

UNITED STATES OF AMERICA
BEFORE THE NUCLEAR REGULATORY COMMISSION

In the Matter of:)

Florida Power & Light Co.)

St. Lucie Plant, Unit 2)

Docket No. 50-389

December 3, 2014

**SOUTHERN ALLIANCE FOR CLEAN ENERGY’S
REPLY TO ANSWERS BY FLORIDA POWER & LIGHT CO. AND
NRC STAFF TO SECOND AMENDED HEARING REQUEST**

Pursuant to 10 C.F.R. § 2.309(h)(2)¹, Southern Alliance for Clean Energy (“SACE”) hereby replies to answers by Florida Power & Light Co. (“FPL”) and the U.S. Nuclear Regulatory Commission (“NRC”) Staff to SACE’s Motion to Amend Hearing Request With Second Supplemental Declaration of Arnold Gundersen (Nov. 6, 2014) (“SACE Motion”). Florida Power & Light Company’s Answer Opposing Southern Alliance for Clean Energy’s Second Motion Etc. (Nov. 26, 2014); NRC Staff Answer to Southern Alliance for Clean Energy’s Motion for Leave to Amend, Etc. (Dec. 1, 2014) (“NRC Staff Answer”). FPL’s and the Staff’s objections to SACE’s Motion are without merit, and therefore the Motion should be granted.

The purpose of SACE’s Motion was to present an analysis by SACE’s expert, Arnold Gundersen, of the results of a March 2014 inspection by FPL of the St. Lucie Unit 2 replacement steam generators. *See* Second Supplemental Declaration of Arnold Gundersen (Nov. 6, 2014) (“Gundersen Second Supplemental Declaration”) (citing letter from FPL to the NRC re: St. Lucie Unit 2, Docket No. 50-389, Refueling Outage SL2-21,

¹ As in previous pleadings in this proceeding, SACE notes that as a technical matter, neither 10 C.F.R. § 2.309(h)(2) nor any other part of 10 C.F.R. § 2.309 applies in this case because the NRC has not established a deadline for submission of hearing requests. Nevertheless, SACE has addressed these standards because they provide reasonable guidance for the fair and efficient consideration of SACE’s Motion.

Steam Generator Tube Inspection Report (Sept. 18, 2014) (ML14279A237) (“2014 S.G. Inspection Report”)). FPL’s and the Staff’s primary argument in opposition to Mr. Gundersen’s declaration is that it is not timely because the information on which he relies was previously available. FPL Answer at 3 (citing Declaration of Mr. Rudy Gil in Support of FPL’s Answer Opposing SACE Request for Hearing, par. 25 (April 28, 2014) (“Gil Declaration”)); NRC Staff Answer at 3 (citing letter from Farideh E. Saba, NRC, to FPL (August 8, 2014) (ML14189A090) (“Saba Letter”)). These assertions are plainly incorrect.

First, Mr. Gil makes only broad generalizations about the results of the 2014 steam generator inspection, and does not provide any supporting data. He states, for example, that:

(a) steam generator wear continues to be manageable within the St. Lucie Unit 2 steam generator program; (b) no tube integrity issues were identified . . . (d) the tube wear was not unexpected; average and statistical wear rates were at approximately 2012 levels notwithstanding power uprate.

Gil Declaration, par. 25. SACE was not required to accept Mr. Gil’s generalizations, but was entitled to reach its own conclusions based on the data collected during the inspection. As the data provided by FPL in the 2014 S.G. Inspection Report show, the number of damaged tubes in Steam Generator A increased in 2014 by more than 400 to 3,217, now amounting to more than one third of the tubes in that steam generator. *See* attached Reply Declaration of Arnold Gundersen (Dec. 3, 2014), par. 10. Whether or not FPL claims to have “expected” the degree of damage discovered in the 2014 inspection, in Mr. Gundersen’s independent expert opinion, it is significant.² In fact, the level of damage

² This significant increase in steam generator degradation also illustrates FPL’s error in asserting that the information in the 2014 S.G. Inspection Report “is not materially different from *any* previously available.” FPL Answer at 4 (emphasis added).

experienced by the St. Lucie steam generators is unique among U.S. reactors, both on a yearly and cumulative basis. *Id.* Only the two San Onofre reactors had a comparable degree of steam generator tube damage, and those reactor are now closed. *See* Gundersen Second Supplemental Declaration, Figure 1.

