudent and reasonable utility manager would have operated a new steam turbine under the conditions and circumstances which were known, or reasonably should have been known, when decisions were made in 2008 through 2012. OPC argues that it was imprudent and unreasonable for DEF to regularly supply steam to the steam turbine at levels causing the steam turbine to operate above the design point of 420 MW, especially given the fact that the steam turbine was not designed for the Bartow Plant and was sold to DEF with an [REDACTED]

119. It is speculative to state that the original Period 1 L-0 blades would still be operating today had DEF observed the [REDACTED] of 420 MW. It is not speculative to state that the events of Periods 2 through 5 were precipitated by DEF's actions during Period 1. It is not possible to state what would have happened from 2012 to 2017 if the excessive loading had not occurred, but it is possible to state that events would not have been the same.

120. In his closing argument, counsel for White Springs summarized the equities of the situation very well:

You can drive a four-cylinder Ford Fiesta like a V8 Ferrari, but it's not quite the same thing. At 4,000 RPMs, in second gear, the Ferrari is already doing 60 and it's just warming up. The Ford Fiesta, however, will be moaning and begging you to slow down and shift gears. And that's kind of what we're talking about here.

It's conceded as fact that the root cause of the Bartow low pressure turbine problems is [REDACTED]

██████████ caused repeatedly over time. The answer to the question is was this due to the way [DEF] ran the plant or is it due to a ██████████ Well, the answer is both.

The fact is that [DEF] bought a steam turbine that was already built for a different configuration that was in storage, and then hooked it up to a configuration ... that it knew could produce much more steam than it needed. It had a generator that could produce more megawatts, so the limiting factor was the steam turbine.

On its own initiative, it decided to push more steam through the steam turbine to get more megawatts until it broke.

* * *

So from our perspective, [DEF] clearly was at fault for pushing excessive steam flow into the turbine in the first place. The repair which has been established ... may or may not work, but the early operation clearly impeded [DEF's] ability to simply claim that Mitsubishi was entirely at fault. And under those circumstances, it's not appropriate to assign the cost to the consumers.

121. The greater weight of the evidence supports the conclusion that DEF did not exercise reasonable care in operating the steam turbine in a configuration for which it was not designed and under circumstances which DEF knew, or should have known, that it should have proceeded with caution, seeking the cooperation of Mitsubishi to devise a means to operate the steam turbine above 420 MW.

122. Given DEF's failure to meet its burden, a refund of replacement power costs is warranted. At least \$11.1 million in replacement power was required during the Period 5 outage. This amount should be refunded to DEF's customers.

123. DEF failed to carry its burden to show that the Period 5 blade damage and the required replacement power costs were not consequences of DEF's imprudent operation of the steam turbine in Period 1.

124. The de-rating of the steam turbine that required the purchase of replacement power for the 40 MW loss caused by installation of the pressure plate was a consequence of DEF's failure to prudently operate the steam turbine during Period 1. Because it was ultimately responsible for the de-rating, DEF should refund replacement costs incurred from the point the steam turbine came back online in May 2017 until the start of the planned fall 2019 outage that allowed the replacement of the pressure plate with the [REDACTED] in December 2019. Based on the record evidence, the amount to be refunded due to the de-rating is \$5,016,782.

125. The total amount to be refunded to customers as a result of the imprudence of DEF's operation of the steam turbine in Period 1 is \$16,116,782, without interest.

RECOMMENDATION

Based upon the foregoing Findings of Fact and Conclusions of Law, it is RECOMMENDED that the Public Service Commission enter a final order finding that Duke Energy Florida, LLC, failed to demonstrate that it acted prudently in operating its Bartow Unit 4 plant and in restoring the unit to service after the February 2017 forced outage, and that Duke Energy Florida, LLC, therefore may not recover, and thus should refund, the \$16,116,782 for replacement power costs resulting from the steam turbine outages from April 2017 through September 2019.

DONE AND ENTERED this 27th day of April,2020, in Tallahassee, Leon
County, Florida.

Lawrence P. Stevenson

LAWRENCE P. STEVENSON
Administrative Law Judge
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-3060
(850) 488-9675
Fax Filing (850) 921-6847
www.doah.state.fl.us

Filed with the Clerk of the
Division of Administrative Hearings
this 27th day of April, 2020.

COPIES FURNISHED:

Jon C. Moyle, Jr., Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301
(eServed)

Nickalus Austin Holmes, Commission Deputy Clerk I
Florida Public Service Commission
2450 Shumard Oak Boulevard
Tallahassee, Florida 32399
(eServed)

Matthew Bernier, Esquire
Duke Energy Florida, LLC
Suite 800
106 East College Avenue
Tallahassee, Florida 32301
(eServed)

James Ray Kelly, Public Counsel
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399
(eServed)

Dianne M. Triplett, Esquire
Duke Energy Florida, LLC
299 1st Avenue North
St. Petersburg, Florida 33701
(eServed)

Patty Christensen, Esquire
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399

Stephanie Morse, Esquire
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399

James Walter Brew, Esquire
Stone Law Firm
Eighth Floor, West Tower
1025 Thomas Jefferson Street Northwest
Washington, DC 20007
(eServed)

Suzanne Smith Brownless, Esquire
Florid Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Thomas A. (Tad) David, Esquire
Office of Public Counsel
Room 812
111 West Madison Street
Tallahassee, Florida 32399-1400
(eServed)

Laura Wynn Baker, Associate
Stone Mattheis Xenopoulos & Brew, P.C.
1025 Thomas Jefferson Street Northwest
Washington, DC 20007
(eServed)

Daniel Hernandez, Esquire
Shutts & Bowen LLP
Suite 300
4301 West Boy Scout Boulevard
Tampa, Florida 33607
(eServed)

Charles John Rehwinkel, Deputy Public Counsel
Florida Office of Public Counsel
111 West Madison Street
Tallahassee, Florida 32399
(eServed)

Karen Ann Putnal, Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301
(eServed)

Bianca Y. Lherisson, Esquire
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399
(eServed)

Adam Teitzman, Commission Clerk
Office of the Commission Clerk
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Braulio Baez, Executive Director
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Keith Hetrick, General Counsel
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

NOTICE OF RIGHT TO SUBMIT EXCEPTIONS

All parties have the right to submit written exceptions within 15 days from the date of this Recommended Order. Any exceptions to this Recommended Order should be filed with the agency that will issue the Final Order in this case.

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: FUEL AND PURCHASED POWER
COST RECOVERY CLAUSE WITH
GENERATING PERFORMANCE INCENTIVE
FACTOR,

Case No. 19-6022

RECOMMENDED ORDER

Pursuant to notice, a final hearing was conducted in this case on February 4 and 5, 2020, in Tallahassee, Florida, before Lawrence P. Stevenson, a duly-designated Administrative Law Judge (“ALJ”) of the Division of Administrative Hearings (“DOAH”).

APPEARANCES

For Duke Energy Florida, LLC (“DEF”¹):

Diane M. Triplett, Esquire
Duke Energy Florida, LLC
299 First Avenue North
St. Petersburg, Florida 33701

Matthew Bernier, Esquire
Duke Energy Florida, LLC
106 East College Avenue, Suite 800
Tallahassee, Florida 32301

Daniel Hernandez, Esquire
Shutts & Bowen, LLP
4301 West Boy Scout Boulevard, Suite 300
Tampa, Florida 33607

¹ References to DEF include Progress Energy, DEF’s predecessor in interest in the Bartow power plant that is the subject of this proceeding. DEF purchased Progress Energy in 2011.

