

March 20, 2014

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Commission

In the Matter of	)	
	)	
Florida Power & Light Company	)	Docket No. 50-389
	)	
(St. Lucie Plant, Unit 2)	)	

**DECLARATION OF MR. RUDY GIL IN SUPPORT OF FPL’S ANSWER  
OPPOSING SACE MOTION TO STAY RESTART**

Mr. Rudy Gil states as follows under penalty of perjury:

**I. INTRODUCTION**

**A. Declarant Background**

1. I am the Corporate Manager of Programs for the NextEra Energy, Inc. nuclear fleet. My educational background and qualifications include receiving a Bachelor of Science in Civil Engineering in 1978 from the University of Miami. I have held a Professional Engineer License from the State of Florida since 1982 and received a Senior Reactor Operator Management Certification in 2000. I have been employed by the Florida Power & Light Company (“FPL”) Nuclear Division since 1978. I have held various engineering positions with increasing responsibility, including Corporate Chief Civil Engineer, Design Engineering Manager and Systems Engineering Manager for the St. Lucie Nuclear Plant; Assistant Maintenance Manager at the Turkey Point Nuclear Plant; and my current position as Corporate Programs Engi-

neering Manager. In my current position, which I have held since 1998, I am responsible for the health of the engineering programs for the NextEra Energy, Inc. nuclear fleet. This includes ownership of the steam generator program for each of our pressurized water reactor sites, including St. Lucie. I have been active in the resolution of various nuclear industry issues. Examples of significant industry committees include the Nuclear Energy Institute task forces for Reactor Head Drop Analysis, Buried Piping and Fukushima Flooding. In addition, I am a member of the Electric Power Research Institute Advisory Committee for Materials Management and the Executive Oversight Committee for the Pressurized Water Reactor Materials Management Program. These committees provide guidance and oversight for industry initiatives related to reactor coolant system materials programs, including steam generator management.

**B. SACE’s Motion to Stay Restart of St. Lucie Unit 2**

2. I have reviewed and am familiar with Southern Alliance for Clean Energy’s (“SACE”) motion to stay the restart of the St. Lucie Unit 2 reactor, which was filed with the Secretary on March 10, 2014.<sup>1</sup> I am also familiar with the Declaration provided by Mr. Arnold Gundersen in support of SACE’s motion for stay.<sup>2</sup>
3. My Declaration addresses SACE’s erroneous claim that the restart of the St. Lucie Unit 2 nuclear reactor without a hearing would pose an undue risk to public health

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<sup>1</sup> Southern Alliance for Clean Energy’s Motion to Stay Restart of St. Lucie Unit 2 Pending Conclusion of Hearing Regarding *De Facto* Amendment of Operating License and Request for Expedited Consideration (Mar. 10, 2014) (“SACE Motion”).

<sup>2</sup> Declaration of Arnold Gundersen (Mar. 9, 2014), Attachment 1 to Southern Alliance for Clean Energy’s Hearing Request Regarding *De Facto* Amendment of St. Lucie Unit 2 Operating License (Mar. 10, 2014) (“Gundersen Decl.”).

and safety due to steam generator tube wear. SACE Motion at 7. As set forth in this Declaration, the tube wear at St. Lucie Unit 2 has been identified and studied, the root cause is well understood, and FPL (and the NRC) has taken the steps necessary to ensure safe operation of the plant.

4. My Declaration also addresses SACE's erroneous implication that the tube wear at St. Lucie is similar to tube wear that led to the shutdown of the San Onofre Nuclear Generating Station ("SONGS"). SACE Motion at 2; Gundersen Decl. at ¶ 36. Significant differences between the design of the St. Lucie 2 and SONGS steam generators, as well as differences in the type of tube wear experienced, make such a comparison inappropriate and misleading.

## **II. TUBE WEAR AT ST. LUCIE UNIT 2 AND FPL'S RESPONSE**

5. This section of my Declaration provides a brief history of tube wear in the St. Lucie Unit 2 replacement steam generators and the actions undertaken to ensure safe operation of that Unit.
6. Inspections performed after the first cycle of operation for the St. Lucie 2 steam generators identified a number of tube-to-anti-vibration bar ("AVB") wear indications in the U-bend area. As required by FPL's Steam Generator Management program and the Unit's technical specifications, operational assessments for the second cycle of plant operation were prepared. Based on those assessments, no tubes required plugging for the second cycle. However, FPL conservatively plugged all tubes (14) with a wear level greater than 25%.
7. Inspections performed after the second cycle of operation identified an increased number of tube wear indications, as predicted by the operational assessments. Wear

rates, however, decreased during the second cycle as also predicted. Based on the operational assessment prepared after the second cycle, one tube required plugging. FPL conservatively plugged an additional 20 tubes.

