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September 27, 2022

**-VIA ELECTRONIC FILING -**

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

**Re: Docket No. 20220001-EI**

Dear Mr. Teitzman:

On behalf of Florida Power & Light Company ("FPL"), I attach the prepared rebuttal testimony and exhibits of Dean Curtland and Gerald J. Yupp.

Please feel free to contact me with any questions at (561) 304-5795.

Sincerely,

*s/ Maria Jose Moncada*  
\_\_\_\_\_  
Maria Jose Moncada

Attachments

cc: Counsel for Parties of Record (w/ attachments)

:9635739

1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **REBUTTAL TESTIMONY OF DEAN CURTLAND**

4 **DOCKET NO. 20220001-EI**

5 **SEPTEMBER 27, 2022**

6

7 **Q. Please state your name and address.**

8 A. My name is Dean Curtland. My business address is 15430 Endeavor Drive, Jupiter,  
9 FL 33478.

10 **Q. Have you previously filed testimony in this docket?**

11 A. Yes.

12 **Q. Are you sponsoring any rebuttal exhibits?**

13 A. Yes, I am sponsoring the following exhibit:

- 14 • Exhibit DC - 1 – Excerpt from: FPL’s Procedure 0-PME-049.0, Reactor  
15 Trip and Trip Bypass Breaker Inspection Maintenance

16 **Q. What is the purpose of your rebuttal testimony?**

17 A. The purpose of my rebuttal testimony is to respond to the testimony provided by  
18 Richard Polich, P.E. on behalf of the Office of Public Counsel (“OPC”).  
19 Specifically, I address his allegations that: i) FPL activities contributed to the  
20 exciter failure that occurred at Turkey Point Unit 4 on July 5, 2020 and, ii) FPL’s  
21 procedures resulted in the March 1, 2021 reactor trip breaker (“RTB”) failure at  
22 Turkey Point Unit 3.

1 **Q. Please summarize your rebuttal testimony.**

2 A. My testimony explains that FPL reasonably engaged and relied upon the expertise  
3 of Siemens, Inc. to perform preventative maintenance on the exciter housing, and  
4 that FPL carried out additional appropriate inspections. There was no evidence of  
5 deterioration of the seals prior to the event that should have prompted a different  
6 set of actions by FPL. In addition, my testimony explains that, with respect to the  
7 RTB failure, FPL was performing appropriate maintenance of the associated cell  
8 switches. Contrary to Mr. Polich's assertion, applying the vendor's life cycle  
9 recommendation would not have prevented the RTB failure. In sum, FPL's actions  
10 in connection with both of these outages were prudent.

11

12 **JULY 5, 2020 EXCITER FAILURE**

13 **Q. Please describe OPC witness Polich's assessment of the activities that**  
14 **contributed to the exciter failure that occurred on July 5, 2020 at Turkey Point**  
15 **Unit 4.**

16 A. Witness Polich incorrectly asserts that FPL personnel had not properly installed the  
17 exciter seals and failed to inspect the seals during periodic exciter inspections.

18 **Q. Is OPC witness Polich correct in stating that FPL personnel installed the exciter**  
19 **seals?**

20 A. No. FPL personnel did not install the exciter housing. Witness Polich states that he  
21 reviewed FPL's root cause evaluation associated with this outage, but he appears to  
22 have missed the fact that FPL engaged Siemens, the Original Equipment  
23 Manufacturer ("OEM"), to perform routine maintenance on the exciter.

1 **Q. Describe generally the preventative maintenance work performed by Siemens.**

2 **A.** Siemens is engaged to perform preventative maintenance on the exciter at least every  
3 seven and a half years during scheduled refueling outages. When the preventative  
4 maintenance is performed, the exciter housing is completely removed, cleaned,  
5 inspected, and the seals are replaced by Siemens in accordance with their proprietary  
6 procedure.

7 **Q. Is Siemens an appropriate vendor to perform maintenance on the exciter?**

8 **A.** Yes, Siemens is the OEM for this equipment and has the proprietary information  
9 including detailed design drawings, technical specifications, and specialty tooling to  
10 perform this work. In fact, Siemens's expertise applies to every part of the centerline  
11 equipment: the turbine, the generator and the exciter, all of which work together.  
12 Siemens therefore is engaged to perform maintenance work on the entire centerline,  
13 making FPL's engagement of Siemens for exciter work particularly appropriate.

14 **Q. In addition to being the OEM with experience maintaining exciters, what else  
15 made Siemens a qualified vendor?**

16 **A.** Siemens is one of the largest turbine generator manufacturers in the world, serving  
17 both nuclear and non-nuclear plants. This has included on-going maintenance and  
18 refurbishments, power uprates at FPL's nuclear units and new installations. Siemens  
19 also supports over 50% of the existing nuclear generation sites in the United States.