For the Public Service Commission (the “Commission”):

Suzanne Smith Brownless, Esquire
Bianca Y. Lherisson, Esquire
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32339-0850

For the Office of Public Counsel (“OPC”):

James Ray Kelly, Public Counsel
Charles John Rehwinkel, Deputy Public Counsel
Thomas A. (Tad) David, Esquire
Patty Christensen, Esquire
Stephanie Morse, Esquire
Office of Public Counsel
111 West Madison Street, Room 812
Tallahassee, Florida 32399-1400

For Florida Industrial Power Users Group (“FIPUG”):

Jon C. Moyle, Jr., Esquire
Karen Ann Putnal, Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301

For White Springs Agricultural Chemicals, Inc., d/b/a PCS Phosphate—
White Springs (“White Springs”):

James Walter Brew, Esquire
Stone Law Firm
Eighth Floor, West Tower
1025 Thomas Jefferson Street Northwest
Washington, DC 20007

STATEMENT OF THE ISSUES

Two issues have been referred by the Commission to DOAH for a
disputed-fact hearing:

ISSUE 1B: Was DEF prudent in its actions and decisions leading up to
and in restoring the unit to service after the February 2017 forced outage at

the Bartow plant and, if not, what action should the Commission take with respect to replacement power costs?

ISSUE 1C: Has DEF made prudent adjustments, if any are needed, to account for replacement power costs associated with any impacts related to the de-rating of the Bartow plant? If adjustments are needed and have not been made, what adjustment(s) should be made?

PRELIMINARY STATEMENT

On January 2, 2019, the Commission opened Docket No. 20190001-EI, *In re: Fuel and purchased power cost recovery clause with generating performance incentive factor*, commonly referred to as the “Fuel Clause” docket. The Fuel Clause docket is a recurring, annual docket to which all investor-owned electric utilities serving customers in Florida are parties. Through the Fuel Clause docket, utilities are permitted to recover reasonably and prudently incurred costs of the fuel and fuel-related activities needed to generate electricity. Among the issues raised in the 2019 Fuel Clause docket was DEF’s request to recover the replacement power costs incurred in connection with an unplanned outage to the steam turbine at DEF’s Bartow Unit 4 combined cycle power plant (the “Bartow Plant”) in February 2017. Issues 1B and 1C were raised as part of the 2019 Fuel Clause docket.

On November 5, 2019, the Commission held a final hearing in the 2019 Fuel Clause docket. All issues related to DEF’s request to recover its fuel and purchased power costs were addressed, except for Issues 1B and 1C. Both Issues 1B and 1C involved extensive claims of confidentiality with respect to the pre-filed testimony of DEF witness Jeffrey Swartz, OPC witness Richard Polich, and the proposed trial exhibits.

The Commission found that it was impracticable to conduct direct or cross-examination in an open hearing without extensive reference to

confidential material. Despite its apparent authority under section 366.093, Florida Statutes, to declare documents confidential, the Commission took the position that it lacked authority to close a public hearing to protect materials and topics it had previously determined to be confidential. The Commission therefore referred Issues 1B and 1C to DOAH for a closed evidentiary hearing and issuance of a Recommended Order.

On November 26, 2019, a telephonic status conference was held to set hearing dates, establish the procedures for handling confidential material, the need for discovery, the use of written testimony, and the use of the Comprehensive Exhibit List (“CEL”) admitted into evidence at the Commission’s November 5, 2019, hearing. At the status conference, the parties agreed to the hearing dates of February 4 and 5, 2020. The undersigned requested the parties to confer and file a motion setting forth proposed procedures for the handling of confidential material before, during, and after the hearing. The parties filed a Joint Motion on Confidentiality on December 6, 2019, which was adopted by Order issued December 9, 2019.

On December 23, 2019, the Commission’s record was transmitted to DOAH on two CD-ROM discs. Disc One contained non-confidential information and Disc Two contained information held as confidential.

The final hearing was convened and completed as scheduled on February 4 and 5, 2020. At the outset of the hearing, the parties submitted an updated CEL from the November 2019 proceeding before the Commission. The revised CEL listed 114 exhibits. The revised CEL was numbered as Exhibit 114 and admitted by stipulation.

DEF presented the direct and rebuttal testimony of Jeffrey R. Swartz, its Vice President of Generation. DEF moved for the admission of Exhibits 80 through 82, which were admitted into the record.

OPC presented the testimony of Richard Polich, an engineer with expertise in the design of power generation systems, including steam turbines. OPC moved for the admission of Exhibits 68 through 75 and 101 through 109, which were admitted into the record. At the hearing, OPC Exhibits 115 through 117 were marked, moved, and admitted into the record.

The Commission moved for the admission of Exhibits 110 and 111, which were admitted into the record.

FIPUG moved for the admission of Exhibit 118, which was admitted into the record.

White Springs moved for the admission of Exhibits 112 and 113, which were admitted into the record.

The three-volume Transcript of the final hearing was filed with DOAH on February 24, 2020. Pursuant to an agreement approved by the undersigned, the parties timely filed their Proposed Recommended Orders on March 20, 2020. DEF and the Commission filed separate Proposed Recommended Orders. OPC, FIPUG, and White Springs submitted a joint Proposed Recommended Order (unless otherwise specified, references to OPC as to positions stated in its Proposed Recommended Order should be understood to include FIPUG and White Springs). All three Proposed Recommended Orders have been duly considered in the writing of this Recommended Order.

Unless otherwise indicated, statutory references are to the 2019 edition of the Florida Statutes.

FINDINGS OF FACT

Based on the evidence adduced at hearing, and the record as a whole, the following Findings of Fact are made:

THE PARTIES

1. The Commission is the state agency authorized to implement and enforce Chapter 366, Florida Statutes, which governs the regulation of every “public utility” as defined in section 366.02(1).

2. DEF is a public utility and is therefore subject to the Commission’s jurisdiction. DEF is a subsidiary of Duke Energy, one of the largest energy holding companies in the United States.

3. OPC is statutorily authorized to represent the citizens of the state of Florida in matters before the Commission, and to appear before other state agencies in connection with matters under the Commission’s jurisdiction. § 350.0611(1), (3), and (5), Fla. Stat.

4. FIPUG is an association comprising large commercial and industrial power users within Florida. A substantial number of FIPUG’s members are customers of DEF.

5. White Springs operates energy intensive phosphate mining and processing facilities in Hamilton County and is one of DEF’s largest industrial customers.

THE BARTOW PLANT

6. The Bartow Plant is a 4x1 combined cycle power plant composed of combustion turbine generators whose waste heat is used to produce steam that powers a steam turbine manufactured by Mitsubishi Hitachi Power Systems (“Mitsubishi”). “4x1” references the fact that there are four Siemens

180 megawatt (“MW”) Type 501 F combustion turbines, each connected to one of four heat recovery steam generators (“HRSG”), all of which in turn are connected to one steam turbine.

7. A combined cycle power plant uses gas and steam turbines together to produce electricity. Combustion of natural gas in the combustion turbine turns a generator that produces electricity. The waste heat from the combustion turbine is routed to an HRSG. The HRSG produces steam that is then routed to the steam turbine which, in turn, generates extra power.

8. Combined cycle plants can be set up in multiple configurations, providing considerable operational flexibility and efficiency. It is not necessary for all four HRSGs to provide steam to the steam turbine at the same time. The Bartow Plant can operate on all possible configurations of 4x1, i.e., 1x1, 2x1, 3x1, or 4x1. It also has the ability to augment heat through the use of duct burners. The combustion turbines can operate in “simple cycle” mode to generate electricity when the steam turbine is off-line.

9. The steam turbine is made up of a high pressure (“HP”)/intermediate pressure (“IP”) section and a low-pressure (“LP”) section. Each of these turbine sections has a series of blades. As the steam passes through the blades, the steam exerts its force to turn the blades which, in their turn, cause a rotor to spin. The rotor is connected to a generator, and the generator produces electricity.

10. Steam leaving the HRSGs is introduced to the steam turbine at a high-pressure inlet into the HP turbine. The steam is returned to the HRSG for reheating, then enters the IP turbine. Finally, steam exiting the IP turbine is directed into the LP turbine.

11. The LP section of the steam turbine is dual-flow. The steam is admitted in the middle and flows axially in opposite directions through two opposing mirror-image turbine sections, each of which contains four sets of blades. After passing through the LP section, the steam exhausts into a condenser.

