UNITED STATES OF AMERICA
BEFORE THE NUCLEAR REGULATORY COMMISSION

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| In the Matter of: | ) | |
| *Florida Power & Light Co.* | ) | Docket No. 50-389 |
| St. Lucie Plant, Unit 2 | ) | May 5, 2014 |
| | ) | |

**SOUTHERN ALLIANCE FOR CLEAN ENERGY'S REPLY TO OPPOSITIONS TO SACE'S HEARING REQUEST REGARDING *DE FACTO* AMENDMENT OF ST. LUCIE UNIT 2 OPERATING LICENSE**

## I. INTRODUCTION

Pursuant to CLI-14-04 (April 1, 2014), the Southern Alliance for Clean Energy ("SACE") hereby replies to the responses by Florida Power & Light Co. ("FPL") and the U.S. Nuclear Regulatory Commission ("NRC") Staff to SACE's Hearing Request Regarding De Facto Amendment of St. Lucie Unit 2 Operating License (March 10, 2014) ("Hearing Request").[1] Their responses effectively confirm SACE's contention that the NRC Staff secretly approved the operation of St. Lucie Unit 2 with replacement steam generators ("RSGs") whose safety design differed drastically from the original operating license.[2] Neither FPL nor the NRC Staff denies that the Staff amended FPL's operating license to approve the use of the re-designed

[1] Florida Power & Light Company's Answer Opposing Southern Alliance for Clean Energy's Hearing Request Regarding *De Facto* License Amendment of St. Lucie Unit 2 Operating License (Apr. 28, 2014) ("FPL Answer"); NRC Staff Answer to Southern Alliance for Clean Energy's Hearing Request Regarding *De Facto* Amendment of St. Lucie Unit 2 Operating License (Apr. 28, 2014) ("NRC Staff Answer").

[2] The RSG design changes, which have never been fully described in any public document, are partially listed in an internal FPL document submitted with FPL's Answer. *See* Declaration of William Cross, ¶ 10 and Exhibits A and B, "Design Basis Document" ("DBD") Revs. 1 and 2 respectively. The DBD confirms that FPL removed the stay cylinder, substituted tube support plates for anti-vibration bars for the tube support lattice bars that were installed in the original steam generators ("OSGs"), and installed of steam outlet nozzle venturis. Nevertheless, the DBD is not complete because it does not mention the addition of 588 tubes, the perforation of the tubesheet with 588 corresponding holes, or the location of the holes on the tubesheet. *See* Gundersen Declaration, ¶ 31.

RSGs. But they contend the Staff did so openly and lawfully, in the course of approving the extended power uprate ("EPU") for St. Lucie Unit 2 in 2012. FPL Answer at 22, NRC Staff Answer at 8-9. Their argument fails as a matter of law, however, because the Federal Register notice for the EPU license amendment proceeding gave no indication that design changes to the steam generators were the subject of the EPU proceeding. Thus, the NRC Staff failed to give the public notice required for legitimate approval of the re-designed RSGs. *Yankee Atomic Electric Co.* Yankee Nuclear Power Station), CLI-04-28, 60 NRC 412, 415 (2004). Also in violation of the law, the NRC Staff waited to amend the Unit 2 operating license to approve the RSG design changes until *five years after FPL had installed the RSGs,* thereby flouting its statutory obligation to give prior notice and opportunity for a hearing on reactor license amendments. *Citizens Awareness Network v. NRC,* 59 F.3d 284, 294-95 (1st Cir. 1995) (citing 42 U.S.C. § 2242).[3] Moreover, FPL and the Staff have failed to refute SACE's showing that the Staff's proceeding for the amendment of the St. Lucie operating license is ongoing.

Accordingly, FPL's and the NRC Staff's responses to SACE's Hearing Request establish that the NRC Staff has allowed FPL to operate St. Lucie Unit 2 far outside the bounds of the law, both with respect to the substantive terms of its operating license and the length of time it has operated without a lawfully issued license. Furthermore, Unit 2's operating experience during the seven years since the RSGs were installed indicates that the design changes secretly approved by the NRC have put public safety at risk, by causing an unprecedented degree of denting in the

[3] This Reply incorporates information from SACE's Amended Hearing Request and attached Supplemental Declaration of Arnold Gundersen ("Supplemental Gundersen Declaration), filed on April 25, 2014. SACE is aware that FPL and the Staff did not have an opportunity to respond to SACE's Amended Hearing Request in their responses filed on April 28. In the interest of making a complete record, SACE will discuss in this Reply the relevance of information raised in its Amended Hearing Request. FPL and the Staff have an opportunity to respond to these arguments when they respond to the Amended Hearing Request.