The NRC Staff also errs in asserting that SACE could have relied on the FPL data published in the Saba Letter. *See* NRC Staff Answer at 3. By the Staff's own admission, these data were merely "preliminary." Staff Answer at 3. And not only were they preliminary, they were also unreliable: the Saba letter significantly underreported both 2012 and 2014 tube degradation levels. Gundersen Reply Declaration, par. 10. Therefore to use these incorrect data in an analysis of steam generator tube degradation rates would have yielded distorted and incorrect results. *Id.*

The significant errors in the Saba Letter and the discrepancies between the Saba Letter and the 2014 S.G. Inspection Report also raise disturbing questions about the effectiveness and reliability of FPL's steam generator inspection program, especially in light of the fact that FPL claimed to have completed 95% of the inspection when it reported the data in the Saba Letter. Gundersen Reply Declaration, par. 11. As Mr. Gundersen concludes, these questions should have been addressed before the NRC implicitly amended FPL's operating license to allow replacement of the Unit 2 steam generators. *Id.*

Accordingly, FPL's and the Staff's arguments are without merit. The Commission should consider Mr. Gundersen's Second Supplemental Declaration and admit SACE's contention.

Respectfully submitted,

(Electronically signed by)

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Dec. 3, 2014

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St. Lucie Plant, Unit 2)
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Docket No. 50-389

December 3, 2014

**REPLY DECLARATION BY ARNOLD GUNDERSEN
REGARDING SECOND AMENDED HEARING REQUEST**

Under penalty of perjury, I, Arnold Gundersen, hereby declare as follows:

1. My name is Arnold Gundersen. I am Chief Engineer for Fairewinds Associates, a paralegal services and expert witness firm. I have been retained by Southern Alliance for Clean Energy (SACE) to evaluate safety and licensing issues related to the replacement steam generators (RSGs) that Florida Power & Light Co. (FPL) installed in the Unit 2 St. Lucie nuclear reactor in 2007.
2. On November 6, 2014, I prepared a Second Supplemental Declaration setting forth my evaluation of FPL's recently released report of the results of the Unit 2 steam generator inspection that FPL conducted during the spring 2014 refueling outage. FPL's report, which I have referred to as "2014 S.G. Inspection Report," is attached to a letter from FPL to the U.S. Nuclear Regulatory Commission (NRC) dated September 18, 2014 (ML14279A237). As presented in Tables 1 and 2 of my Second Supplemental Declaration, the 2014 S.G. Inspection Report shows total damage to Steam Generator A and Steam Generator B as follows:

Year	SG	Total # of tubes damaged	% of tubes damaged (8,999 total)	Change since previous year	% increase over previous inspection
2012	A	2,809	31%		
2014	A	3,217 ¹	35%	+408	15%
2012	B	1,656	18%		
2014	B	1,938	22%	+282	17%

3. In Table 3 of my Second Supplemental Declaration, I also presented FPL's data regarding more serious damage to steam generators, *i.e.*, damage of 20% and above:

Year	SG	Total # of tubes damaged 20% or more	% of tubes damaged (8,999 total)	Change since previous year	% increase over previous inspection
2012	A	599	7%		
2014	A	700	8%	+101	17%
2012	B	126	1.4%		
2014	B	157	1.7%	+31	23%

¹ Note, that Table 1 of my Second Amended Declaration presented this number as 3,207, and I have since reviewed the data again and corrected it to 3,217.