20 **Q. Please describe generally the contractual arrangement that FPL has with  
21 Siemens to perform the work.**

22 **A.** Siemens performs work in our nuclear fleet in a turnkey arrangement. This is an  
23 established process, typical for a nuclear vendor that is highly specialized. There is a

1 large amount of work being performed during the site's refueling outage. To put this  
2 in perspective, a typical refueling outage involves approximately 1,500 additional  
3 contractors from various vendors to complement the full-time staff at the site.  
4 Because this is one focused scope of work, it makes sense to have a turnkey  
5 engagement for a relatively small portion of the overall outage in instances where the  
6 vendor is highly experienced and specialized.

7 **Q. Did FPL review the procedures that Siemens prepared for the exciter work?**

8 A. Yes. Whenever FPL plans work at its nuclear site that is performed by any vendor,  
9 FPL reviews the procedures and processes that the vendor will use. The reviews are  
10 performed by qualified maintenance supervisors and engineers. The vendors use their  
11 procedures but are required to follow any FPL work control program that may apply.

12 **Q. Please describe the exciter work that Siemens was required to perform.**

13 A. During the work on the exciter, the housing was completely removed, cleaned, and  
14 inspected, and the seals are replaced by Siemens in accordance with their procedure.  
15 Siemens's proprietary procedure includes verification points designed to ensure the  
16 seals are properly prepared and installed. That verification step is performed by  
17 Siemens's technical director and is then further verified as part of Siemens's quality  
18 assurance review.

19 **Q. Did these steps occur the last time Siemens performed exciter work before the**  
20 **July 5, 2020 event?**

21 A. Yes. Prior to the July 5, 2020 event, the exciter housing for Unit 4 was removed in  
22 March 2019. During the inspection, Siemens noted that several seals were found to  
23 be hard or torn. All degraded seals were replaced. After the replacement was complete,

1 Siemens inspected the work and noted that the final seals were acceptable for return  
2 to service. At that time, FPL verified that the inspection occurred.

3 **Q. Did the procedures and inspections employed by Siemens satisfy the industry  
4 standard for exciter maintenance?**

5 A. Yes. The procedures provided detailed guidance and satisfied industry standards for  
6 the exciter maintenance.

7 **Q. In addition to the inspections performed by Siemens, please describe the  
8 oversight FPL provided during the exciter maintenance work.**

9 A. Siemens is required to follow FPL's work control program. FPL confirms that  
10 appropriate verifications are included at key points in Siemens's procedures. These  
11 verification points are built into work orders which serve to confirm that all  
12 processes, including those applicable to exciter maintenance work, were completed.

13 **Q. OPC witness Polich describes a 2001 water intrusion event that occurred in the  
14 exciter housing at Turkey Point Unit 3. Mr. Polich concludes that FPL was  
15 therefore aware of the potential for water intrusion into the exciter but failed to  
16 properly install the seals. Please describe the actions FPL took based on the 2001  
17 event.**

18 A. Prior to the 2001 water intrusion event, FPL personnel performed the maintenance  
19 work along with Siemen's contractors. When the event occurred, FPL immediately  
20 contacted Siemens and they performed the restoration of the unit including correcting  
21 the water intrusion. Thereafter, FPL engaged Siemens, as the specialized expert, to  
22 perform the maintenance on the exciter under a turnkey arrangement as discussed  
23 above. When Siemens performed maintenance after the 2001 event, it did so with full

1 knowledge of the potential for water intrusion given that Siemens contractors had  
2 worked on correcting the 2001 water intrusion.

3 **Q. Describe Siemens's track record in performing the exciter maintenance work**  
4 **after the 2001 event.**

5 A. Siemens has performed preventative maintenance using its proprietary procedures at  
6 each Turkey Point nuclear unit and each St. Lucie nuclear unit – four in total – at least  
7 every seven and a half years since 2001. With respect to FPL units alone, this totals at  
8 least eight occasions. Each time the work was performed with a successful outcome.  
9 No water intrusion has occurred. In addition, since 2001, Siemens also has performed  
10 the same type of maintenance on a number of FPL's non-nuclear generation sites that  
11 had exciters, each of which is an outdoor facility. No water intrusion occurred at those  
12 sites following Siemens's preventative maintenance work.