steam generator tubes. While FPL claims that the high degree of tube denting stems from other causes, the fact remains that in the original 1983 Final Safety Analysis Report ("OFSAR") for Unit 2, FPL explicitly disavowed the type of tube supports now used in the RSGs on the ground that they were too likely to cause denting. *See* Declaration of Arnold Gundersen, ¶ 25 (March 9, 2014) ("Gundersen Declaration").[4]

SACE respectfully submits that not only have FPL and the Staff failed to demonstrate that Contention 1 is inadmissible, but their responses provide enough information to permit a ruling on the merits that the NRC Staff did indeed unlawfully amend FPL's operating license to approve the substantial re-design of the RSGs in 2012, without providing public notice; and that the process of amending the license continues. In addition, FPL and the Staff have failed to demonstrate that Contention 2 is inadmissible. FPL's own statements in the OFSAR that the type of tube supports now used by FPL would be "eliminated" as unsafe (Gundersen Declaration, ¶ 25 (quoting OFSAR at 5.4-13)), coupled with the high degree of denting in the RSGs since they were installed, conclusively establish that the contention should be admitted.

In conducting the hearing that is required in this proceeding, the Commission should take all measures necessary to address the harm caused by the NRC Staff's and FPL's disregard for the public participation requirements of the Atomic Energy Act. Had they conducted the business of amending FPL's operating license in an open and timely way, SACE and other members of the public would have been entitled to a prior hearing before the new RSGs could be installed. And had the RSG design changes been fully vetted in a hearing, it is possible that FPL

[4] Notably, FPL completely fails to address the substantive content of the OFSAR or even mention it, other than to characterize it as an "outdated UFSAR." *See, e.g,* FPL Answer at 3, 10, 21, 22, 23, 26, 27. The OFSAR was never lawfully updated with respect to the steam generator design, however. Thus, with respect to the steam generator design, it remains the only validly approved version of the FSAR.

would not have been allowed to remove or replace major safety components. Therefore the high degree of damage that has occurred to the St. Lucie Unit 2 steam generator tubes may have been avoided. Now that the *de facto* amendment of the Unit 2 operating license has been disclosed, and in light of the vulnerable condition of the St. Lucie Unit 2 steam generators, the Commission should restore the integrity of the prior hearing process and order that St. Lucie not be permitted to operate the re-designed RSGs until the public has been heard and an informed decision has been reached on the safety concerns raised by the *de facto* license amendment and the performance of the RSGs during the past seven years. *Citizens Awareness Network,* 59 F.3d at 294-95.[5]

## II. DISCUSSION

### A. Not Only is Contention 1 Admissible, but FPL and the NRC Staff Have Effectively Conceded That SACE's Claim of a *De Facto* License Amendment Is Correct.

Not only is Contention 1 admissible, but the information provided by FPL and the NRC Staff in their Answers establishes that Contention 1's claim of a *de facto* license amendment is correct. The license amendment process began years ago with the EPU proceeding and continues with the NRC Staff's periodic safety findings regarding FPL's inspections of the Unit 2 RSGs. Moreover, while FPL claims that the changes to the RSG design are bounded by the original safety analysis, this claim is neither documented nor sufficient to show that the design changes could have been made without a license amendment.

[5] SACE notes that in contrast to St. Lucie Unit 2, the process for replacing the Unit 1 steam generators appears to have been conducted in compliance with the Atomic Energy Act. In that case, FPL installed RSGs that were substantially similar to the OSGs. SACE believes that unusual measures for the restoration and protection of the integrity of the hearing and licensing processes are necessary only with respect to the unique circumstances of the replacement of the Unit 2 steam generators.