4. As discussed in my Second Supplemental Declaration, it is my professional opinion that both the overall rate and the >19% rate of steam generator tube degradation at St. Lucie Unit 2 raise significant concerns about the safety of the steam generators. *See* pars. 13-19.
5. In responding to my Second Supplemental Declaration, the NRC Staff claims that I have not explained how the information in the 2014 S.G. Inspection Report (which is presented above) is materially different from “preliminary” information given by FPL to the NRC Staff and publicly disclosed by the Staff in August 2014. *See* NRC Staff Answer to Southern Alliance for Clean Energy’s Motion for Leave to Amend Hearing Request with Second Supplemental Declaration of Arnold Gundersen at page 7 (Dec. 1, 2014). This preliminary information is described in attachments to a letter from Farideh E. Saba, NRC, to FPL (August 8, 2014) (“Saba Letter”). The NRC Staff posted the Saba Letter on ADAMS (ML14189A090) on August 12, 2014.
6. The difference between the “preliminary” FPL data attached to the Saba Letter and the final data presented in the 2014 S.G. Inspection Report is both self-evident and significant. At the outset, the data presented in the Saba Letter is concededly “preliminary.” In addition, the data presented in the Saba Letter are incomplete. For example, the Saba Letter does not include any breakdown of steam generator tube damage by severity. In contrast, the 2014 S.G. Inspection Report shows tube damage by category of severity – 1-19%, 20-39%, and over 39%.
7. Even more importantly, the final data presented in the 2014 S.G. Inspection Report shows much more significant steam generator damage than the data presented in the table attached to the Saba Letter.² While the table of steam generator inspection data attached to the Saba Letter shows that 2,523 steam generator tubes in Steam Generator A displayed wear during the 2014 inspection,

² The table is entitled “NRC Conference Call St. Lucie Unit 2 Steam Generator Inspection March 2014.” Saba Letter, Enclosure 2, Attachment 1 at 2.

the final report shows that in reality, 3,217 tubes were degraded. *See* 2014 S.G. Inspection Report, Attachment 1, Enclosure 1 at page 1 (12 tubes damaged 40-60%); Enclosure 2 at page 25 (700 tubes damaged 20-39%); Enclosure 3 at page 85 (2,505 tubes damaged 1-19%). This amounts to 694 additional tubes showing wear (or 28% more) than are accounted for in the Saba Letter.

8. Similarly, while the table attached to the Saba Letter asserted that 1,787 tubes in Steam Generator B showed wear, the 2014 S.G. Inspection Report shows that 1,938 tubes are damaged. *See* 2014 S.G. Inspection Report, Attachment 1, Enclosure 8 at page 4 (157 tubes damaged 20-39%); Enclosure 9 at page 60 (1,781 tubes damaged 1-19%). This amounts to 151 additional tubes showing wear (or 8% more) not accounted for in the Saba Letter.
9. In addition, the table attached to the Saba Letter reports erroneous data from 2012, thus distorting the comparison between 2012 and 2014. For 2012, the table shows 2,216 damaged tubes in Steam Generator A and 1,529 damaged tubes in Steam Generator B. The correct 2012 figures, as reported by FPL, are 2,809 damaged tubes in Steam Generator A and 1,654 damaged tubes in Steam Generator B. This information is provided in a May 6, 2013 letter from FPL to the NRC (ML13141A479). *See* Attachment 1. For Steam Generator A, Enclosure 1 at page 21 of 21 shows 599 tubes damaged between 20 and 100% and Enclosure 2 at page 73 of 73 shows 2,210 tubes damaged between 1 and 19%. For Steam Generator B, Enclosure 7 at page 4 of 4 shows 126 tubes damaged between 20% and 100% and Enclosure 8 at page 48 of 48 shows 1,528 tubes between 1% and 19%.
10. The following table shows (a) how the erroneous 2012 and 2014 data attached to the Saba Letter resulted in underreporting of 2012 steam generator tube damage and its increase in 2014 and (b) the discrepancy between the 2014 data presented in the Saba Letter in March 2014 and the 2014 data reported in September in the 2014 S.G. Inspection Report:

Year	SG	Total # of tubes damaged		% of tubes damaged (8,999 total)		Change since previous year		% increase over previous inspection	
		March ¹	Sept.	March	Sept.	March	Sept.	March	Sept.
2012	A	2,216	2,809 ²	25%	31%				
2014	A	2,523	3,217 ³	28%	36%	+307	+408	14%	17%
2012	B	1,529	1,656 ²	17%	18%				
2014	B	1,787	1,938 ³	20%	22%	+258	+282	17%	17%