12. The sets of blades increase in size from the front to the back of the LP section. The blades get longer as the steam flows through the turbine. The steam loses energy as it passes through the machine and thus more surface area of blade is needed for the weaker steam to produce the force needed to spin the rotor. The final stage of blades in the LP section consists of 40" L-0 blades, the longest blades in the steam turbine.

13. [REDACTED]

14. The Mitsubishi steam turbine was originally designed for Tenaska Power Equipment, LLC ("Tenaska"), to be used in a 3x1 combined cycle configuration with three M501 Type F combustion turbines connected to the steam turbine with a gross output of 420 MW of electricity. For reasons unexplored at the hearing, Tenaska never took delivery of the turbine. It was stored in a Mitsubishi warehouse under controlled conditions that kept it in like-new condition.

15. During the design and planning process for the Bartow Plant, DEF's employees responsible for obtaining company approval to build the plant, reported to senior executives that they had found this already-built steam turbine. The Business Analysis Package of DEF's project authorization documents stated that the Mitsubishi steam turbine "proved to be a very good fit for the 4 CT and 4 HRSG combinations."

16. Prior to purchasing the steam turbine, DEF contracted with Mitsubishi to evaluate the design conditions to ensure the steam turbine was compatible with the Bartow Plant's proposed 4x1 combined cycle configuration. [REDACTED]

[REDACTED]

24. Mr. Swartz further asserted that, prior to completion of the Purchase Agreement, Mitsubishi understood that DEF intended to operate the steam turbine in a 4x1 configuration with a power factor exceeding [REDACTED] which would result in the generation of more than 420 MW of electrical output.

25. Section 3.2 of the Purchase Agreement, titled [REDACTED] states, in relevant part:

[REDACTED]

26. The plain language of section 3.2.1 establishes [REDACTED]

² MPS stands for Mitsubishi Power Systems, Inc.

[REDACTED] It is unclear how Mr. Swartz translated this language into a [REDACTED]

27. In any event, the parties disagree as to the significance of the 420 MW maximum output designation. DEF and the Commission contend that the designated megawatt capacity of a steam turbine is not a control mechanism or a limit that the operator must stay below, but is the byproduct of operating the unit within the design parameters provided by the manufacturer at various combinations of such factors as steam flows, steam temperatures, steam pressures, exhaust pressures, ambient temperatures, and humidity.

28. DEF and the Commission contend that the numbers stated in the [REDACTED] are calculated estimates of the conditions that will achieve [REDACTED]

[REDACTED] output. If DEF was able in practice to operate the steam turbine within the design parameters and achieve output in excess of [REDACTED] then it was simply delivering maximum value to its ratepayers.

29. OPC asserts 420 MW is an operational limitation. [REDACTED]

[REDACTED] OPC points out that Mitsubishi conducted extensive [REDACTED] (from December 2014 until April 2016) that resulted in a document titled, [REDACTED] [REDACTED] dated March 18, 2015 (the "Report"). The Report expressly stated that the [REDACTED] [REDACTED] The Report also stated that the [REDACTED] [REDACTED] These statements were supported by section 3.2.1.2 of the Purchase Agreement, which states that [REDACTED] [REDACTED] of the steam turbine.

30. OPC points out that section 4.1 of the Purchase Agreement, titled [REDACTED] expressly states: [REDACTED]

[REDACTED]

31. OPC notes that [REDACTED] reached [REDACTED] of output using only [REDACTED]. OPC further notes that the Bartow Plant had a [REDACTED] meaning that it had the ability to produce [REDACTED] of output when compared to the [REDACTED] for which the steam turbine was originally designed.

32. The Mitsubishi steam turbine converts steam energy into rotational force (horsepower) that in turn drives an electric generator. The generator purchased by DEF for the Bartow Plant that was attached to the Mitsubishi steam turbine was manufactured by a different vendor and is rated at 468 MW. The generator thus was capable of reliably producing more electrical output than Mitsubishi stated its steam turbine was designed to supply.

33. The greater weight of the evidence establishes that the Mitsubishi steam turbine was designed to operate at 420 MW of output and that 420 MW was an operational limitation of the turbine.

OUTAGES AND BLADE FAILURES

34. DEF has classified the periods during which the Bartow Plant has been operational as: Period 1-- from June 2009 until March 2012; Period 2-- from April 2012 until August 2014; Period 3-- from December 2014 until April 2016; Period 4-- from May 2016 until October 2016; and Period 5-- from December 2016 until February 2017.

35. DEF placed the Bartow Plant into commercial service in June 2009. Later that year, DEF began operating the steam turbine above 420 MW

under varying system conditions. Mr. Swartz estimated that DEF operated the steam turbine above 420 MW about half the time between June 2009 and March 2012, the time span that has been designated as Period 1 of the five periods in question in this proceeding. The Bartow Plant operated for a total of 21,734 hours during Period 1.

36. In March 2012, while conducting a routine inspection of the steam turbine during a planned power outage, DEF found that [REDACTED]
[REDACTED]
[REDACTED] DEF consulted with Mitsubishi regarding the damage. Mitsubishi inspected the blades and recommended [REDACTED]
[REDACTED]

37. Mitsubishi concluded that the damage to the blades was caused by [REDACTED]
[REDACTED]
[REDACTED] Up to this point, Mitsubishi had [REDACTED]
[REDACTED] DEF and Mitsubishi had assumed that if [REDACTED]
[REDACTED] of the steam turbine, then the [REDACTED]
[REDACTED] would be acceptable. After discovery of the blade failure in March 2012, [REDACTED]
[REDACTED]
[REDACTED]³

38. Period 2 commenced in April 2012 and ended in August 2014, a period of 28 months. At the beginning of Period 2, DEF and Mitsubishi replaced all of the L-0 blades on the affected end of the LP turbine with [REDACTED]
[REDACTED]

39. During Period 2, DEF operated the steam turbine a total of 21,284 hours. For all but two hours of this period, DEF operated the steam turbine

³ [REDACTED]
[REDACTED]

at less than 420 MW and complied with Mitsubishi's [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

40. During a planned outage beginning in August 2014, Mitsubishi replaced the [REDACTED] used in Period 2 with [REDACTED] [REDACTED] thus beginning Period 3. During this planned outage, DEF and Mitsubishi conducted an inspection of the Period 2 [REDACTED] blades. The inspection revealed a [REDACTED] consistent with ordinary usage over the course of Period 2. There was no damage noted to [REDACTED]. There was some [REDACTED] described as [REDACTED].

41. Between Period 2 and Period 3, Mitsubishi and DEF installed [REDACTED] in the steam turbine to allow for [REDACTED] which they expected would help them to understand why the L-0 blades were experiencing damage and to [REDACTED] [REDACTED] protect the equipment.

42. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 2.

43. Period 3 commenced in December 2014 and ended in April 2016. During Period 3, DEF operated the steam turbine a total of 10,286 hours. DEF never exceeded 420 MW of output, except for a [REDACTED]
[REDACTED]
[REDACTED]

44. During Period 3, Mitsubishi [REDACTED] on the steam turbine. The [REDACTED]

calculated that the Bartow steam turbine experienced approximately [REDACTED] and Mitsubishi's fleet experience had been [REDACTED] on last stage blades including the 40" L-0 blades. Mitsubishi was uncertain what impact the L-0 blades would experience at [REDACTED]

45. Mitsubishi concluded that [REDACTED]

[REDACTED]

46. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 3.

47. Despite DEF's having [REDACTED]

[REDACTED] DEF and Mitsubishi's examination of the steam turbine at the end of Period 3 revealed that [REDACTED]

[REDACTED] DEF and Mitsubishi decided that [REDACTED] [REDACTED] were installed.

48. Period 4 commenced in June 2016 and ended five months later in October 2016. During Period 4, DEF operated the steam turbine a total of 2,942 hours. DEF did not exceed 420 MW of output during this period and [REDACTED]

49. Just five months after the commencement of Period 4, DEF detected vibration changes in the LP turbine and stopped operation of the steam turbine to inspect the L-0 blades. During this inspection, DEF and Mitsubishi once again found several damaged L-0 blades. At the time of this blade damage, DEF was operating the steam turbine below 420 MW and observing the operating parameters established by Mitsubishi [REDACTED]

50. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 4.