### 1. FPL's and the Staff's responses confirm that the NRC amended FPL's operating license in secret.

FPL and the Staff concede that the NRC amended the operating license for St. Lucie Unit 2 to allow FPL to operate the reactor beyond the authority of its 1983 operating license as described in the OFSAR.[6] But they argue that the RSG re-design was lawfully approved as part of the 2012 EPU proceeding. FPL Answer at 22, NRC Staff Answer at 8. FPL (albeit without the concurrence of the NRC Staff) even reaches back farther, claiming that a 2007 license amendment proceeding also encompassed the RSG design changes. FPL Answer at 22. Accordingly, FPL and the Staff contend that SACE missed its chance to request a hearing on the license amendment. FPL Answer at 13, NRC Staff Answer at 9.[7]

FPL and the Staff dismally fail to demonstrate, however, how SACE could have known that the purpose of either license amendment proceeding was to review a set of significant design changes to the Unit 2 steam generators. Neither of the NRC hearing notices for those license amendment proceedings even uses the term "steam generator" let along explains that the NRC was proposing to approve major changes to the design of the steam generators. Under the Administrative Procedure Act and NRC case law, SACE was entitled to notice of the subject

[6] FPL repeatedly refers to the OFSAR as an "outdated UFSAR." *See, e.g,* FPL Answer at 3, 10, 21, 22, 23, 26, 27. The OFSAR was never lawfully updated with respect to the steam generator design, however. Thus, with respect to the steam generator design, it remains the only validly approved version of the FSAR.

[7] For this reason, they also argue that SACE fails to meet the NRC's timeliness requirements. FPL Answer at 13-14, NRC Staff Answer at 21-22. Because the NRC is in fact conducting a proceeding, and because SACE submitted its Hearing Request within a reasonable time of learning of the existence of the proceeding and the nature of the design changes involved, SACE's hearing request is timely.

matter of those proceedings rather than obligated to guess. *Yankee Atomic Electric Co.* Yankee Nuclear Power Station), CLI-04-28, 60 NRC 412, 415 (2004).[8]

Even assuming for purposes of argument that the NRC could have required SACE to divine the subject matter of those proceeding from the license amendment requests ("LARs") submitted by FPL rather than the hearing notice, neither LAR presents a request for approval of FPL's significant design changes to the RSGs, as required by 10 C.F.R. § 50.90.[9] The 2006 LAR for changes to the steam generator inspection program does not describe the steam generator design changes at all, other than to acknowledge the addition of 588 new generator tubes. LAR at 8 (ML061510346). The LAR completely fails to identify the other modifications to the design of the RSGs, *i.e.,* removing the stay cylinder, perforating the tubesheet with 588 additional holes (including the location of those holes on the tubesheet), substituting plates for eggcrate tube supports, or installing steam nozzle venturis. *See* Gundersen Declaration, ¶ 31; Gundersen Supplemental Declaration, ¶¶ 4-7. Nor do they contain any analysis whatsoever of how those design changes would affect the safety of the operation of the steam generators, *i.e.,* with respect to stability of the steam generators and the flow of coolant in the steam generators. As discussed in Mr. Gundersen's declarations, these design changes to the RSGs have allowed

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[8] The Staff is quite capable of noticing license amendment proceedings to review steam generator replacements. *See, e.g.,* 70 Fed. Reg. 35,737 (June 21, 2005), providing notice of the proposed amendment of the operating license for Beaver Valley Unit 1 to install RSGs.

[9] 10 C.F.R. § 50.90 provides that:

> Whenever a holder of a license, including a construction permit and operating license under this part . . . desires to amend the license or permit, application for an amendment must be filed with the Commission, as specified in §§ 50.4 or 52.3 of this chapter, as applicable, *fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.*

(emphasis added).

Unit 2 to operate in a manner not reasonably anticipated in the original St. Lucie license, including the creation of new safety risks that did not exist under the original license terms. *Id.*

Similarly, FPL's 2011 LAR for the EPU provides only limited information about the design of the RSGs, and completely fails to identify, in a comprehensive or systematic way, the design features of the OSGs that FPL removed or changed in the RSGs. The following text from the LAR, which claims to be a description of the RSGs, illustrates the impossibility of identifying the RSG design changes from the LAR:

