



April 1, 2011

L-2011-117  
10 CFR 50.90

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Re: St. Lucie Plant Unit 1  
Docket No. 50-335  
Renewed Facility Operating License No. DPR-67

Response to NRC Instrumentation & Controls Branch Request for Additional Information Regarding Extended Power Uprate License Amendment Request

References:

- (1) R. L. Anderson (FPL) to U.S. Nuclear Regulatory Commission (L-2010-259), "License Amendment Request for Extended Power Uprate, November 22, 2010, Accession No. ML103560419.
- (2) Email from T. Orf (NRC) to C. Wasik (FPL), "St. Lucie Unit 1 EPU – request for additional information (I&C)," March 9, 2011, Accession No. ML110680373.

By letter L-2010-259 dated November 22, 2010 [Reference 1], Florida Power & Light Company (FPL) requested to amend Renewed Facility Operating License No. DPR-67 and revise the St. Lucie Unit 1 Technical Specifications (TS). The proposed amendment will increase the unit's licensed core thermal power level from 2700 megawatts thermal (MWt) to 3020 MWt and revise the Renewed Facility Operating License and TS to support operation at this increased core thermal power level. This represents an approximate increase of 11.85% and is therefore considered an extended power uprate (EPU).

By email from the NRC Project Manager dated March 9, 2011 [Reference 2], additional information related to the proposed steam generator low level trip setpoint was requested by the NRC staff in the Instrumentation & Controls Branch (EICB) to support their review of the EPU LAR. The request for additional information (RAI) identified five questions. The response to these RAIs is provided in Attachment 1 to this letter.

ADDI  
NRC

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the designated State of Florida official.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-259 [Reference 1].

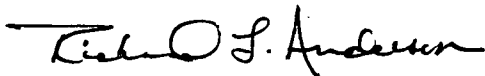
This submittal contains no new commitments and no revisions to existing commitments.

Should you have any questions regarding this submittal, please contact Mr. Christopher Wasik, St. Lucie Extended Power Uprate LAR Project Manager, at 772-429-7138.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on *01-April-2011*

Very truly yours,



Richard L. Anderson  
Site Vice President  
St. Lucie Plant

Attachment

cc: Mr. William Passetti, Florida Department of Health

## **Response to Request for Additional Information**

The following information is provided by Florida Power & Light in response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support Extended Power Uprate (EPU) License Amendment Request (LAR) for St. Lucie Nuclear Plant Unit 1 that was submitted to the NRC by FPL via letter (L-2010-259) dated November 22, 2010 (Accession Number ML103560419).

In an email dated March 9, 2011 from NRC (Tracy Orf) to FPL (Chris Wasik), (Accession Number ML 110680373), Subject: St. Lucie Unit 1 EPU – request for additional information (I&C), the NRC staff requested additional information regarding FPL's request to implement the EPU. The RAI consisted of five (5) questions from the NRC's Instrumentation and Controls Branch (EICB). These five RAI questions and the FPL responses are documented below.

### **EICB-4**

The notes for the setpoints (Notes 1 and 2) are not consistent with the notes contained in the guidance provided in the April 30, 2010 for TSTF-493 (ML093570168 and ML100710442). Note 1 in Attachment 3 (page 2-4) of the licensing amendment request (LAR), reference ML1003560419, states that "If the as-found channel setpoint is either outside its predefined as-found acceptance criteria band or is not conservative with respect to the Allowable Value, then the channel shall be declared inoperable and shall be evaluated to verify that it is functioning as required before returning the channel to service." Further, in Attachment 5, Appendix E (page E-4) of the LAR it is explained that for St. Lucie the operability limit (OL) is synonymous with the as found acceptance criteria band. However, from the values presented in Attachment 5, Appendix E, page E-4, it appears that the OL are not symmetrical around the field trip setpoint (FTSP) of 35.5%, i.e.  $OL^+$  is 36.68% and  $OL^-$  is 34.78%. Thus  $OL^+$  is 1.18% off from FTSP, whereas  $OL^-$  is off by only 0.72% from the FTSP. If OL is synonymous with as-found tolerance (AFT) then it should be  $2xST$  (setting tolerance) or 0.5% in accordance with Attachment 5, Appendix E, page E-4. Thus, the OL band is greater than the calculated AFT of 0.5%. Since the FTSP is more conservative as compared with the calculated trip setpoint, an as-found value greater than the calculated AFT indicates that the instrument may not be functioning within the design values even if it is acceptable from the point of view of operability.