51. Period 5 began in December 2016 and ended two months later in February 2017.

52. At the beginning of Period 5, DEF and Mitsubishi [REDACTED]

[REDACTED]

[REDACTED] of 1,561 hours. DEF never exceeded 420 MW of output during this period and operated the steam turbine within the operating parameters established by Mitsubishi [REDACTED]

54. On February 9, 2017, the steam turbine was removed from service when DEF detected the presence of sodium in the steam water cycle. The cooling water used for the condenser is salt water from Tampa Bay. Mr. Swartz testified that any indication of sodium inside the condenser above minute amounts is alarming. During this shutdown, DEF performed an inspection of the steam turbine and discovered that a [REDACTED]

device known as a rupture disk had failed in the LP turbine and that the L-0 blades were damaged. DEF concluded that [REDACTED] the rupture disk. This forced outage lasted until April 8, 2017.

55. Based on the sequence of events, DEF was able to determine with certainty that the blade damage during Period 5 occurred on February 9, 2017. At that time, DEF was operating the steam turbine below 420 MW and within the operating parameters established by Mitsubishi [REDACTED]

56. It was undisputed that DEF's operation of the steam turbine was prudent at all times during Period 5.

57. During the February 2017 forced outage of the steam turbine, DEF continued to operate the Bartow Plant with the gas turbines running in simple cycle mode.

58. DEF took three primary actions in the wake of the Period 5 outage: a root cause analysis ("RCA") team, established after the first blade failure in Period 1, continued its mission to investigate and prepare an RCA; a restoration team was formed to bring the steam turbine back online; and a team was formed to evaluate a long-term solution for the steam turbine.

[REDACTED]
[REDACTED]
[REDACTED]

60. Instead, DEF and Mitsubishi installed pressure plates in place of the L-0 blades as an interim solution that would bring the steam turbine back into operation quickly and give Mitsubishi and DEF time to develop a permanent solution. A pressure plate is a non-rotating plate that has holes drilled into it. The pressure plate reduces the pressure of the steam passing through a steam turbine, keeping the steam from damaging the unit's condenser. A pressure plate does not use the steam passing through it to produce electricity and therefore decreases the efficiency of a steam turbine.

The pressure plate applied by DEF limited the output of the steam turbine to 380 MW.

61. The parties have agreed and the undersigned accepts that the period of the steam turbine's "de-rating" from 420 MW to 380 MW should be calculated as running from April 2017 through the end of September 2019.

THE MITSUBISHI AND DEF ROOT CAUSE ANALYSES

62. Mitsubishi's [REDACTED] during Period 3 [REDACTED]

[REDACTED]

[REDACTED] of its RCA in a 35-page "Bartow RCA Summary" ("Mitsubishi RCA"). The Mitsubishi RCA documented the [REDACTED]

[REDACTED]

64. The Mitsubishi RCA also stated that an [REDACTED]

65. After the discovery of the blade damage in March 2012, DEF formed an RCA team and began a years-long RCA process that ended with its own February 6, 2018, RCA report (“DEF RCA”).

66. DEF’s RCA [REDACTED]

67. [REDACTED]

team produced between 2012 and the final DEF RCA in February 2018. Mr. Swartz declined to call these documents “drafts” of the RCA, preferring to say they were “working papers” that provided snapshots of the RCA team’s investigation at a given time. Mr. Swartz emphasized that only the February 2018 RCA report stated DEF’s official position as to the cause of the blade failures.

69. The working papers indicate that as late as October 15, 2016, DEF

70. The working papers show that as late as June 26, 2017, DEF maintained that one of “the most significant contributing factors toward root

cause of the history of Bartow Unit 4 L-0 events” was [REDACTED]

71. OPC accurately states that the DEF working documents demonstrate that during the RCA process, before and after the Period 5 event, DEF consistently identified excessive steam flow in the LP turbine as one of the “most significant contributing factors” toward blade failure over the history of the steam turbine, the [REDACTED].

72. Mr. Swartz attempted to minimize the significance of the working papers by stating that DEF was obliged to investigate the issue of excessive steam flow because [REDACTED]

73. DEF’s final RCA did not include a statement that excessive steam flow was a significant contributing factor in the blade failures. The final DEF RCA instead noted that “excessive steam flow” had been a “potential” operational factor that DEF examined during the RCA process. The RCA states that DEF had been unable to find a correlation between [REDACTED] and the five failure periods. In particular, the RCA pointed out that [REDACTED]

74. OPC concludes that the final DEF RCA was DEF’s self-serving attempt to exonerate its own overloading of the steam turbine and to shift responsibility onto Mitsubishi for [REDACTED] DEF contends that it simply followed the data throughout the RCA process and arrived at the only conclusion consistent with the findings of its engineers.

POST-RCA ACTIONS

75. As noted above, pressure plates were installed in place of the L-0 blades at the conclusion of Period 5. The pressure plates allowed DEF to keep the steam turbine running at a lower level of output while it sought a permanent solution to the blade damage problem.

76. In 2018, DEF solicited proposals to implement a long-term solution that would allow it to reliably operate the steam turbine to support 450 MW of electrical output from the generator. Three vendors responded. [REDACTED]

[REDACTED] DEF selected the Mitsubishi proposal.

77. In December 2019, Mitsubishi installed [REDACTED]

[REDACTED] As of the hearing date, DEF had operated the Bartow Plant with the [REDACTED] L-0 blades without incident on a 1x1, 2x1, and 3x1 configuration, but had yet to operate with all four combustion turbines.

78. OPC points out that in proposing its [REDACTED] blades, Mitsubishi did not waver from the conclusion of its RCA. Mitsubishi stated the following as the first three bullet points in the introduction to its paper describing the testing of the [REDACTED] blades:

[REDACTED]

[REDACTED]

[REDACTED]

REPLACEMENT POWER AND DE-RATING COSTS

79. The record evidence established that the replacement power costs stemming from the February 2017 outage are \$11.1 million.

80. Further, the record evidence established that DEF incurred replacement power costs from May 2017 through September 2019, the period of the “de-rating” of the steam turbine, i.e., the reduction in output from 420 MW to 380 MW while it operated with the pressure plate. Those costs, calculated by year, are \$1,675,561 (2017), \$2,215,648 (2018), and \$1,125,573 (2019), for a total of \$5,016,782.

81. Therefore, the total replacement power costs incurred as a result of DEF’s operation of the steam turbine are \$16,116,781, without considering interest.

DISCUSSION

82. As noted above, the parties have a fundamental disagreement as to the significance of the 420 MW maximum output designation that Mitsubishi placed on the steam turbine. The Energy Information Administration of the U.S. Department of Energy defines “generator nameplate capacity” as the “maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer.” There was no dispute that 420 MW was the “nameplate capacity” of the Mitsubishi steam turbine. OPC argues that the nameplate capacity of 420 MW is by definition an operational limitation and that operation of the steam turbine beyond the maximum rated output of 420 MW threatened safe operation.

83. OPC points to the fact that there are 3 [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] OPC notes that the DEF RCA report does not explain why a [REDACTED]

[REDACTED]
[REDACTED]

84. As to DEF's argument that [REDACTED]

[REDACTED]

[REDACTED] OPC replies that had DEF operated the turbine within its original operating limitations during Period 1, there is every reason to believe that the original L-0 blades would still be functioning, consistent with [REDACTED] In other words, there would have been no Periods 2, 3, 4, or 5 but for DEF's actions during Period 1.