> The generic current licensing basis (CLB) provided in LR [Licensing Report] Section 2.2.2 applies to the SG and its supports, with the following amplifications.
>
> The SGs are vertical shell and U-tube heat exchanger with integral moisture separating equipment. The reactor coolant flows through the inverted U-tubes, entering and leaving through the nozzles located in the lower head of the SG. Steam is generated on the shell side and flows upward through the moisture separators to the outlet nozzle at the top of the vessel. Steam is then passed through the moisture separator reheaters, turbine, and the condenser. Condensate is returned to the SGs via the feed pumps and the feedwater heaters. There are two SGs.
>
> UFSAR Section 5.4.2.1.1 states that all pressure boundary materials used in the SGs are selected and fabricated in accordance with the requirements of Section III of the ASME Code. A general discussion of materials specifications is given in UFSAR section 5.2.3, with types of materials listed in UFSAR Tables 5.2-3.
>
> The Code Class 1 components of the SG meet the fracture toughness requirements of the ASME Code and 10 CFR 50 Appendix G as discussed in UFSAR Subsection 5.2.3.3.1. Fracture toughness data for the SG materials is presented in UFSAR Tables 5.2-8, 5.2-10, and 5.2-11.
>
> The SG contains 8999 U-tubes for heat transfer for primary to secondary water. Each tube is expanded into the tube sheet so that there are no voids or crevices occurring along the entire length of the tube sheet interface. The tubes are also welded to the Ni-Cr-Fe alloy clad on the reactor coolant surface of the tubesheet. The tube to tubesheet welding conforms with the requirements of the ASME Code, Sections III and IX. Support for the tube bundles are by stainless steel broached tube support plates. Additional support is provided by stainless steel anti-vibration bars to prevent excessive flow-induced vibration.
>
> UFSAR Section 5.4.2.1.3 states that the SG tubes are fabricated from Inconel 690 to insure compatibility with both primary and secondary waters. This section also addresses

> localized corrosion which has led to SG tube leakage in some operating plants. Alloy 690 tubes are less susceptible to various forms of degradation. This section also addresses a corrosion phenomenon known as "denting". The potential for tube denting has been reduced in the SGs by the installation of tube support plates and anti-vibration bars system that are stainless steel with a high chromium content that forms a tight adherent oxide layer. This combination eliminates the potential for denting.
>
> UFSAR Section 5.4.2.2 states that the SGs are inspected per the requirements of Section XI of the ASME Code. The reactor coolant pressure boundary (RCPB) Inservice Inspection and Testing is described in UFSAR Section 5.2.4.
>
> UFSAR Section 5.4.14.2 states that the SG is supported at the bottom of a sliding base bolted to an integrally attached conical skirt. The sliding base rests on low friction bearings which allow unrestrained thermal expansion of the reactor coolant system (RCS). Two keyways within the sliding base guide the movement of the SG during the expansion and contraction of the RCS and, together with a stop and anchor bolts, prevent excessive movement of the bottom of the SG during seismic events and following a loss of coolant accident (LOCA).
>
> A system of keys and snubbers located on the upper end guide the top of the SG during expansion and contraction of the RCS and provide restraint during seismic events and following a LOCA or a steam line break.

EPU Licensing Report at 2.2.2-58 – 2.2.2-59 (DATE) (ML110730299). Worse, the text of the LAR misleadingly implies that the RSGs were built to the same design as the OSGs, which were still in place when the NRC renewed the operating license for Unit 2:

> *In addition to the licensing basis described in the UFSAR, the SGs and supports were evaluated for St. Lucie Unit 2 License Renewal.* For License Renewal, evaluation boundaries were established for mechanical systems to identify those systems or portions of systems that are in the scope of License Renewal. *Those systems determined to be in scope were then screened to identify which components required an aging management review. This process is described in Section 2.1.2 of NUREG-1779, Safety Evaluation Report Related to the License Renewal of St. Lucie Nuclear Plant, Units 1 and 2, dated September 2003. Section 2.3.1.6 of the SER identifies that components of the SGs and supports are within the scope of License Renewal.* Programs used to manage the aging effects associated with the SGs and supports are discussed in SER Section 3.1.6 and Chapter 18 of the UFSAR.

EPU LAR at 2.2.2-59 (emphasis added).

Thus, the EPU LAR not only failed to identify the design changes to the RSGs, but misleadingly implied that the RSG design was essentially the same as the OSG design that had been approved at the time of license renewal. Accordingly, SACE had no way to identify, from any publicly available document, the nature of the changes made by FPL to the Unit 2 steam generators.

The only document identified by either party that lists the RSG design changes is an internal undated FPL "Design Basis Document" ("DBD") that FPL claims to have first prepared in March of 2007 and revised in 2010 for the purpose of changing the components covered by its Aging Management Program ("AMP"). FPL Answer at 19, Cross Declaration, ¶ 10; and Exhibits A and B. Handwritten notes on the 2007 DBD constitute the *only* documentation how FPL changed the design of the Unit 2 steam generators – although even that document is not complete, because it does not identify the 588 additional perforations to the tubesheet or explain where on the tubesheet the perforations were made. But there is no record that the DBD was ever submitted to the NRC.[10] Instead, it appears that the NRC learned about the RSG design changes by reviewing the DBD or some other internal FPL document at the reactor site. Such a secret exchange of information simply does not qualify as a license amendment proceeding, however. *See Yankee, supra,* 60 NRC at 415; 10 C.F.R. § 50.90.

