From: Ken_Frehafer@fpl.com
Sent: Wednesday, August 06, 2008 3:40 PM
To: Brenda Mozafari
Subject: St. Lucie Preliminary Response for RWT Level Change Proposed License Amendment LIC-109 Supplemental Information Request
Attachments: RWT instrumentation calcs.pdf

Brenda,

This email provides FPL's preliminary supplemental information the NRC Staff requested as part of the LIC-109 acceptance review for St. Lucie's RWT level change TS amendment. As discussed and agreed upon during the July 30, 2008 FPL/NRC telecon, this information is preliminary in nature, and a fully vetted response (e.g., prepared, verified, and approved per FPL QA procedures) will be docketed the week of August 11, 2008.

The license amendment requests (LARs) propose to amend Facility Operating Licenses DPR-67 for St. Lucie Unit 1 and NPF-16 for St. Lucie Unit 2 to Increase the Refueling Water Tank (RWT) level. To support the Nuclear Regulatory Commission (NRC) assessment of the acceptability of the LARs in regard to the proposed changes, please provide the responses to the following items:

NRC Question 1:

Calculation methodology: Provide documentation (including sample calculations) of the methodology used for establishing the limiting RWT minimum water level and corresponding volume acceptable values for the As-Found and As-Left settings as measured in periodic surveillance testing. Indicate the related Analytical Limits and other limiting design values (and the sources of these values) for the RWT minimum water level and corresponding volume.

FPL Response to Question 1:

There are two separate RWT level monitoring instrumentation systems. The Recirculation Actuation System (RAS) level instrumentation is used to determine RWT level, provides local indication in the control room, and is used to verify that the Technical Specification requirements for RWT minimum contained volume of borated water, are being met. In addition to the RAS instrumentation, RWT HIGH/LOW level alarms are also available to the control room Operators. These alarms provide no safety related functions and are not relied upon by the control room Operators for RWT TS level compliance.

The calculations used for establishing the limiting RWT minimum water level while containing conservatisms, are solely mechanical engineering calculations. The level calculations are not instrumentation and control calculations, and do not address the uncertainty associated with the RWT level instrumentation.

The Recirculation Actuation System (RAS) level instrumentation is used to determine RWT level. The uncertainty associated with the RAS RWT level channel indication is determined in calculations PSL-1FJI-08-002 (Unit 1) and PSL-2FJI-08-001 (Unit 2). These calculations are provided in Attachments 2 and 3, respectively. These calculations are performed in accordance with Florida Power and Light (FPL) Instrumentation and Control Standard IC-3.17, “Instrument Setpoint Methodology for Nuclear Power Plants”.

Regulatory Guide (RG) 1.105, Setpoints for Safety-Related Instrumentation, describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the technical specification limits, and endorses ANSI/ISA Standard ISA-67.04-1994, Part 1. St. Lucie Units 1 and 2 are not specifically committed to RG 1.105. However, Standard IC-3.17 has been written to conform to ISA-67.04-1994, Part 1, and is also consistent with the recommended practice of ISA-67.04-1994, Part 2.

The methodology used for the development and application of RWT level instrument uncertainties is based on the Square Root-Sum of the Squares (SRSS) methodology. The methodology accounts for random, independent (x, y), random, dependent (w + u) and non-random/bias (v, t) elements differently in determining the Total Loop Uncertainty as follows:

$$TLU = \pm[x2 + y2 + (w + u)1/2]1/2 + v – t.$$

The resulting total loop uncertainties form the basis for the ± tolerances established in the plant surveillance procedures for Engineered Safeguards System Loop Instrumentation Calibration for Refueling Water Storage Tank Level. Surveillances are performed to meet the requirements of TS ESFAS Table 4.3-2. The ± tolerances in these procedures provide guidance for acceptable “As Found” and “As Left” settings for the associated instrumentation channel.

As Found data found outside of the acceptable tolerances are flagged as unacceptable and subsequently adjusted back into tolerance. As Left data is recorded to document any adjustments to the instrument loop relative to its As Found condition.

In addition to the RAS RWT instrumentation described above, RWT HIGH/LOW level alarms are also available to the control room Operators. These alarms provide no safety related functions and are not relied upon by the control room Operators for RWT TS level compliance. The alarms, however give the control room Operators an early warning indication of RWT level trending high or low. Once the RWT level alarm is actuated the alarm response procedures (1-ARP-01-R23 & 2-ARP-01-S29) instruct the Operators to confirm levels by using the RAS RWT level indicators and to take the appropriate action if needed. The RWT low level alarm is set conservatively above the RWT minimum required level

accounting for the uncertainty associated with the instrument alarm setpoint.