85. OPC points out that neither DEF nor any other subsidiary of Duke Energy had experience running a 4x1 combined cycle plant prior to purchasing the Mitsubishi steam turbine and commencing operation of the Bartow Plant. Further, neither DEF nor Mitsubishi had any experience operating a steam turbine at the [REDACTED]

86. Given the lack of experience on either side, OPC contends that DEF should have consulted Mitsubishi before purchasing the steam turbine to ask whether Mitsubishi believed it was capable of an output in excess of its nameplate capacity of 420 MW. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

87. OPC's expert witness, Richard Polich, pointed out that Mitsubishi's consultant ran over [REDACTED]

88. Mr. Polich testified that the Mitsubishi steam turbine was an aftermarket unit designed for a [REDACTED]

[REDACTED] To support his opinion, Mr. Polich pointed out that when DEF finally did ask whether the turbine could run past 420 MW, [REDACTED]

89. DEF ran the unit beyond 420 MW without consulting Mitsubishi. Mr. Polich found it a tribute to the design of the [REDACTED] 40" L-0 blades that they did not suffer damage sooner than they did. The steam turbine operated from June 2009 until March 2012 before the blade damage was noted. It was impossible to state exactly when the blade damage occurred in Period 1, but Mr. Polich opined that the damage was most likely cumulative.⁴

90. Mr. Polich noted that the blade failure in Period 5 was the fastest of any period, though the [REDACTED] Mr. Polich further noted that the DEF RCA did not address why the blades lasted longer in Periods 1 and 2 than in the other three periods. Mr. Polich reasonably concluded that there had to be something about the blades' [REDACTED]

⁴ DEF made much of the fact that it could not be said precisely when during Period 1 the damage to the blades occurred, pointing out that there was a 50-50 chance that the blades were damaged when the turbine was operating below 420 MW. This argument fails to consider the cumulative wear caused by running the unit in excess of its capacity half of the time. The exact moment the damage occurred is beside the point.

that allowed them to last longer, and something in the [REDACTED] that caused them to fail quickly.

91. Mr. Polich believed that the [REDACTED] He noted that there were 28 months of operation below 420 MW during Period 2 and that there was basically no damage to the blades beyond the usual [REDACTED]

92. Mr. Polich thought that [REDACTED] Mr. Polich did not believe the five periods could be correlated, [REDACTED]

93. Mr. Polich testified that DEF would have acted prudently from both a warranty and a regulatory perspective by requesting written verification from Mitsubishi that the steam turbine could be safely operated above 420 MW of output.

94. Mr. Swartz countered that it would not be a “typical conversation” in the industry to ask Mitsubishi whether and how long the unit could be operated above 420 MW. He pointed out that pounds per hour per square foot of steam flow is not a parameter that can be measured during operation. It is a calculated number that DEF could not possibly have used to govern operation of the turbine.

95. Mr. Swartz testified that “420 MW” is the electrical output of the generator, which is coupled to the steam turbine. The steam turbine’s operation is governed by parameters such as pressures, steam flows, and temperatures. Mr. Swartz stated that it is common in the industry to speak in terms of megawatts to get a feel for the size of the unit, but that generator output is dependent on many factors.

96. Mr. Swartz stated that when Mitsubishi criticized DEF for operations above 420 MW, it was using that term as a proxy for [REDACTED]. [REDACTED] It was his opinion that 420 MW was not an operational limit on the steam turbine.

97. Mr. Swartz testified that the [REDACTED]. [REDACTED] He stated that operation of the steam turbine above 420 MW could be correlated with [REDACTED] but many other factors are involved in determining what a generator can produce.

98. Mr. Swartz stated that the power factor was the key to DEF's ability to operate the steam turbine above 420 MW. Mitsubishi used [REDACTED] with a power factor of [REDACTED] to predict an output of 420 MW. Using the same operating factors, DEF was able to run the steam turbine at a power rating between .97 and .995. Mr. Swartz testified that this increased efficiency enabled the Bartow generator to operate above 420 MW.

99. Mr. Swartz conceded that the [REDACTED]. [REDACTED] [REDACTED] [REDACTED] at least from DEF's perspective. If DEF was able to obtain more, such was to the ultimate benefit of its ratepayers and was consistent with the operating limitations set forth in the Purchasing Agreement.

100. OPC responds that the record of this proceeding contains no indication that at any time during the five-year long, continuous, iterative RCA process did DEF's engineers suggest that the power factor of [REDACTED] in [REDACTED] an indication that the steam turbine output of 420 MW could be safely exceeded.

101. OPC points to several statements recorded during the RCA process indicating that DEF's engineers and Mitsubishi alike acknowledged that 420 MW was the design limit of the steam turbine: [REDACTED]. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

102. OPC's essential criticism was that DEF pushed the Mitsubishi steam turbine beyond its operational limits, whether the issue is framed in terms of megawatts of electrical output beyond the design point or in terms of steam flow [REDACTED]. The evidence was clear that Mitsubishi did not contemplate DEF's operation of the steam turbine beyond the [REDACTED]. The evidence was also clear that DEF made no effort before the fact to notify Mitsubishi of its intended intensity of operation or to ask Mitsubishi whether it could safely exceed the [REDACTED]. Mr. Swartz was unable to explain away this criticism and thus DEF failed to meet its burden of demonstrating that it prudently operated the Bartow Plant during the times relevant to this proceeding.

CONCLUSIONS OF LAW

103. DOAH has jurisdiction of the subject matter of and the parties to this proceeding. §§ 120.569 and 120.57(1), Fla. Stat.

104. The Commission has the authority to regulate electric utilities in the State of Florida pursuant to the provisions of chapter 366, including sections 366.04, 366.05, and 366.06.

105. An "electric utility" is defined as "any municipal electric utility, investor-owned electric utility, or rural electric cooperative which owns, maintains, or operates an electric generation, transmission, or distribution system within the state." § 366.02(2), Fla. Stat.

106. DEF is an investor-owned electric utility operating within the State of Florida subject to the jurisdiction of the Commission pursuant to chapter 366.

107. OPC, FIPUG, and White Springs are parties to the Fuel Clause docket, which included the issues to be resolved here, and as such are entitled to participate as parties in this proceeding.

108. This is a de novo proceeding. § 120.57(1)(k), Fla. Stat. Petitioner, DEF, has the burden of proving, by a preponderance of the evidence, that it acted prudently in its actions and decisions leading up to and in restoring the unit to service after the February 2017 forced outage at the Bartow Plant. Additionally, DEF must prove by a preponderance of the evidence that no adjustment to replacement power costs should be made to account for the fact that after the installation of a pressure plate in March 2017, the Bartow Plant could no longer produce its rated nameplate capacity of 420 MW. *Dep't of Transp. v. J.W.C. Co.*, 396 So. 2d 778, 788 (Fla. 1st DCA 1981); § 120.57(1)(j), Fla. Stat.

109. The legal standard for determining whether replacement power costs are prudent is “what a reasonable utility manager would have done, in light of the conditions and circumstances that were known, or should [have] been known, at the time the decision was made.” *S. Alliance for Clean Energy v. Graham*, 113 So. 3d 742, 750 (Fla. 2013).

110. DEF failed to demonstrate by a preponderance of the evidence that its actions during Period 1 were prudent. DEF purchased an aftermarket steam turbine from Mitsubishi with the knowledge that it had been manufactured to the specifications of Tenaska with a design point of 420 MW of output. Mr. Swartz’s testimony regarding the irrelevance of the 420 MW limitation was unpersuasive in light of the documentation that after the initial blade failure, DEF itself accepted the limitation and worked with Mitsubishi to find a way to increase the output of the turbine to [REDACTED]

111. DEF’s RCA concluded that the blade failures were caused [REDACTED]

[REDACTED] This conclusion is belied by the fact that [REDACTED]

[REDACTED] Mitsubishi cannot be faulted for

[REDACTED] in a way that would allow an operator to run the turbine consistently beyond its capacity.

112. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

113. Mr. Polich persuasively argued that it would have been simple prudence for DEF to ask Mitsubishi about the ability of the turbine to operate continuously in excess of 420 MW output before actually operating it at those levels. DEF understood that the blades had been designed for the Tenaska 3x1 configuration and should have at least explored with Mitsubishi the wisdom of operating the steam turbine with steam flows in excess of those anticipated in the original design.