The NRC Staff also claims that FPL was entitled to modify the list of safety components covered by the AMP without seeking a license amendment because the components are not part of the technical specifications. NRC Staff Answer at 33-34. Whether or not these components actually are listed in the technical specifications, there can be no doubt that (a) 10 C.F.R.

[10] At SACE's request, the staff of the NRC's Public Document Room ("PDR") searched for the 2007 and 2010 revisions to the DBD but did not find either document.

§54.21(a)(1) required FPL to list the components subject to the AMP in its license renewal application and (b) the NRC based its approval of the renewal of FPL's operating license for Unit 2 on FPL's representations that those specific components would be inspected in accordance with the technical specifications. *See* Gundersen Declaration, ¶¶ 27 and 28. The Staff's argument would render FPL's commitments meaningless. By allowing FPL to alter the AMP without first formally obtaining a license amendment, the Staff also runs afoul of 10 C.F.R. §§ 50.59(c)(2)(ii), which requires a license amendment for any change that would result in "more than a minimal increase in the likelihood of occurrence of a malfunction of structure, system, or component (SSC) important to safety previously evaluated in the final safety analysis report (as updated." The removal of a safety-related component from the AMP would, by its own terms, qualify as a malfunction.

The following timeline illustrates the fact that FPL's changes to the design of the Unit 2 steam generators, as documented in the DBD, were not submitted to the NRC or even acknowledged by the NRC in either of the publicly noticed license amendment proceedings claimed by FPL and the Staff to include those design changes:

| **Document Date** | **Document Description** | **Submitted to NRC or otherwise public?** |
|---|---|---|
| May 26, 2006 | FPL submits LAR for Amendment 147 regarding steam generator tube integrity (contains no reference to RSG design changes other than addition of 588 tubes). | Yes (ML061510346) |
| July 18, 2006 | NRC issues Federal Register Notice of LAR Amendment 147 (contains no mention of steam generators). | Yes. 71 Fed. Reg. 40,746 |

| | | |
|---|---|---|
| March 2007 (exact date not provided by FPL) | Document No. DBD-SLI-OLR-2, Revision 1 (revises design basis for AMP – handwritten changes show removal of stay cylinder, addition of 588 tubes, substitution of plate supports for lattice (*i.e.,* eggcrate) supports, installation of steam nozzle venturi. Modifications to tubesheet not discussed). | *No until April 28, 2014 when released by FPL (NRC Public Document Room has no record)* |
| May 29, 2007 | NRC issues License Amendment 147 and safety evaluation (contains no mention of DBD-SLI-OLR-2 or RSG design changes). | Yes (ML071490483, ML072140147) |
| December 2007 | NRC completes its inspection of RSG installation and issues Integrated Inspection Report on February 1, 2008. | Yes (ML080350408) |
| June 26, 2008 | FPL submits UFSAR Amendment 18 in connection with RSG installation. UFSAR no longer refers to a stay cylinder, shows the addition of 588 tubes, refers to tube support plates instead of eggcrate supports, and refers to steam nozzle venturis. But it does not contain a full description of RSG design changes. | *No until April 15, 2014 when released by the NRC PDR (ML14104B631)* |
| June 26, 2008 | FPL submits 50.59 Summary to NRC (no details of RSG design changes provided). | Yes (ML081840111) |
| April 2010 (exact date not provided by FPL) | Document No. DBD-SLI-OLR-2, Revision 2 (revises design basis for AMP in accordance with Revision 1) | *No until April 28, 2014 when released by FPL (NRC Public Document Room has no record)* |
| Feb. 25, 2011 | FPL applies for EPU for Unit 2 (without explicitly identifying RSG design changes). | Yes (ML110730299) |
| Sept. 24, 2012 | NRC approves EPU for Unit 2 and issues SER, taking account of design differences between Unit 1 and Unit 2 but not explaining their safety significance | Yes (ML12235A463) |

Thus, the table above shows that until this proceeding began, no publicly available documents described the RSG design changes made by FPL in 2007; nor were the RSGs identified in any NRC hearing notice. SACE only learned of the Unit 2 RSG design changes when they were

disclosed in the course of the San Onofre steam generator proceeding. *See* Gundersen Declaration, ¶ 29 and note 2.

