

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 120009-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: NUCLEAR POWER PLANT COST RECOVERY AMOUNT
TO BE RECOVERED DURING THE PERIOD
JANUARY - DECEMBER 2013

REBUTTAL TESTIMONY OF:

ALBERT M. FERRER

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5 **July 9, 2012**

6 **Q. Please state your name and business address.**

7 A. My name is Albert M. Ferrer. My business address is 800 Kinderkamack Road,
8 Oradell, New Jersey 07649.

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

10 A. I am employed by Burns and Roe Enterprises, Inc. (BREI) as Vice President, Power
11 Consulting Division.

12 **Q. Have you previously submitted direct testimony in this proceeding?**

13 A. Yes, I submitted direct testimony in this proceeding on March 1, 2012.

14 **Q. What is the purpose of your rebuttal testimony in this proceeding?**

15 A. The purpose of my rebuttal testimony is to address certain positions of the Florida Public
16 Service Commission Staff relating to Florida Power & Light (FPL) and FPL contractor
17 performance during FPL's Extended Power Uprate (EPU) outages.

18 **Q. Did BREI conduct a review of FPL's management actions with respect to the**
19 **February 2011 work stoppage caused by a Siemens personnel error?**

20 A. Yes. BREI investigated FPL's management actions associated with this event.

21 **Q. Please describe the BREI review of the work stoppage resulting from work**
22 **performed by Siemens on the St. Lucie Unit 2 turbine generator rewind.**

1 A. In February 2011, Siemens inadvertently left an alignment pin inside the generator stator
2 which caused core iron damage during subsequent testing. The alignment pin is a metal
3 rod about 13 inches long and less than an inch in diameter, which was left in one of the
4 hundreds of long, narrow ventilation holes inside a very large electric generator
5 component weighing many tons. Siemens repaired the damage on an expedited basis.
6 Following repairs, the generator was retested and determined to be satisfactory.

7
8 To better understand the information available to FPL at the time decisions were made,
9 and the reasonableness of FPL's management actions. BREI conducted a due diligence
10 assessment of this issue. BREI sent two senior BREI engineers with decades of nuclear
11 power plant experience to interview three FPL management employees who participated
12 in the oversight of the EPU outage and Siemens' generator rewind activities. BREI also
13 independently reviewed FPL's pre-contract award qualification process, the inspection
14 and checks performed by FPL during the rewind process, FPL's root cause evaluation
15 (RCE) report, the procedures and processes employed by Siemens and by FPL at the time
16 of the St. Lucie Unit 2 generator rewind work, and the testing procedures employed by
17 Siemens.

18 **Q. Please describe BREI's overall conclusion regarding FPL's oversight of Siemens**
19 **generator rewind work on the St. Lucie Unit 2.**

20 A. Based on its review, BREI concluded that FPL's oversight of the generator rewind
21 project was prudent, reasonable, and appropriate based on information available at the
22 time management decisions were made.

1 **Q. What is the basis for BREI's conclusion that FPL's management decisions were**
2 **reasonable?**

3 A. There are many facts that demonstrate that FPL's management decisions were
4 reasonable. First, FPL management retained the services of Siemens, the original
5 equipment manufacturer, which has successfully performed generator rewinds on eleven
6 units – including six nuclear units – as the most experienced and expert firm to conduct
7 the generator rewind. With respect to past experience, Siemens has a solid positive
8 reputation within the power generation industry and is regarded by BREI to be
9 experienced and qualified in performing the generator upgrades required by FPL. In
10 selecting Siemens, FPL management appropriately considered its own previous
11 experience with Siemens, as well as experience at other nuclear power facilities.

12
13 Second, prior to commencement of the work, FPL management reviewed Siemens' work
14 control processes and procedures for compliance with quality assurance requirements in
15 accordance with FPL fleet procedure NA-AA-201. This procedure is in compliance with
16 industry standards and addresses the 18 criteria contained in Nuclear Regulatory
17 Commission regulations governing Quality Assurance for Nuclear Power Plants
18 (10CFR50 Appendix B). In some instances, FPL management required Siemens to adopt
19 FPL's processes and procedures.

20
21 Third, FPL management provided Siemens with adequate guidance and resources to
22 perform its work.

23

1 Fourth, FPL conducted site-specific training, and FPL management was assured that
2 Siemens' workers were trained on Siemens processes and procedures. The contractors
3 who performed the generator rewind were qualified, trained, briefed, and instructed
4 consistent with accepted nuclear industry practice.

5
6 Fifth, FPL management conducted random and periodic observations of Siemens' on-
7 going work during which discrepancies were identified and corrected. This shows
8 appropriate active and engaged vendor management on FPL's part. FPL held Siemens to
9 the same high level of performance expectations as it applied to other contractors and
10 FPL personnel. FPL did not reduce or relax its performance expectations standards for
11 Siemens personnel on the generator rewind task. Based on BREI's experience, FPL's
12 oversight of Siemens' generator rewind work was equivalent or greater than the oversight
13 afforded other similar work activities with similar risk profiles in the nuclear power
14 industry. FPL assigned an experienced lead engineer with a team of 8 FPL personnel per
15 shift during the generator upgrade. BREI's experience is that most utilities assign an
16 experienced lead engineer with a team of two or three personnel per shift.

17
18 Sixth, it is consistent with industry practice that when such errors occur, work is stopped,
19 workers are retrained to prevent recurrence, and comprehensive short- and long-term
20 corrective actions are implemented. After the event occurred, FPL ensured that the work
21 was stopped, that workers were retrained, and that corrective actions were implemented.