114. The record evidence demonstrated an [REDACTED] that vibrations associated with high energy loadings were the primary cause of the L-0 blade failures. DEF failed to satisfy its burden of showing its actions in operating the steam turbine in Period 1 did not cause or contribute significantly to the vibrations that repeatedly damaged the L-0 blades. To the contrary, the preponderance of the evidence pointed to DEF's operation of the steam turbine in Period 1 as the most plausible culprit.

115. DEF demonstrated by a preponderance of the evidence that its actions during Periods 2 through 5 were prudent.

116. DEF argues that even if it failed to exercise prudence during Period 1, those actions were so attenuated by DEF's subsequent actions during Periods 2 through 5 that the outage and de-rating that began in 2017 cannot be fairly attributed to DEF's failures from 2009 through March 2012. If the imprudent operation in Period 1 did not cause the Period 5 outage, then the imprudent operation cannot be a basis for disallowance of the replacement power costs at issue.

117. OPC argues that Periods 2 through 5 would not have been necessary had DEF operated the turbine within its original operating limitations during Period 1. OPC contends that, based on [REDACTED], there is every reason to believe that the original L-0 blades would still be functioning but for DEF's overstressing them in Period 1.

118. OPC states that the applicable standard for prudence review is how a prudent and reasonable utility manager would have operated a new steam turbine under the conditions and circumstances which were known, or reasonably should have been known, when decisions were made in 2008 through 2012. OPC argues that it was imprudent and unreasonable for DEF to regularly supply steam to the steam turbine at levels causing the steam turbine to operate above the design point of 420 MW, especially given the fact that the steam turbine was not designed for the Bartow Plant and was sold to DEF with an [REDACTED]

119. It is speculative to state that the original Period 1 L-0 blades would still be operating today had DEF observed the [REDACTED] of 420 MW. It is not speculative to state that the events of Periods 2 through 5 were precipitated by DEF's actions during Period 1. It is not possible to state what would have happened from 2012 to 2017 if the excessive loading had not occurred, but it is possible to state that events would not have been the same.

120. In his closing argument, counsel for White Springs summarized the equities of the situation very well:

You can drive a four-cylinder Ford Fiesta like a V8 Ferrari, but it's not quite the same thing. At 4,000 RPMs, in second gear, the Ferrari is already doing 60 and it's just warming up. The Ford Fiesta, however, will be moaning and begging you to slow down and shift gears. And that's kind of what we're talking about here.

It's conceded as fact that the root cause of the Bartow low pressure turbine problems is [REDACTED]

██████████ caused repeatedly over time. The answer to the question is was this due to the way [DEF] ran the plant or is it due to a ██████████ Well, the answer is both.

The fact is that [DEF] bought a steam turbine that was already built for a different configuration that was in storage, and then hooked it up to a configuration ... that it knew could produce much more steam than it needed. It had a generator that could produce more megawatts, so the limiting factor was the steam turbine.

On its own initiative, it decided to push more steam through the steam turbine to get more megawatts until it broke.

* * *

So from our perspective, [DEF] clearly was at fault for pushing excessive steam flow into the turbine in the first place. The repair which has been established ... may or may not work, but the early operation clearly impeded [DEF's] ability to simply claim that Mitsubishi was entirely at fault. And under those circumstances, it's not appropriate to assign the cost to the consumers.

121. The greater weight of the evidence supports the conclusion that DEF did not exercise reasonable care in operating the steam turbine in a configuration for which it was not designed and under circumstances which DEF knew, or should have known, that it should have proceeded with caution, seeking the cooperation of Mitsubishi to devise a means to operate the steam turbine above 420 MW.

122. Given DEF's failure to meet its burden, a refund of replacement power costs is warranted. At least \$11.1 million in replacement power was required during the Period 5 outage. This amount should be refunded to DEF's customers.

123. DEF failed to carry its burden to show that the Period 5 blade damage and the required replacement power costs were not consequences of DEF's imprudent operation of the steam turbine in Period 1.

124. The de-rating of the steam turbine that required the purchase of replacement power for the 40 MW loss caused by installation of the pressure plate was a consequence of DEF's failure to prudently operate the steam turbine during Period 1. Because it was ultimately responsible for the de-rating, DEF should refund replacement costs incurred from the point the steam turbine came back online in May 2017 until the start of the planned fall 2019 outage that allowed the replacement of the pressure plate with the [REDACTED] in December 2019. Based on the record evidence, the amount to be refunded due to the de-rating is \$5,016,782.

125. The total amount to be refunded to customers as a result of the imprudence of DEF's operation of the steam turbine in Period 1 is \$16,116,782, without interest.

RECOMMENDATION

Based upon the foregoing Findings of Fact and Conclusions of Law, it is RECOMMENDED that the Public Service Commission enter a final order finding that Duke Energy Florida, LLC, failed to demonstrate that it acted prudently in operating its Bartow Unit 4 plant and in restoring the unit to service after the February 2017 forced outage, and that Duke Energy Florida, LLC, therefore may not recover, and thus should refund, the \$16,116,782 for replacement power costs resulting from the steam turbine outages from April 2017 through September 2019.

DONE AND ENTERED this 27th day of April,2020, in Tallahassee, Leon
County, Florida.

Lawrence P. Stevenson

LAWRENCE P. STEVENSON
Administrative Law Judge
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-3060
(850) 488-9675
Fax Filing (850) 921-6847
www.doah.state.fl.us

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Division of Administrative Hearings
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COPIES FURNISHED:

Jon C. Moyle, Jr., Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301
(eServed)

Nickalus Austin Holmes, Commission Deputy Clerk I
Florida Public Service Commission
2450 Shumard Oak Boulevard
Tallahassee, Florida 32399
(eServed)

Matthew Bernier, Esquire
Duke Energy Florida, LLC
Suite 800
106 East College Avenue
Tallahassee, Florida 32301
(eServed)

James Ray Kelly, Public Counsel
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399
(eServed)

Dianne M. Triplett, Esquire
Duke Energy Florida, LLC
299 1st Avenue North
St. Petersburg, Florida 33701
(eServed)

Patty Christensen, Esquire
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399

Stephanie Morse, Esquire
The Florida Legislature
Room 812
111 West Madison Street
Tallahassee, Florida 32399

James Walter Brew, Esquire
Stone Law Firm
Eighth Floor, West Tower
1025 Thomas Jefferson Street Northwest
Washington, DC 20007
(eServed)

Suzanne Smith Brownless, Esquire
Florid Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Thomas A. (Tad) David, Esquire
Office of Public Counsel
Room 812
111 West Madison Street
Tallahassee, Florida 32399-1400
(eServed)

Laura Wynn Baker, Associate
Stone Mattheis Xenopoulos & Brew, P.C.
1025 Thomas Jefferson Street Northwest
Washington, DC 20007
(eServed)

Daniel Hernandez, Esquire
Shutts & Bowen LLP
Suite 300
4301 West Boy Scout Boulevard
Tampa, Florida 33607
(eServed)

Charles John Rehwinkel, Deputy Public Counsel
Florida Office of Public Counsel
111 West Madison Street
Tallahassee, Florida 32399
(eServed)

Karen Ann Putnal, Esquire
Moyle Law Firm, P.A.
118 North Gadsden Street
Tallahassee, Florida 32301
(eServed)

Bianca Y. Lherisson, Esquire
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399
(eServed)

Adam Teitzman, Commission Clerk
Office of the Commission Clerk
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Braulio Baez, Executive Director
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

Keith Hetrick, General Counsel
Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850
(eServed)

NOTICE OF RIGHT TO SUBMIT EXCEPTIONS

All parties have the right to submit written exceptions within 15 days from the date of this Recommended Order. Any exceptions to this Recommended Order should be filed with the agency that will issue the Final Order in this case.