13 **Q. Has Siemens performed exciter maintenance on other outdoor nuclear facilities**  
14 **in the country?**

15 A. Yes. Siemens performs generator and exciter maintenance on a number of outdoor  
16 nuclear units. FPL reviewed the relevant operating experience and did not identify any  
17 other exciter failures due to water intrusion.

18 **Q. What do you conclude regarding the procedures employed by Siemens to**  
19 **perform exciter maintenance?**

20 A. The procedures and tooling material, including seals, employed by Siemens at Turkey  
21 Point Unit 3 are consistent with industry standard for exciter housing at outdoor  
22 nuclear and non-nuclear sites. The Siemens procedures have proven to work in

1 numerous applications. Accordingly, FPL acted reasonably in relying on Siemens's  
2 expertise, including its prior experience at Turkey Point Unit 3.

3 **Q. Please also address OPC witness Polich's claim that FPL failed to inspect the**  
4 **seals during periodic exciter inspections to ensure the seals function properly,**  
5 **and that seals required to prevent water intrusion must be inspected on a**  
6 **"regular basis".**

7 A. Mr. Polich's statement that seals must be inspected on a "regular basis" ignores reality.  
8 After the exciter housing is installed, the seals are between two surfaces and are not  
9 only inaccessible, they are not even visible. The exciter seals *cannot* be inspected  
10 while the unit is online because the exciter itself is rotating and energized at high  
11 voltage. In addition, there are no recommended OEM inspection requirements while  
12 the unit is online.

13 **Q. Does this mean FPL performs no inspections of the exciter housing seals?**

14 A. Not at all. FPL inspects the exciter housing seals during every refueling outage, which  
15 occur every 18 months. At that time, the seals and gasketed surfaces are inspected  
16 where accessible. FPL's inspections of the housing surfaces search for any evidence  
17 of water intrusion.

18 **Q. What is your conclusion regarding FPL's inspection practices?**

19 A. FPL inspects the exciter housing at reasonable intervals in a manner that is consistent  
20 with industry practice.

21

22



1 **Q. What do you conclude regarding FPL’s actions and decisions with respect to**  
2 **the work performed on the exciter prior to the July 5, 2020 event?**

3 A. FPL engaged a highly qualified vendor to perform the maintenance and  
4 replacement work on the exciter housing pursuant to procedures that produced  
5 successful results at many sites over time. FPL acted prudently in its oversight and  
6 verification of the vendor’s work on the exciter.

7

8 **MARCH 1, 2021 REACTOR TRIP BREAKER FAILURE**

9 **Q. Please describe the circumstances related to the Reactor Protection Testing**  
10 **that impacted Turkey Point Unit 3 on March 2, 2021.**

11 A. In March 2021, Turkey Point Unit 3 performed a planned test of the Reactor  
12 Protection System. The test restoration phase included closing and opening the 3B  
13 reactor trip breaker (“RTB”). A cell switch – essentially a plunger that is depressed  
14 by the force of the breaker being inserted into position – is used for the turbine trip  
15 logic to validate the breaker position. During testing, the unit experienced an  
16 automatic shutdown. FPL was not able to determine the exact cause but observed  
17 hardened graphite grease on the cell switch which caused it to remain closed and  
18 not correctly validate the breaker position.

19 **Q. Please respond to OPC witness Polich’s assertion that FPL contributed to the**  
20 **March 1, 2021 event at Turkey Point Unit 3 because it failed to follow the**  
21 **Westinghouse prescribed Maintenance Program Manual (“MPM”).**

22 A. FPL disagrees. Mr. Polich appears to conflate replacement recommendations with  
23 maintenance procedures. The Westinghouse MPM recommendation that FPL did not

1 follow at the time of the event – and still does not follow – is the replacement of the  
2 cell switches after 100 cycles. Because the cell switch is used only to validate the  
3 breaker position, they remain closed at all times except during testing which occurs  
4 quarterly, or four times a year. Following the Westinghouse MPM recommendation  
5 would mean that FPL would replace cell switches only once every 25 years.  
6 Therefore, implementing that practice would not have prevented the accumulation of  
7 lubricant around the cell switch.

8 **Q. If FPL does not follow the Westinghouse MPM recommendation on cell switch**  
9 **life cycles, what process was in place to monitor proper function of the cell**  
10 **switch?**

11 A. FPL tests and inspects the cell switches every 18 months. If the cell switch shows  
12 signs of deterioration, FPL would replace it at that time. This testing and inspection  
13 interval is more frequent than Westinghouse’s maintenance recommendation. FPL’s  
14 maintenance program is more conservative than the 25-year interval for cell switch  
15 replacement recommended by Westinghouse. A review of the documentation of  
16 FPL’s maintenance, provided as Exhibit DC-1, shows that the cell switches, including  
17 the one involved in the March 1, 2021 event, were reliable and had no failures.