Hence, the first note requires evaluation of the channel performance whenever the as-found value for the channel setpoint is found outside its AFT but conservative with respect to allowable value (AV). TSTF-493 further clarifies that AFT is to be applied about the limiting trip setpoint (LTSP) or about any other more conservative setpoint. Evaluation of the channel performance will verify that the channel will continue to perform in accordance with safety analysis assumptions and the channel performance assumption in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. When the as-found deviation is found to exceed the AFT, an evaluation shall be made in accordance with the plant corrective action procedures (CAP) to verify that the instrument is functioning as designed. The licensee is requested to clarify how Note 1 meets the guidance of RIS 2006-17 and TSTF-493 from the instrument design point of view when the as-found value is found to be greater than AFT. The licensee should further clarify what action/s will be taken when the as-found value is found to be greater than AFT. In addition, licensee is requested to justify the statement that OL and AFT are synonymous from the instrument design point of view as explained in RIS 2006-17.

## Response

Several questions are posed in EICB-4 and will be addressed in turn. The first question involves the symmetry of the OL band about the FTSP. The following excerpt is taken from page E-4 of Attachment 5, Appendix E, "the ST is normally centered about the nominal equipment setting. It is noted that for some trip functions the existing ST is non-symmetrical about the nominal trip setpoint and for these functions the OL band is structured to provide equal tolerance above and below the ST limits." As shown in the summary calculation of Appendix E, the ST band of -2.410 Vdc to -2.448 Vdc (equivalent to 35.25% to 36.20%) is non-symmetrical about the FTSP of -2.420 Vdc (equivalent to 35.5%). However, the OL band (-2.391 Vdc to -2.467 Vdc) provides 19 mvdc above and below the ST band limits and thus the OL band is symmetrical about the ST band. Setpoints that are found to be within the specified ST band are not typically optimized, since frequent minor adjustment of potentiometers within a small band can be counterproductive. The relationship between the OL and ST bands provides a consistent margin above and below the range of permissible as-left settings for determination of abnormal channel performance in both the positive and negative directions.

The second question involves the width of the OL band. As discussed on page E-4 of Attachment 5, Appendix E, the OL band is based on two times the ST band. As shown in the summary calculation of Appendix E, the width of the ST band is 38 mvdc and the width of the OL band is 76 mvdc. The setting tolerance in the non-conservative (low) direction is 10 mvdc or 0.25% span and the setting tolerance in the conservative (high) direction is 28 mvdc or 0.70% span. As described in section 4.6.6 of the Westinghouse setpoint calculation to be made available per the response to EICB-6, the RPS bistable ST uncertainty term used in the TLU determination is based on the 10 mvdc allowed in the non-conservative direction. For all existing RPS and ESF functions that utilize non-symmetrical as-left bands, the width of the as-found band (synonymous with OL band) is equal to two times the width of the as-left band (synonymous with ST band).

The third question involves clarification of how Note 1 meets the guidance of RIS 2006-17 and TSTF-493 from the instrument design point of view when the as-found value is found to be greater than AFT and also clarify what actions will be taken when the as-found value is found to be greater than the AFT. The updated St. Lucie setpoint methodology reflects the guidance of RIS-2006-17 and TSTF-493 pertaining to inclusion of a test acceptance criteria band for as-found instrument values (AFT or OL band) which facilitates identification and correction of excessive setpoint drift in either direction. In accordance with RIS and TSTF guidance, as-found and as-left acceptance criteria bands are defined in the surveillance test procedures and these bands are constructed around the field trip setpoint (rather than around the TS setpoint). If an as-found setpoint value exceeds the AFT limits (synonymous with OL limits), the channel will be declared inoperable and the cause of the abnormal channel performance will be evaluated and corrected under the corrective action program before the channel is returned to service. As discussed in the last paragraph on page E-4 of Attachment 5, Appendix E, the wording of the proposed TS Notes is taken from the cited NRC letter to the Nuclear Energy Institute (NEI), Accession Number ML5250004, and is considered to be more applicable to the existing 2-column format of the St. Lucie Unit 1 Technical Specifications. Specifically, the NEI wording includes the concept of compliance with the setpoint Allowable Value whereas the TSTF notes do not. The phrase "or is not conservative with respect to the Allowable Value" contained within the proposed wording of Note 1 will be met within the intent of the RIS and TSTF guidance since the proposed Allowable Value of  $\geq 34.78\%$  coincides with the minimum OL (synonymous with AFT) limit.

The final question involves justification for the statement that OL and AFT are synonymous from the instrument design point of view as explained in RIS 2006-17. As discussed on page E-4 of Attachment 5, Appendix E, St. Lucie has historically used an as-found tolerance band width equal to 2 times the procedure ST as the basis for initiation of corrective action under the CAP program.