**DUKE ENERGY FLORIDA
Confidentiality Justification Matrix**

DOCUMENT/RESPONSES	PAGE/LINE	JUSTIFICATION
<p>2020 Recommended Order from the State of Florida Division of Administrative Hearings</p>	<p><u>Page 8:</u> The information after “blades in the steam turbine. 13.” and before “14. The Mitsubishi steam turbine” in its entirety</p> <p>The information at the end of the page, after “proposed 4xl combined cycle configuration.” to the end of the page in its entirety</p> <p><u>Page 9:</u> The information at the beginning of the page, before “17. A "heat balance" is” in its entirety</p> <p>The information after “conversion of load current.” And before “19. Jeffrey R. Swartz, DEF's” in its entirety</p> <p>The information after “20.” to the end of the page in its entirety</p> <p><u>Page 10:</u> The information at the beginning of the page, before “24. Mr. Swartz further asserted” in its entirety</p> <p>The information after “power factor exceeding” and before “which would result” in its entirety</p>	<p>§366.093(3)(c), F.S. The document in question contains confidential information, contractual information, or information provided by a third party that DEF is obligated to keep confidential, the disclosure of which would harm its competitive business interests</p>

	<p>The information after “Purchase Agreement, titled” and before “states, in relevant part:” in its entirety</p> <p>The information after “states, in relevant part:” and before “26. The plain language” in its entirety</p> <p>The information at the end of the page, after “section 3.2.1 establishes” in its entirety</p> <p><u>Page 11:</u> The information at the beginning of the page, before “It is unclear” in its entirety</p> <p>The information after “language into a” and before “27. In any event” in its entirety</p> <p>The information after “numbers stated in the” and before “are calculated estimates” in its entirety</p> <p>The information after “conditions that will achieve” and before “output. If DEF was” in its entirety</p> <p>The information after “output in excess of” and before “then it was simply” in its entirety</p> <p>The information after “an operational limitation.” and before “OPC points out” in</p>	
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	<p>its entirety</p> <p>The information after “conducted extensive” and before “(from December 2014 until April 2016)” in its entirety</p> <p>The information after “a document titled” and before “dated March 18, 2015” in its entirety</p> <p>The information after “stated that the” and before “The Report also” in its entirety</p> <p>The information after “stated that the” and before “These statements were supported” in its entirety</p> <p>The information after “which states that” and before “of the steam turbine.” in its entirety</p> <p>The information after “Purchase Agreement, titled” and before “expressly states” in its entirety</p> <p>The information at the end of the page after “expressly states” in its entirety</p> <p><u>Page 12:</u></p> <p>The information at the beginning of the page before “31. OPC notes that” in its entirety</p> <p>The information after “31. OPC notes that” and before</p>	
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	<p>“reached” in its entirety</p> <p>The information after “reached” and before “of output using only” in its entirety</p> <p>The information after “of output using only” and before “OPC further notes” in its entirety</p> <p>The information after “Bartow Plant had a” and before “meaning that it had” in its entirety</p> <p>The information after “ability to produce” and before “of output when” in its entirety</p> <p>The information after “when compared to the” and before “for which the steam” in its entirety</p> <p><u>Page 13:</u></p> <p>The information after “DEF found that” and before “DEF consulted with” in its entirety</p> <p>The information after “blades and recommended” and before “37. Mitsubishi concluded” in its entirety</p> <p>The information after “blades was caused by” and before “Up to this point” in its entirety</p> <p>The information after “Mitsubishi had” and before “DEF and Mitsubishi had”</p>	
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	<p>in its entirety</p> <p>The information after “assumed that if” and before “of the steam turbine” in its entirety</p> <p>The information after “steam turbine, then the” and before “would be acceptable” in its entirety</p> <p>The information after “in March 2012” and before “38. Period 2 commenced” in its entirety</p> <p>The information after “LP Turbine with” and before “39. During Period 2” in its entirety</p> <p>The information located in the footnote “3” at the bottom of the page in its entirety</p> <p><u>Page 14:</u></p> <p>The information after “complied with Mitsubishi's” and before “40. During a planned” in its entirety</p> <p>The information after “Mitsubishi replaced the” and before “used in Period 2 with” in its entirety</p> <p>The information after “used in Period 2 with” and before “thus beginning Period 3.” in its entirety</p> <p>The information after “inspection of</p>	
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	<p>the Period 2” and before “blades. The inspection” in its entirety</p> <p>The information after “inspection revealed a” and before “consistent with ordinary” in its entirety</p> <p>The information after “no damage noted to” and before “There was some” in its entirety</p> <p>The information after “There was some” and before “described as” in its entirety</p> <p>The information after “described as” and before “41. Between Period 2” in its entirety</p> <p>The information after “Mitsubishi and DEF installed” and before “in the steam turbine” in its entirety</p> <p>The information after “turbine to allow for” and before “which they expected” in its entirety</p> <p>The information after “damage and to” and before “protect the equipment.” in its entirety</p> <p>The information after “output, except for a” and before “44. During Period 3” in its entirety</p> <p>The information after “Period 3, Mitsubishi” and</p>	
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	<p>before “steam turbine. The” in its entirety</p> <p><u>Page 15:</u> The information after “turbine experienced approximately” and before “Mitsubishi's fleet” in its entirety</p> <p>The information after “experience had been” and before “on last stage blades” in its entirety</p> <p>The information after “would experience at” and before “45. Mitsubishi concluded that” in its entirety</p> <p>The information after “45. Mitsubishi concluded that” and before “46. It was undisputed” in its entirety</p> <p>The information after “Despite DEF's having” and before “DEF and Mitsubishi's examination” in its entirety</p> <p>The information after “Period 3 revealed that” and before “DEF and Mitsubishi decided that” in its entirety</p> <p>The information after “DEF and Mitsubishi decided that” and before “were installed.” in its entirety</p> <p>The information at the end of the page, after “during this period and” in its</p>	
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	<p>entirety</p> <p><u>Page 16:</u> The information after “established by Mitsubishi” and before “50. It was undisputed” in its entirety</p> <p>The information after “Period 5, DEF and Mitsubishi” and before “53. During Period 5,” in its entirety</p> <p>The information after “established by Mitsubishi” and before “54. On February 9, 2017” in its entirety</p> <p>The information at the end of the page, after “and discovered that a” in its entirety</p> <p><u>Page 17:</u> The information after “DEF concluded that” and before “the rupture disk.” in its entirety</p> <p>The information after “established by Mitsubishi” and before “56. It was undisputed” in its entirety</p> <p>The information after “solution for the steam turbine.” and before “60. Instead, DEF and Mitsubishi” in its entirety</p> <p><u>Page 18:</u> The information after “62. Mitsubishi's” and before “during Period 3” in its</p>	
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	<p>entirety</p> <p>The information after “during Period 3” and before “63. In September 2017” in its entirety</p> <p>The information at the end of the page, after “documented the” in its entirety</p> <p><u>Page 19:</u> The information after “also stated that an” and before “65. After the discovery” in its entirety</p> <p>The information after “66. DEF’s RCA” and before “67.” in its entirety</p> <p>The information after “67.” and before “68. At the hearing” in its entirety</p> <p>The information after “October 15, 2016, DEF” and before “70. The working papers” in its entirety</p> <p><u>Page 20:</u> The information after “Unit 4 L-0 events” was” and before “71. OPC accurately states” in its entirety</p> <p>The information after “the steam turbine, the” and before “72. Mr. Swartz attempted” in its entirety</p> <p>The information after “steam flow because” and before “73. DEF’s final</p>	
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	<p>RCA” in its entirety</p> <p>The information after “a correlation between” and before “and the five failure” in its entirety</p> <p>The information after “RCA pointed out that” and before “74. OPC concludes that” in its entirety</p> <p>The information after “onto Mitsubishi for” and before “DEF contends that” in its entirety</p> <p><u>Page 21:</u></p> <p>The information after “Three vendors responded.” and before “DEF selected the Mitsubishi proposal.” in its entirety</p> <p>The information after “Mitsubishi installed” and before “As of the hearing date” in its entirety</p> <p>The information after “Bartow Plant with the” and before “L-0 blades without incident” in its entirety</p> <p>The information after “that in proposing its” and before “blades, Mitsubishi did” in its entirety</p> <p>The information after “testing of the” and before “blades:” in its entirety</p> <p>The information at the end of the page after “blades:”</p>	
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	<p>in its entirety</p> <p><u>Page 22:</u> The information at the end of the page after “fact that there are” in its entirety</p> <p><u>Page 23:</u> The information at the beginning of the page before “OPC notes that the” in its entirety</p> <p>The information after “not explain why a” and before “84. As to DEF's argument” in its entirety</p> <p>The information after “84. As to DEF's argument that” and before “OPC replies that had” in its entirety</p> <p>The information after “functioning, consistent with” and before “In other words” in its entirety</p> <p>The information after “steam turbine at the” and before “86. Given the lack of experience” in its entirety</p> <p>The information at the end of the page before “nameplate capacity of 420 MW.” in its entirety</p> <p><u>Page 24:</u> The information after “consultant ran over” and before “88. Mr. Polich testified” in its entirety</p> <p>The information after “unit designed for a” and before</p>	
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	<p>“To support his opinion” in its entirety</p> <p>The information after “run past 420 MW,” and before “89. DEF ran the” in its entirety</p> <p>The information after “the design of the” and before “40” L-0 blades that” in its entirety</p> <p>The information after “period, though the” and before “Mr. Polich further” in its entirety</p> <p>The information at the end of the page after “something about the blades” in its entirety</p> <p><u>Page 25:</u></p> <p>The information after “something in the” and before “that caused them” in its entirety</p> <p>The information after “believed that the” and before “He noted that” in its entirety</p> <p>The information after “beyond the usual” and before “92. Mr. Polich thought that” in its entirety</p> <p>The information after “92. Mr. Polich thought that” and before “Mr. Polich did not” in its entirety</p> <p>The information after “could be correlated,” and</p>	
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	<p>before “93. Mr. Polich testified” in its entirety</p> <p><u>Page 26:</u></p> <p>The information after “term as a proxy for” and before “It was his opinion” in its entirety</p> <p>The information after “97. Mr. Swartz testified that the” and before “He stated that operation” in its entirety</p> <p>The information after “be correlated with” and before “but many other factors” in its entirety</p> <p>The information after “Mitsubishi used” and before “with a power factor of” in its entirety</p> <p>The information after “with a power factor of” and before “to predict an output” in its entirety</p> <p>The information after “99. Mr. Swartz conceded that the” and before “at least from DEF's perspective.” in its entirety</p> <p>The information after “the power factor of” and before “in” in its entirety</p> <p>The information after “in” and before “an indication that the” in its entirety</p> <p>The information at the end of the page, before “limit of</p>	
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	<p>the steam turbine:” in its entirety</p> <p><u>Page 27:</u> The information at the beginning of the page, before “102. OPC's essential criticism” in its entirety</p> <p>The information after “in terms of steam flow” and before “The evidence was clear” in its entirety</p> <p>The information after “turbine beyond the” and before “The evidence was also” in its entirety</p> <p>The information after “could safely exceed the” and before “Mr. Swartz was unable” in its entirety</p> <p><u>Page 28:</u> The information after “output of the turbine to” and before “111. DEF's RCA concluded” in its entirety</p> <p>The information after “failures were caused” and before “This conclusion is belied” in its entirety</p> <p>The information after “by the fact that” and before “Mitsubishi cannot be faulted” in its entirety</p> <p><u>Page 29:</u> The information at the beginning of the page, before “in a way that would</p>	
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	<p>allow” in its entirety</p> <p>The information after “112.” and before “113. Mr. Polich” in its entirety</p> <p>The information after “evidence demonstrated an” and before “that vibrations associated” in its entirety</p> <p><u>Page 30:</u> The information after “OPC contends that, based on” and before “there is every reason” in its entirety</p> <p>The information after “and was sold to DEF with an” and before “119. It is speculative” in its entirety</p> <p>The information after “had DEF observed the” and before “of 420 MW.” in its entirety</p> <p>The information at the end of the page before “turbine problems is” in its entirety</p> <p><u>Page 31:</u> The information at the beginning of the page before “caused repeatedly over” in its entirety</p> <p><u>Page 32:</u> The information after “pressure plate with the” and before “in December 2019.” in its entirety</p>	
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Exhibit D