Both FPL and the Staff also argue that SACE has failed to show that the ongoing actions taken by the Staff in its oversight of steam generator tube integrity inspections at St. Lucie Unit 2 amount to a proceeding for approval of FPL's RSG design changes. For instance, FPL argues that the Staff has not issued a *de facto* license amendment for the RSGs because it did not initiate a Confirmatory Action Letter ("CAL") or "other extraordinary process conditioning restart on certain actions or calling into question the continued safe operation of the reactor." FPL Answer at 9. As explained in *Perry,* however, the key factor in determining whether the Staff has issued a *de facto* license amendment is whether "whether the NRC has permitted the licensee to operate 'in any greater capacity' than originally prescribed" when "all relevant safety regulations and license terms remain applicable." *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant), CLI-96-13, 44 NRC 315, 327 (1996). Here, each time the NRC Staff approves or conducts an inspection of the Unit 2 RSGs, it is affirming that the most recently approved reactor design has been properly inspected and is safe. If there is a gap between the nature of the safety design as last approved in a duly noticed licensing proceeding and the nature of the design as it exists currently, then any approval by the Staff necessarily includes the implicit approval of the design change. Thus, in approving the adequacy of tube generator inspections the NRC Staff has "by indirection" done "what it is prohibited from doing directly," *i.e.,* amended FPL's operating license to accept safety assurances by FPL that are not based on the steam generator equipment that is described in the last duly approved description of the steam generator design (*i.e.,* the OFSAR). *Citizens Awareness Network,* 59 F.3d at 295. The Staff's repeated and continuing acceptance of the re-design of the RSGs is anything but rote, because in every steam generator

inspection since the RSGs were installed, the Staff has had to account for an unusually high level of steam generator tube denting. This is the very problem that FPL originally committed to prevent by avoiding the use of plate supports for the tubes. *See* Gundersen Declaration, ¶ 25. Accordingly, the NRC Staff's proceeding for the amendment of FPL's operating license began with the EPU proceeding and continues currently.

**2. FPL's argument that the re-designed RSGs are bounded by original calculations for the safety of the steam generators is entirely undocumented and in any event is not dispositive of Contention 1.**

FPL also argues that no license amendment was required for installation of the RSGs because "the new steam generators were bounded by the original calculations for the original steam generators." FPL Answer at 18-19, Cross Declaration, ¶ 6. But FPL provides not a shred of evidence to support its claim, and therefore it may not be relied on to reject SACE's Hearing Request.

In any event, even if FPL had supported its argument, the existence of a bounding calculation does not resolve the question of whether the RSG design changes required a license amendment. While a bounding analysis (if provided) may turn out to satisfy the first four criteria in 10 C.F.R. § 50.59(c)(2) relating to the frequency of an accident, frequency of failure of safety equipment, or accident consequences, it does not address the other four criteria, which call for amendment of a license if a proposed "change, test or experiment" would:

(v) Create a possibility for an accident of a different type than any previously evaluated in the final safety analysis report (as updated);
(vi) Create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the final safety analysis report (as updated);
(vii) Result in a design basis limit for a fission product barrier as described in the FSAR (as updated) being exceeded or altered; or
(viii) Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses."

In this case, SACE has demonstrated that FPL's modifications to the St. Lucie Unit 2 steam generators create the potential for accidents or equipment malfunctions that were not contemplated in the OFSAR. *See* Hearing Request at 14-15. Not only has SACE raised these concerns, but the OFSAR itself specifically stated that plate supports for steam generator tubes – now used in the RSGs – would increase the potential for tube denting. *See* Gundersen Declaration, ¶ 25. In addition, as a result of the design changes, the design basis limit for the reactor coolant boundary ("RCB") may be exceeded. *See* Gundersen Declaration, ¶ 59. In addition, as Mr. Gundersen points out, the design differences between the Unit 2 OSGs and RSGs should change the results of the safety analysis for the RSGs. Gundersen Declaration, ¶ 50.