Several other methodologies for calculation of OL band width based on statistical combination of drift and other periodic test uncertainty effects were considered, but rejected, since the resultant OL bands were either larger or smaller than reasonable. This result is due to differences in the relative magnitude of manufacturer' specifications for bistable uncertainty effects between the three (RPS, ESFAS & AFAS) protection systems (e.g., RPS bistable drift spec is 0.25%, but the AFAS bistable drift spec is 0.05%). While some plants have established separate AFT and OL bands based on 2-sigma and 3-sigma drift specifications, this approach was considered and found to be unsatisfactory for St. Lucie. Based on review of as-found surveillance data for each of the three protection systems, the magnitudes of the ST and AFT bands are tight enough to identify abnormal equipment operation without creating a high level of false detections. By virtue of treating the AFT and OL bands as synonymous, action is taken under the corrective action program and the channel is declared inoperable whenever a setpoint is found outside the AFT band (without waiting for some third less-restrictive band to be exceeded).

#### **EICB-5**

Similarly St. Lucie note 2 states that "The instrument channel setpoint shall be reset to a value that is within the as-left tolerance of the Trip Setpoint, or a value that is more conservative than the Trip Setpoint, otherwise that channel shall not be returned to Operable status. The Trip Setpoint and the methodology used to determine the Trip Setpoint, the as-found acceptance criteria band, and the as-left acceptance criteria are specified in the UFSAR." This note is also not consistent with the guidance contained in TSTF-493. The standard note in TSTF-493 further states that "Setpoints more conservative than the LTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the surveillance procedures (Nominal Trip Setpoint)." The nominal trip setpoint (NTSP) is the same as the FTSP in case of St. Lucie Unit 1. If the instrument cannot be reset to a value which is within the as-left tolerance (ALT) of the FTSP then it must be evaluated for proper operation and the evaluation recorded in the plant CAP. The licensee is requested to explain how Note 2 meets the guidance of RIS 2006-17 and TSTF-493 and what evaluation/s will be performed when the as-left value is found to exceed the ALT. In addition, please provide a description of the criteria that triggers an entry into the corrective action program and the criteria for declaring the instrument as inoperable.

#### **Response**

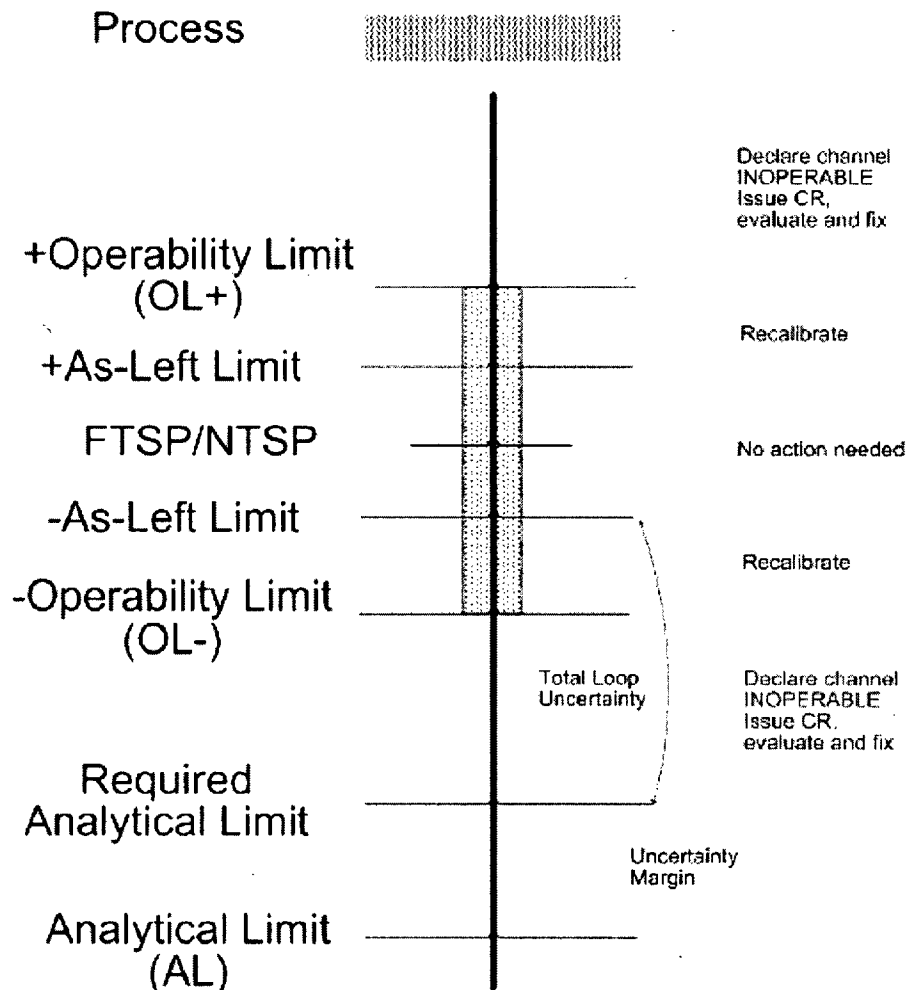
As discussed in the response to EICB-4, the wording of the proposed TS Notes is taken from the cited NRC letter to the Nuclear Energy Institute (NEI) and is considered to be more applicable to the existing 2-column format of the St. Lucie Technical Specifications. Specifically, the NEI wording includes the concept of compliance with the setpoint Allowable Value whereas the TSTF notes do not. TSTF-493 Note 2 includes an allowance for compliance based on surveillance procedure setpoints rather than TS setpoints provided that the as-found and as-left tolerance bands apply to the procedure setpoint. The St. Lucie as-found and as-left tolerance bands are consistent with TSTF-493 Note 2 in that they are constructed around the procedure setpoint, rather than around the TS setpoint. Although the wording of TSTF-493 Note 2 is more explicit than NEI Note 2 regarding compliance with as-left criteria when applied to surveillance procedure setpoints, the St. Lucie setpoint methodology and associated procedural requirements treat the wording of the 2 Notes as equivalent and is fully compliant with both. If an as-found setpoint value exceeds the AFT limits (synonymous with OL limits), the channel will be declared inoperable and the cause of the abnormal channel performance will be evaluated and corrected under the corrective action program before the channel is returned to service.