AFFIDAVIT OF JEFFREY SWARTZ

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Fuel and purchased power cost recovery
Clause with generating performance incentive
Factor

Docket No. 20190001-EI

Filed:

**AFFIDAVIT OF JEFFREY SWARTZ IN SUPPORT OF
DUKE ENERGY FLORIDA'S
REQUEST FOR CONFIDENTIAL CLASSIFICATION**

STATE OF FLORIDA

COUNTY OF PINELLAS

BEFORE ME, the undersigned authority duly authorized to administer oaths, personally appeared Jeffrey Swartz, who being first duly sworn, on oath deposes and says that:

1. My name is Jeffrey Swartz. I am over the age of 18 years old and I have been authorized by Duke Energy Florida (hereinafter "DEF" or the "Company") to give this affidavit in the above-styled proceeding on DEF's behalf and in support of DEF's Request for Confidential Classification (the "Request"). The facts attested to in my affidavit are based upon my personal knowledge.

2. I am the Vice President of Florida Generation. I am responsible for the overall leadership and strategic direction of DEF's power generation fleet. My major duties and responsibilities include strategic and tactical planning to operate and maintain DEF's non-nuclear generation fleet; generation fleet project and additions recommendations; major maintenance programs; outage and project management; retirement of generation facilities; asset allocation; workforce planning and staffing; organizational alignment and design; continuous

business improvements; retention and inclusion; succession planning; and oversight of hundreds of employees and hundreds of millions of dollars in assets and capital and operating budgets.

3. DEF is seeking confidential classification for certain information contained in the 2020 Recommended Order from the State of Florida Division of Administrative Hearings, where the final hearing was conducted on February 4-5, 2020. The confidential information at issue is contained in confidential Exhibit A to DEF's Request and is outlined in DEF's Justification Matrix that is attached to DEF's Request as Exhibit C. DEF is requesting confidential classification of this information because it contains confidential information, contractual information, or information provided by a third party that DEF is obligated to keep confidential, the disclosure of which would harm its competitive business interests.

4. In order to contract with third-party vendors and Original Equipment Manufacturers on favorable terms, DEF must keep contractual terms and third-party proprietary information confidential. The disclosure of which would be to the detriment of DEF and its customers. DEF takes affirmative steps to prevent the disclosure of this information to the public, as well as limits its dissemination within the Company to those employees with a need to access the information to provide their job responsibilities. Absent such measures, third-party vendors would run the risk that sensitive business information that they provided would be made available to the public and, as a result, end up in possession of potential competitors. Faced with that risk, persons or companies who would otherwise contract with DEF might decide not to do so if DEF did not keep specific information confidential. Without DEF's measures to maintain the confidentiality of sensitive terms in contracts, the Company's efforts to obtain competitive contracts could be undermined.

5. Additionally, the disclosure of confidential information provided by a third party could adversely impact DEF's competitive business interests. If such information was disclosed to DEF's competitors, DEF's efforts to obtain competitive contracts that add economic value to both DEF and its customers could be undermined.

6. Upon receipt of confidential information from third-party vendors, and with its own confidential information, strict procedures are established and followed to maintain the confidentiality of the terms of the documents and information provided, including restricting access to those persons who need the information to assist the Company. At no time since receiving the contracts and information in question has the Company publicly disclosed that information. The Company has treated and continues to treat the information and contracts at issue as confidential.

7. This concludes my affidavit.

Further affiant sayeth not.

Dated the _____ day of May, 2020.

(Signature)
Jeffrey Swartz
Vice President – Generation Florida

THE FOREGOING INSTRUMENT was sworn to and subscribed before me this ____ day of May, 2020 by Jeffrey Swartz. He is personally known to me or has produced his _____ driver's license, or his _____ as identification.

(Signature)

(AFFIX NOTARIAL SEAL)

(Printed Name)
NOTARY PUBLIC, STATE OF _____

(Commission Expiration Date)

(Serial Number, If Any)