1 **Q. Please describe the results of BREI’s review of the procedures and processes**
2 **employed by Siemens and FPL at the time of the St. Lucie Unit 2 generator rewind**
3 **work.**

4 A. BREI reviewed the tool control and foreign material exclusion (FME) procedures in
5 effect at the time of the event. Based on this review, BREI concluded that these
6 procedures were reasonable and consistent with those in use at other nuclear power
7 generating plants in the U.S. As is appropriate based upon applicable nuclear industry
8 standards, Siemens’ procedures did not require formal, “operating room” style FME
9 controls at the time of the stator core work since the work area was open to visual
10 inspection.

11 **Q. Please describe the testing procedures used by Siemens after the St. Lucie Unit 2**
12 **stator core work and FPL’s oversight of the testing process.**

13 A. Subsequent to the initial generator stator core upgrade work, Siemens conducted a series
14 of tests. Interpreting the results of these tests was the responsibility of the system expert;
15 in this case, Siemens. FPL participated in the post-upgrade testing process and
16 appropriately relied on Siemens’ experience and expertise for interpreting test results.
17 FPL’s oversight of the test process, and its reliance on Siemens’ expertise and
18 experience, was consistent with industry practice.

19 **Q. Please describe BREI’s review of FPL’s Root Cause Evaluation relating to the St.**
20 **Lucie Unit 2 stator core work.**

21 A. BREI conducted a review of FPL’s final RCE relating to the St. Lucie Unit 2 stator core
22 issue. The scope and rigor of the RCE was consistent with nuclear power industry
23 standards.

1 **Q. Did the RCE identify any industry precedent suggesting that this type of event could**
2 **have occurred?**

3 A. No. A search of the industry operating experience database by FPL during the root cause
4 evaluation process did not reveal any prior incidents associated with the use of generator
5 alignment pins that would have prompted the implementation of more rigorous oversight
6 and/or control measures.

7 **Q. Is Staff correct to rely on conclusions in the Root Cause Evaluation as a basis for**
8 **recommending a disallowance?**

9 A. No. Staff's recommended disallowance relies on after the fact observations and
10 statements in the Root Cause Evaluation. This is far different from examining
11 information available to FPL at the time decisions were made, which is the process that
12 BREI undertook.

13 **Q. In its Audit Report, the Commission Staff made reference to certain 1994 U.S.**
14 **Department of Energy (DOE) guidelines. Is Staff correct to rely on these guidelines**
15 **for their recommended disallowance?**

16 A. No. We reviewed DOE-STD-1069-94, "Guideline To Good Practices for Maintenance
17 Tools and Equipment Control at DOE Nuclear Facilities." This is a 1994 guideline for
18 establishing the inventory and control of tools at DOE nuclear facilities like nuclear
19 weapons facilities, not nuclear generating plants. The guidelines are not applicable at all
20 to the work that is the subject of Staff's recommended disallowance.

21 **Q. Even if the DOE guidelines were applicable, did FPL's conduct violate them?**

22 A. No. FPL's and Siemens's execution of the work on the St. Lucie Unit 2 turbine was
23 consistent with the DOE guidelines, even if they were applicable. Proper tools were

1 available and in good condition for use in the rewind activity. FPL has a tool room
2 process which uses an electronic database for tracking the issuance and return of tools
3 and periodic inspection and testing of the tools to ensure they remain safe and suitable for
4 their applications. Siemens also has a tool inventory control program for ensuring the
5 availability and reliability of the correct and necessary tools for maintenance personnel.
6 The process established by FPL and Siemens for maintenance tools and equipment
7 control, Siemens procedure FSP-083, was consistent with the DOE guidelines even if
8 they were applicable, which they are not, and was not a contributor to this event.

9 **Q. Did FPL management follow applicable industry standards with respect to Foreign**
10 **Material Exclusion during the generator rewind?**

11 A. Yes. Relevant industry standards are established by the Institute of Nuclear Power
12 Operations (INPO) and the Electric Power Research Institute (EPRI). These standards
13 are nowhere addressed in Staff's recommended disallowance.

14
15 FPL Nuclear Fleet Procedure MA-AA-101-1000, "Foreign Material Exclusion
16 Procedure" is in accordance with the guidance and good practices contained in INPO 07-
17 008 "Guidelines for Achieving Excellence in Foreign Material Exclusion" and EPRI TR-
18 106756, "Foreign Material Exclusion Guidelines." FPL's review of Siemens FME
19 controls for the generator rewind project ensured agreement with FPL's FME procedure,
20 and thus consistency with the applicable INPO and EPRI standards.

21
22 INPO and EPRI industry guidance makes clear that formal tool accountability is not the
23 applicable standard where a final visual inspection before closure is possible. This was

1 the case for the stator core work. Therefore, the Siemens work activities and FME
2 controls for replacing the core iron were consistent with FPL, INPO, and EPRI guidance
3 since the generator components were completely accessible for inspection prior to the
4 electrical testing. Furthermore, the visual inspections, although not prescriptively
5 described in procedures, are considered skill-of-the-craft since the “winders” are Siemens
6 craftsman (permanent employees) who were trained and qualified by Siemens for this
7 particular work. Their level of experience in generator rewinds is provided in the Root
8 Cause Evaluation. Since visual inspection is conducted by craftsmen on an almost
9 continuous and on-going basis, tool accountability during this stage of the work would
10 have been redundant.

11 **Q. Based on BREI’s investigation and your training and experience managing and**
12 **performing work in the nuclear industry, are you confident that FPL’s management**
13 **actions with respect to managing Siemens and the stator core work were reasonable**
14 **based on the information available to FPL at the time decisions were made?**

15 A. Yes, I am.

16 **Q. Does this conclude your rebuttal testimony?**

17 A. Yes.