**EICB-6**

The summary of the calculation provided does not contain all the information needed by Staff to complete the review. The licensee is requested to provide the Staff with a copy of the calculation since this is the only calculation that involves setpoint change. The calculation should clearly state the as-found tolerance, as-left tolerance, the allowable value and the NTSP or the FTSP.

**Response**

The requested Steam Generator Level setpoint calculation is identified as CN-TAS-08-36, Revision 1, "Setpoint Uncertainties and Operability Limits for the Steam Generator Level RPS and AFAS Functions for St. Lucie Unit 1". This calculation is a Westinghouse proprietary document and will be made available for NRC review. As documented in the Technical Specification markups of Attachment 3 of the EPU License Amendment Request (NRC Accession Number ML103560427), the proposed RPS Low Steam Generator Level TS trip setpoint is  $\geq 35.0\%$  and the Allowable Value is  $34.78\%$ , which is equal to the low side of the Operability Limit band. OL limits (synonymous with AFT), as-left tolerance and FTSP are defined in the setpoint calculation and illustrated in the following figure that has been extracted from the setpoint calculation.



**EICB-7**

**Combining errors under the square root of sum of squares (SRSS) is based on the assumptions that all such errors are random in nature. The information docketed with the licensing amendments request does not justify the rationale for combining the errors under the SRSS. Please describe the nature of the errors and justify using the SRSS for combining these errors.**

**Response**

As documented in the Westinghouse setpoint calculation to be made available per the response to EICB-6, various bias terms (including reference leg density effect) are considered, and when applicable, these bias terms are algebraically added in the determination of total loop uncertainty. The following random uncertainty terms are applicable to the Steam Generator level transmitters: accuracy, M&TE, setting tolerance, drift, temperature effect, static pressure effect and radiation effect (TLU for harsh conditions only). The following random uncertainty terms are applicable to the Steam Generator level bistables: accuracy, M&TE, setting tolerance, drift and temperature effect. All of these random device uncertainty effects, with the exception of M&TE and setting tolerance, are based on manufacturers' specifications. Manufacturers' uncertainty specifications are treated as random, independent and normally distributed unless otherwise described in the manufacturers' qualification documentation. By convention, manufacturers' uncertainty terms reflect an instruments response to independent external driving functions (e.g. time, temperature, radiation and static pressure) or reflect the operating principle and physical construction of the device (e.g. accuracy). Since there is no common root cause of these uncertainty effects, they are considered to be independent.

M&TE and setting tolerance terms are based on the requirements of the calibration procedures. The M&TE and setting tolerance terms are considered to be independent for the transmitter and bistable since these instruments are calibrated separately (i.e. split loop calibration). Use of different procedures, performed at different times and by different I&C technicians, supports the independence of these uncertainty effects.

**EICB-8**

**In the second paragraph of item II on page E-3 of Attachment 5, Appendix E there is an equation that notes that (TLU + ST SAPP UA). This equation is missing the sign after TLU + ST. Please clarify the equation.**

**Response**

FPL agrees that the inequality sign is missing in the second paragraph of item II on page E-3 of Attachment 5, Appendix E. As correctly depicted in the associated paragraph text, the missing inequality sign is less than or equal to. The equation in parentheses should read as follows:  
TLU + ST ≤ SAPP UA.