Finally, the highly unusual degree of wear experienced by the St. Lucie Unit 2 steam generator tubes constitutes evidence that the re-design of the Unit 2 RSGs is causing St. Lucie to operate unsafely and outside its design limits. *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-13-07, 77 NRC 307, 335 (2013) (vacated, CLI-13-09, __ NRC __ (Dec. 5, 2013) ("The unprecedented extent of tube wear and failures that SCE experienced in the SONGS Unit 3 replacement steam generators reveal that these steam generators have serious design and operational issues . . . . placing them beyond the envelope of experience with U-be steam generators.") As discussed in Mr. Gundersen's Declaration, the amount of wear in the St. Lucie steam generators is "astonishing." *Id.,* ¶ 37. Moreover, "the increasing wear gaps between the tubes and the Anti-vibration Bars (AVBs) caused by growth in the denting of the tubes and by poor thermal hydraulic conditions will over time create the very same type of tube-to-tube wear failures that occurred in San Onofre Unit 3." *Id.,* ¶ 63. Thus, contrary to FPL's argument (FPL Answer at 9), the level of wear of the St. Lucie steam

generators is unprecedented and indicates conditions not anticipated in the FSAR. *San Onofre,* LBP-13-7, 77 NRC 340-41. Accordingly, even if FPL had documented its purported bounding analysis, such an analysis would not have excused FPL from obtaining a license amendment under 10 C.F.R. § 50.59(c)(2)(i)-(viii).

**B. Contention 2 is Admissible.**

FPL and the Staff have also failed to show that Contention 2 should be rejected. While FPL argues that the type of denting now being experienced by the Unit 2 is not related to the RSG design, that assertion is effectively contested by FPL's own licensing document, the OFSAR – which specifically identified tube support plates as a potential cause of tube denting, and therefore disavowed them. SACE is therefore entitled to a hearing on Contention 2.

FPL also fails to support its assertion that the RSG design changes "were appropriately considered by the NRC and are currently reflected in St. Lucie Unit 2's UFSAR." FPL Answer at 25 (citing Declaration of Mr. Rudy Gil in Support of FPL's Answer Opposing SACE's Request for Hearing (Apr. 28, 2014) ("Gil Declaration")). While Mr. Gil cites passages in the EPU Licensing Report for the proposition that three of the RSG design changes were "accounted for" in the EPU proceeding (*id.,* ¶¶ 12, 15, and 18), in fact these discussions were brief and incomplete, and did not include all of the design changes. In ¶ 12, for example, Mr. Gil asserts that "the additional 588 tubes" were taken into account in the EPU license amendment request ("LAR") at page 2.2.2-58. But the LAR simply states that the steam generators each have 8,999 tubes; it entirely fails to analyze the safety significance of adding 588 tubes to the original 8,411 tubes. Similarly, in ¶ 15, Mr. Gil asserts that the perforation of the tubesheet with 588 new holes was considered in the EPU LAR at page 2.2.2-67. In fact, however the EPU LAR simply cites an AREVA study that purportedly addresses the issue of stress associated with the tubesheet

"hole pattern."[11] This hardly amounts to a documented demonstration of a safety analysis for amending the St. Lucie Unit 2 operating license to allow perforation of the tubesheet. In ¶ 18, Mr. Gil claims that the EPU LAR discusses the "targeted design function" of steam generator support plates to "preclude denting." But nowhere does the EPU LAR acknowledge that substitution of plate supports for lattice (*i.e.,* eggcrate) supports constitutes a complete reversal of FPL's design commitment in the OSG; nor does the EPU LAR explain why FPL has disavowed its previous explicit commitment to eliminate the use of plates. And Mr. Gil does not provide any documentation of any previous NRC analysis of the safety implications of removing the stay cylinder. Thus, FPL and Mr. Gil fail to demonstrate that either FPL or the NRC made any systematic analysis of the safety implications of the RSG design changes, or how they would affect FPL's ability to comply with safety regulations applicable to steam generators.

Mr. Gil also generally states his disagreement with Mr. Gundersen's expert opinion regarding the safety significance of FPL's RSG design changes and whether they are responsible for the large number of tube failures; but these assertions do not resolve or eliminate SACE's concerns; they only serve to establish the existence of a material dispute of fact between SACE and FPL. Thus, they support rather than refute the admissibility of the contention. *See* 10 C.F.R. § 2.309(f)(1)(vi).