8. As predicted by the operational assessment performed after the second cycle, inspections performed after the third cycle again identified an increased number of indications. Wear rates, however, continued to decrease as also predicted. The indications were limited to the same three regions of the tube bundle where indications were found after the first and second cycles. Seven tubes required plugging during this inspection, and FPL conservatively plugged an additional 112 tubes.
9. These inspections found no tube-to-tube wear in St. Lucie Unit 2's steam generators. Only tube-to-AVB wear occurred.
10. The root cause of the tube wear at St. Lucie Unit 2 is well understood. The comprehensive root cause evaluation conducted by AREVA for FPL, and reviewed by an independent third party, concluded that the U-tubes were not effectively supported during the tubing installation process. The tube bundle was allowed to sag, causing slight deformation of the AVBs, which in turn closed the tube-to-AVB gap. This condition caused tubes to be in constant contact with AVBs at several locations, contrary to the design specification and models. The resulting tube-to-AVB contact allowed tube wear in the affected tubes/areas. However, as expected based on this root cause, the tube wear has attenuated over time and is manageable under FPL's Steam Generator Management program.
11. On February 25, 2011, FPL requested a license amendment to permit an extended power uprate at St. Lucie Unit 2. Letter from Richard L. Anderson, Site Vice Pres-

ident, St. Lucie Plant, to NRC, L-2011-021 (Feb. 25, 2011) (ADAMS Accession No. ML110730116). At that time, and taking into account the root cause evaluation, analyses were performed by AREVA for FPL that demonstrated acceptable tube wear at power uprate conditions, the NRC considered the results of these analyses when it evaluated and approved the St. Lucie Unit 2 power uprate on September 24, 2012. Letter from J. Sam Armijo, Chairman, ACRS, to R.W. Borchardt, NRC Executive Director of Operations (Jul. 23, 2012), at 4 (ADAMS Accession No. ML12198A202); Letter from Tracy J. Orf, Project Manager, Plant Licensing Branch 11-2, to Mano Nazar, Executive Vice President and Chief Nuclear Officer, Florida Power and Light Company (Sept. 24, 2012) (ADAMS Accession No. ML12235A463).

12. St. Lucie Unit 2's first cycle of operation under the power uprate conditions has been completed. FPL is currently conducting an inspection of its steam generator tubes. The implementation of this inspection is being monitored by NRC representatives on site as part of their normal oversight process.

### **III. THERE ARE SIGNIFICANT DESIGN DIFFERENCES BETWEEN ST. LUCIE AND SONGS**

13. SACE is wrong when it implies that the situation leading to the shutdown of SONGS Units 2 and 3 is similar to events at St. Lucie Unit 2. SACE Motion at 2; Gundersen Decl. at ¶ 36.
14. Tube-to-tube wear in the in-plane direction caused the SONGS tube leak that culminated in that plant's shutdown. In contrast, after three full cycles of operation

St. Lucie Unit 2 has not experienced tube-to-tube wear, and there is no reason to believe that such wear will occur at St. Lucie Unit 2.

15. The type of tube-to-tube wear that occurred at SONGS had never been seen before in a commercial nuclear power plant. In contrast, the tube-to-AVB wear experienced at St. Lucie Unit 2 is well-known and understood in the nuclear industry. As a result, FPL was able to rely on well-developed industry standards that have been proven successful over many, many years of cumulative industry experience to address tube-to-AVB wear and to ensure safe operation of St. Lucie Unit 2.
16. The cause of the tube leak that occurred at SONGS is not a concern at St. Lucie Unit 2, in large part because of various design differences between the steam generators at those plants, which were designed and built by different vendors. Exhibit A to this Declaration provides a detailed list of those differences. Due to these differences, the St. Lucie Unit 2 steam generators have not experienced, and are not expected to experience, the high steam velocity and void fraction (steam to water ratio) conditions that led to the in-plane “fluid elastic” vibration of steam generator tubes at SONGS.

I declare under penalty of perjury that the foregoing is true and correct.

Executed in Accord with 10 C.F.R. § 2.304(d)  
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## Exhibit A

The differences between the St. Lucie Unit 2 and SONGS steam generators include:

1. The steam generators are designed and built by different vendors;
2. The retainer bar feature that resulted in tube wear for the SONGS steam generators is not included in the St. Lucie Unit 2 design;
3. The AVB systems are different (number of sets and arrangement), which leads to different flow patterns;
4. Maximum void fraction in the SONGS steam generators is higher than that of St. Lucie Unit 2;
5. Based on nominal plant power output, it can be concluded that the mean kinetic energy at the U-bend outlet for St. Lucie Unit 2 is significantly less than at SONGS, even after implementation of the power uprate;
6. The St. Lucie Unit 2 tube lane width is minimized, which positively impacts the by-pass flow, which can exist in this particular area without tubes;
7. The St. Lucie Unit 2 tube lane area of each Tube Support Plate presents not only rectangular shape holes but also drilled holes that can favor the mixing between fluid in the tube lane and fluid in the tube bundle;
8. Considering items 3, 4, and 5 above, the SONGS flow pattern departs from the classical flow pattern expected in the U-bend of an AREVA steam generator.