18 **Q. Has FPL determined why the cell switch failed on March 1, 2021?**

19 A. As the root cause evaluation indicates, the cause remains undetermined. As part of  
20 investigation, the RTB was sent to the OEM, Westinghouse, to conduct extensive  
21 inspections and testing to determine the root cause of the failure. However, the root  
22 cause was found to be undetermined. Overall, the RTB was found to be in excellent  
23 condition and cycled 50 times at Westinghouse without an issue. The RTB cubical

1 cell switch was also thoroughly tested without an issue. Although all the inspection  
2 points for contacts and spring load were found satisfactory, during disassembly the  
3 cubical cell switch was found to have aged grease. The aged grease was the only  
4 anomaly identified. Therefore, it was considered a “*possible* cause of failure”.

5 **Q. Did FPL review operating experience at other nuclear sites to determine whether**  
6 **there has been any reactor trips during cell switch testing?**

7 A. Yes. Review of industry operating experience found no similar cases where a cell  
8 switch caused such an issue. In addition, conferring with other nuclear operators  
9 confirmed that the FPL maintenance procedures match industry standards and  
10 practice.

11 **Q. Since the cause of the outage was undetermined, did FPL nevertheless update its**  
12 **processes?**

13 A. Yes. As a corrective action, the FPL procedures were updated to add a requirement  
14 to clean the switches every 18 months, in addition to testing and inspection.  
15 Previously, the removal and cleaning of the cell switches was a conditional  
16 requirement, meaning it was removed and cleaned only if an inspection indicated  
17 those steps were required based on inspection results.

18 **Q. What do you conclude regarding FPL’s actions and decisions with respect to**  
19 **the work performed on the exciter prior to the March 1, 2021 event?**

20 A. FPL acted prudently with respect to the maintenance of the cell switch. FPL  
21 adhered to Westinghouse’s recommended maintenance procedures and instituted  
22 even more conservative testing and inspection intervals. FPL’s maintenance  
23 program was also aligned with industry standard.

1 Q. Does this conclude your rebuttal testimony?

2 A. Yes, it does.

REVISION NO.: 9	PROCEDURE TITLE: REACTOR TRIP AND TRIP BYPASS BREAKER INSPECTION AND MAINTENANCE	PAGE: 78 of 157
PROCEDURE NO.: 0-PME-049.01	TURKEY POINT PLANT	<u>INITIAL</u>

  

**4.25** **Cubicle Inspection (continued)**

**7.** **INSPECT** switchgear cubicle for the following:

- A.** **INSPECT** control wiring for integrity of insulation and tightness of connections. ag
- B.** IF any control wiring is found loose, THEN **TIGHTEN** connections and **RECORD** any abnormal findings in Section 5.2, Step 1. ag
- C.** **VERIFY** left and right interior rail assemblies are **NOT** distorted. ag
- D.** **VERIFY** edges of rail assembly where breaker wheels roll are **NOT** mushroomed, rounded off, or bent inward or outward. ag
- E.** **REPLACE** rails, if necessary. ag
- F.** **VERIFY** breaker element levering pins welded on each rail are intact and undistorted. ag
- G.** **VERIFY** breaker release latch **NOT** bent and touches bottom of cell rail. ag
- H.** **PRESS** release latch by hand to its limit and **VERIFY** release latch springs back when released. ag
- I.** Cell positioning stop bracket **NOT** distorted. ag
- J.** Switchgear that the secondary contact assembly phenolic material **NOT** cracked. ag
- K.** Switchgear secondary contact assembly conductive surface **NOT** abnormally or unevenly worn. ag
- L.** Ground contact **NOT** corroded, **NOT** loose, and surface **NOT** abnormally or unevenly worn. ag
- M.** **REMOVE** cell switch covers. ne
- N.** **VERIFY** cell switch contacts are clean. ne
- O.** IF cell switch contacts require cleaning or lubrication, THEN:
  - (1)** **CLEAN** with a cloth and isopropyl alcohol. ne
  - (2)** **APPLY** grease (G77). ne

REVISION NO.: 9	PROCEDURE TITLE: REACTOR TRIP AND TRIP BYPASS BREAKER INSPECTION AND MAINTENANCE	PAGE: 79 of 157
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**4.25** **Cubicle Inspection (continued)**

~~7.~~ **(continued)**

~~P.~~ **PRESS** spring-loaded plunger several times and **VERIFY** smooth and unbinding operation of switch. nl

~~Q.~~ With spring-loaded plunger pressed, **VERIFY** correct contact configuration and contact resistance using a ohmmeter. nl