¹ Source of data: table attached to Saba Letter

² Source of data: FPL May 6, 2013 letter to NRC and 2012 S.G. Inspection Report

³ Source of data: FPL September 18, 2014 letter to NRC and 2014 S.G. Inspection Report

As shown by the table above, FPL significantly under-reported the degree of both the 2012 and 2014 steam generator damage in its March 2014 telephone call, especially with respect to Steam Generator A. Instead of 28% of tubes damaged in Steam Generator A, 36% of the tubes are now damaged. Instead of a 14% increase over the last refueling outage, the increase in tube damage in Steam Generator A is 17%. This is a significant discrepancy. As discussed in paragraphs 15 and 16 of my Second Supplemental Declaration, no other operating nuclear reactor in the country has such a serious rate of tube degradation or cumulative amount of degradation. The fact that a 17% increase is within the 24% anticipated by FPL does not make it acceptable from a safety standpoint.

11. The errors in FPL's 2012 tube degradation data as reported in the Saba Letter and the discrepancy between the preliminary data reported by FPL in March 2014 and the final data reported by FPL in September 2014 also indicates that there is something seriously wrong with FPL's steam generator inspection program. First, with respect to the 2012 data, it appears that FPL subtracted from the total number of degraded tubes the number that were most seriously damaged, *i.e.*,

20% or greater damage. Perhaps FPL did this because it planned to plug the tubes. But subtracting that number results in an undercount of the number of damaged tubes. FPL could have and should have provided an accurate accounting of the number of tubes damaged in 2012.

12. Second, the discrepancies between the 2014 data in the Saba Letter and the 2014 data in the Steam Generator Inspection Report are disturbing, especially in light of representations made in the Saba Letter about the comprehensiveness of the inspection and the reported data at that time. In the summary of the March 2014 conference call that is attached to the Saba Letter, the NRC states that:

the licensee [FPL] indicated that at the time of the call, the bobbin coil inspections were greater than 95% complete in both SG A and SG B, and that the remaining uninspected tubes were low row tubes (where not much degradation has been observed).

Saba Letter, Enclosure 2 (Conference Call Summary) at page 2. This statement raises several questions:

- If it is true that in March of 2014, (a) FPL had obtained and reported 95% of the inspection data regarding Steam Generators A and B and (b) the other 5% of un-obtained or unreported data were in locations unlikely to change the result:
 - Why are the final results so different?
 - What went wrong with the inspection and/or FPL's evaluation of the data?
- When FPL finally submitted the 2014 S.G. Inspection Report in September 2014, why didn't FPL alert the NRC Staff of the significant difference between the final report and the preliminary results FPL had reported in March 2014? Even if the growth of damage was within the predicted amount, the change was still significant.
- Finally, why hasn't the NRC Staff raised a concern with FPL about the significant discrepancy between FPL's March 2014 representations and the data in the 2014 S.G. Inspection Report from September?

These issues should have been resolved before the NRC Staff gave its implicit approval to the replacement of the St. Lucie Unit 2 steam generators.

I declare that under penalty of perjury that the testimony submitted in this proceeding is true and correct to the best of my knowledge. The facts presented in this declaration are true and correct to the best of my knowledge, and the opinions expressed are based on my best professional judgment.

Executed in Accord with 10 CFR 2.304 (d).

(Electronically signed)

A handwritten signature in black ink, appearing to read "Arnold Gundersen", is written over a horizontal line.

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Date: December 3, 2014

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CERTIFICATE OF SERVICE

I certify that on December 3, 2014 I served copies of the foregoing SOUTHERN ALLIANCE FOR CLEAN ENERGY'S REPLY TO ANSWERS BY FLORIDA POWER & LIGHT CO. AND NRC STAFF TO SECOND AMENDED HEARING REQUEST on the parties to this proceeding by posting it on the NRC's Electronic Information Exchange.

(Electronically signed by)

Diane Curran