**2. RSG design changes are not clearly described in UFSAR**

FPL is also incorrect in stating that UFSAR Amendment 18 identifies all of the changes to the RSG design. UFSAR Amendment 18 identifies components that have been *added.* But it does not explain how the design of the steam generators changed. For that information, one must

[11] As stated in the license amendment request: "For the special case of the tubesheet, the AREVA program PLAQUE TUBULAIRE is utilized to determine stresses taking into account the stress concentration factors associated with the tubesheet hole pattern." *Id.* at 2.2.2-67.

compare the OFSAR with UFSAR Amendment 18. *See* SACE's Amended Hearing Request at 2-3. The DBD attached as Exhibit A to Mr. Cross' Declaration also provides some information about the RSG design changes. But it is not complete, nor is it a licensing document. FPL has never provided the NRC with any document that clearly identifies what changes it made to the design of the OSGs when it installed the RSGs.

### C. SACE Has Standing to Make this Hearing Request

Both FPL and the Staff argue that SACE lacks standing to make this hearing request because there is no "proceeding" in which it can intervene. FPL Answer at 6-9, NRC Staff Answer at 23. For the reasons discussed above in Section II.A, however, their argument is incorrect. The Staff also contends that SACE does not have standing because it is "not entitled to a proximity presumption." Staff Answer at 24. According to the Staff, SACE has failed to demonstrate that the amendment of FPL's operating license "quite obviously entails an increased potential for offsite consequences." *Id.* (citing *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-04, 49 NRC 185, 191 (1999)).[12] This argument is without merit. First, as discussed in *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Units 1 and 2), CLI-89-21, 30 NRC 325, 329 (1989) (cited in *Zion* at 191), in cases "related to the operation of the reactor itself" – such as this one -- the potential for increased offsite consequences is considered "obvious." In addition, Mr. Gundersen's Declaration provides a discussion of the potential accident consequences of the Staff's improper approval of the RSG design changes.

[12] The Staff also argues that SACE lacks standing because FPL and not the Staff caused the injuries of which SACE complains. Staff Answer at 24. Both the Staff and FPL have taken the position, however, that the Staff has amended FPL's operating license to permit operation of Unit 2 with the re-designed steam generators. *See* discussion above in Section II.A. Accordingly, the Staff's approval of the license amendment is a cause of SACE's injury.

*Id.,* ¶¶ 59-64. If there were any doubt about the accident risks posed by faulty steam generators, they are clarified by the following NRC Federal Register notice:

> The SG tubes in pressurized water reactors (PWRs) have a number of important safety functions. These tubes are an integral part of the reactor coolant pressure boundary (RCPB) and, as such, are relied upon to maintain primary system pressure and inventory. As part of the RCPB, the SG tubes are unique in that they are also relied upon as a heat transfer surface between the primary and secondary systems such that residual heat can be removed from the primary system and are relied upon to isolate the radioactive fission products in the primary coolant from the secondary system. *In addition, the SG tubes are relied upon to maintain their integrity to be consistent with the containment objectives of preventing uncontrolled fission product release under conditions resulting from core damage severe accidents.*

Notice of Opportunity To Comment on Model Safety Evaluation on Technical Specification Improvement To Modify Requirements Regarding the Addition of LCO 3.4.[17] on Steam Generator Tube Integrity Using the Consolidated Line Item Improvement Process, 70 Fed. Reg. 10,298 10,299 (March 2, 2005) (emphasis added). In contrast to this case, *Zion* concerned a shutdown reactor, and *St. Lucie* concerned the use of respirators by reactor works.

## III. CONCLUSION

For the foregoing reasons, FPL's and the NRC Staff's oppositions to SACE's hearing request are without merit. SACE respectfully submits that sufficient evidence has been submitted to make a merits ruling for SACE regarding Contention 1. If the Commission finds otherwise, Contention 1 should be admitted for further litigation. Contention 2 is also admissible and should be accepted for a hearing. In the meantime, the Commission should take all measures necessary to protect the integrity of the licensing and hearing processes.

Respectfully submitted,

*(Electronically signed by*)
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May 5, 2014

UNITED STATES OF AMERICA
BEFORE THE NUCLEAR REGULATORY COMMISSION

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| In the Matter of: | ) | |
| *Florida Power & Light Co.* | ) | Docket No. 50-389 |
| St. Lucie Plant, Unit 2 | ) | |
| | ) | |

**CERTIFICATE OF SERVICE**

I certify that on May 5, 2014, I served copies of the foregoing Southern Alliance for Clean Energy's Reply to Oppositions to SACE's Hearing Request Regarding *De Facto* Amendment of St. Lucie Unit 2 Operating License on the parties to this proceeding by posting it on the NRC's Electronic Information Exchange.

*(Electronically signed by)*
Diane Curran