Functional Criteria: 1 ohm or less

~~R.~~ With spring-loaded plunger released, **VERIFY** correct contact configuration and contact resistance using a ohmmeter. nl

Functional Criteria: 1 ohm or less

~~S.~~ **INSTALL** cell switch covers. nl

89

1                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2                   **FLORIDA POWER & LIGHT COMPANY**

3                   **REBUTTAL TESTIMONY OF GERARD J. YUPP**

4                   **DOCKET NO. 20220001-EI**

5                   **SEPTEMBER 27, 2022**

6

7   **Q.     Please state your name and address.**

8   A.     My name is Gerard J. Yupp. My business address is 700 Universe Boulevard,  
9            Juno Beach, Florida, 33408.

10 **Q.    By whom are you employed and what is your position?**

11 A.     I am employed by Florida Power & Light Company (“FPL”) as Senior Director  
12           of Wholesale Operations in the Energy Marketing and Trading Division.

13 **Q.    Have you previously testified in this docket?**

14 A.     Yes.

15 **Q.    What is the purpose of your testimony?**

16 A.     The purpose of my rebuttal testimony is to respond to the assertion by OPC  
17           witness Richard A. Polich that FPL’s calculations of replacement power costs  
18           related to the July 2020 outage of Turkey Point Unit No. 4 and the March 2021  
19           outage of Turkey Point Unit No. 3 were not calculated correctly.

20 **Q.    In your role as Senior Director of Wholesale Operations in the Energy**  
21 **Marketing and Trading Division, are you responsible for calculating**  
22 **replacement power costs?**

23 A.     Yes, for over ten years, I have been responsible for calculating FPL’s replacement

1 power costs and have employed essentially the same methodology throughout  
2 that time.

3 **Q. Please describe FPL’s methodology for calculating replacement power costs**  
4 **related to nuclear unit outages.**

5 A. FPL’s methodology for calculating replacement power costs is straightforward,  
6 requires no assumptions, and is based on the actual generation mix and fuel cost  
7 data for the applicable period that is reported on the A-Schedules that are filed  
8 with, and available for review by, the Florida Public Service Commission on a  
9 monthly basis. The replacement costs are derived using actual fuel cost data as  
10 reported on Schedule A3 for the applicable period. The fuel cost data is converted  
11 to a weighted average dollar per MWh replacement value based on the proportion  
12 of all other fuels that were used to generate replacement power during the outage  
13 period. Fixed costs associated with natural gas are removed from the total natural  
14 gas costs prior to being incorporated into the weighted average allocation because  
15 these costs would have been incurred regardless of whether the outage occurred.  
16 This unit replacement value is applied to all of the outage MWh to derive the  
17 gross replacement power costs. FPL then subtracts nuclear fuel costs that would  
18 have been incurred, “but for” the outage, to arrive at the total net replacement  
19 power costs. The data that is used for this calculation is verifiable by reviewing  
20 the A-Schedules. The methodology is sound, auditable, and appropriate for this  
21 purpose.



1 **Q. OPC witness Polich asserts that the calculation of replacement power costs**  
2 **related to specific outages should be calculated using actual hourly**  
3 **incremental values as opposed to average values. Do you agree with his**  
4 **assertion?**

5 A. No. First, witness Polich does not offer any details to support how he believes  
6 these “incremental” costs would be calculated. He fails to mention that any  
7 attempt to calculate hourly data would be based on a hypothetical system dispatch  
8 and hypothetical fuel procurement that attempts to conceive what would have  
9 happened absent the specific outage. Unlike the calculation FPL prepares which  
10 is based on actuals, witness Polich’s approach would introduce these types of  
11 assumptions into the methodology which inherently threatens the credibility of  
12 the analysis. This type of analysis would not result in improved accuracy, as  
13 witness Polich seems to suggest.

14 **Q. Does witness Polich’s suggested approach differ from the standard fuel**  
15 **cost recovery methodology?**

16 A. Yes. Fuel cost recovery factors are set based on a hypothetical system dispatch  
17 utilizing inputs such as projected fuel prices, projected load, overhaul schedules,  
18 and unit parameters. Final recovery, however, is based on actual fuel costs which  
19 is the methodology FPL has utilized in determining replacement power costs.  
20 Witness Polich’s methodology deviates from what is reported on the A-  
21 Schedules and therefore, creates a mismatch between FPL’s actual reported costs  
22 and the hypothetical costs created for the purpose of calculating replacement  
23 power costs.

1 Q. Does this conclude your rebuttal testimony?

2 A. Yes, it does.