The Instrument Uncertainty calculations performed for the RWT HIGH/LOW alarm instrumentation (LIS-07-3 & LIS-07-1), also utilize FPL Standard IC-3.17.

NRC Question 2:

Measures to Ensure Operability: Describe the measures to be taken to ensure that the associated instrument channel is capable of performing its specified safety functions in accordance with applicable design requirements and associated analyses. Include in your discussion information on the controls you employ to ensure the as-left setting after completion of periodic surveillance is consistent with your methodology. Also, discuss the plant corrective action processes (including plant procedures) for restoring channels to operable status when channels are determined to be "inoperable" or "operable but degraded." If the controls are located in a document other than TS (e.g. plant test procedure), describe how it is ensured that the controls will be implemented.

FPL Response to Question 2:

The St. Lucie Unit 1 and Unit 2 Technical Specifications (TS) specify the operability requirements for the RAS RWT level instrumentation. The TSs also specify the Surveillance Requirements (SRs) that are to be performed to demonstrate that the instrumentation is operable. Performing the specified SRs ensure that the associated instrument channels are capable of performing their specified safety functions in accordance with applicable design requirements and associated analyses. TS SR 4.3.2.1.1 for Unit 1 and TS SR 4.3.2.1 for Unit 2, Functional Unit 5, Containment Sump Recirculation, requires the performance of a shiftly (12 hours) channel check, a monthly (31 days) channel functional test, and a channel calibration every refueling (18 months). The level indications used to verify RWT level are associated with the RAS channels. The instrumentation TSs do not specify a setpoint or allowable values for the RAS RWT level associated with the required minimum contained volume of borated water in the RWT, because there is no required automatic action (trip or equipment actuation) or alarm function for the RAS instrumentation associated with this plant condition.

NAP- 403 "Conduct of Maintenance" and QI-12-PR/PSL-7 "Calibration of Installed Plant Instrumentation and Control Equipment St. Lucie Plant" provide direction to maintenance personnel in the performance of maintenance activities. Calibration sheets, where appropriate, are completed with "As-Found" and "As-Left" calibration data, as well as measurement and test equipment (M&TE) usage.

A supervisor is required to review all surveillance data and determine if the data comply with the acceptance criteria. All TS and equipment operability concerns are promptly communicated to Operations. Nonconformances are documented in the CR system

Performance of the SRs and the associated implementing procedures ensure that the RWT level instrumentation is capable of performing its required functions.

Per plant procedures, any TS equipment found to be inoperable shall be declared out-of-service and entered into the Equipment Out-of-Service log. The equipment shall not be declared back in service until appropriate testing has been performed and documented, assuring the operability of the RWT level instrumentation.

Should the number of Operable channels required by TSs be less than that required, LCO 3.3.2.1 action statement 13 would apply. Entry into TS action statements is tracked via the plant's Action Tracking database. Equipment return to service is controlled in accordance with the plant's Conduct of Operations. The Shift Manager shall authorize the return of Technical Specification, safety related, and risk significant equipment or systems to operable status provided, among others, that the component or system is capable of performing its design function, and required surveillance testing is satisfactorily completed.

RWT level instrumentation for the HIGH/LOW alarms are calibrated on an 18 month interval as part of the preventive maintenance program. The LOW alarm setpoint will be set at 33 feet which corresponds to the TS limit, and accounts for instrument uncertainty.

TS SR 4.1.2.8.a.2 and TS SR 4.5.4.a.1 specifies that the RWT shall be demonstrated OPERABLE at least once per 7 days by verifying the water level in the tank (Unit 1)/verifying the contained borated water volume in the tank (Unit 2) In compliance with these TSs, plant Operators perform RWT level checks, utilizing instruments LIS-07-2A thru 2D, on a weekly basis in accordance with Operations Surveillance Procedure 1/2-OSP-100.01. The RWT level readings will be compared to a value of 33 feet, which corresponds to the TS limit, and accounts for instrument uncertainty. The control room RWT level indicating functions of RAS are safety related and facilitate monitoring of RWT level to verify compliance with TS requirements for the RWT.

Calcs are provided below:
(See attached file: RWT instrumentation calcs.pdf)

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