FPL

February 28, 2013

L-2013-079
10 CFR 2.202

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389

Florida Power & Light/St. Lucie's Overall Integrated Plan in Response to March 12, 2012 Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

References:

1. NRC Order Number EA-12-051, Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, dated March 12, 2012, Accession No. ML12056A044.
2. NRC Interim Staff Guidance JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, dated August 29, 2012, Accession No. ML12221A339.
3. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1, dated August 24, 2012, Accession No. ML122400399.
4. FPL Letter L-2012-384, dated October 25, 2012, Florida Power & Light (FPL)'s Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), Accession No. ML12300A420.

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to FPL. Reference 1 was immediately effective and directs FPL to implement and maintain reliable spent fuel pool water level instrumentation. Specific requirements are outlined in Attachment 2 of Reference 1.Reference 1 requires submission of an Overall Integrated Plan by February 28, 2013. The NRC Interim Staff Guidance (ISG) (Reference 2) was issued August 29, 2012 which endorses industry guidance document NEI 12-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 3 provides direction regarding the content of this Overall Integrated Plan.

Reference 4 provided the FPL/St. Lucie initial status report regarding reliable spent fuel pool instrumentation, as required by Reference 1.

The purpose of this letter is to provide the Overall Integrated Plan pursuant to Section IV, Condition C.1, of Reference 1. This letter confirms FPL/St. Lucie has received Reference 2 and has an Overall Integrated Plan developed in accordance with the guidance for installing and maintaining reliable spent fuel pool water level indication that satisfies the requirements of Reference 1.

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The information in the enclosure provides the FPL/St. Lucie Overall Integrated Plan for reliable spent fuel pool instrumentation pursuant to Reference 3. The enclosed Integrated Plan is based on conceptual design information that is current as of this letter. As design details and associated procedural guidance are finalized, additional information, as well as revisions to the information contained in the enclosure to this letter, will be communicated to the NRC in the 6-month Integrated Plan updates as required by Reference 1.

This letter contains no new regulatory commitments.

If there are any questions regarding this submittal, please contact Eric Katzman, St. Lucie Licensing Manager, at (772) 467-7734.

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

Executed on February 28, 2013.

Respectfully submitted,

Joseph Jensen
Site Vice President
St. Lucie Plant

Attachment
St. Lucie (PSL) Integrated Plan with Regard to Reliable Spent Fuel Pool Instrumentation

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator
NRC Resident Inspector

St. Lucie (PSL) Integrated Plan with Regard to Reliable Spent Fuel Pool Instrumentation

I. Introduction

The Nuclear Regulatory Commission (NRC) issued Order EA-12-051, *Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation*, (Reference 1) on March 12, 2012. The Order requires licenses to have a reliable indication of the water level in associated spent fuel storage pools capable of supporting identification of the following pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. The Order also requires that an overall integrated plan that provides a description of how the requirements of the Order will be achieved.

NEI 12-02, *Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,"* (Reference 4) provides an approach for complying with order EA-12-051. NRC Interim Staff Guidance JLD-ISG-2012-03, *Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation*, (Reference 3) considers that the methodologies and guidance in conformance with the guidelines provided in NEI 12-02, Revision 1, subject to the clarifications and exceptions specific to Section 3.4, Qualification, are an acceptable means of meeting the requirements of Order EA-12-051.

This integrated plan provides the St. Lucie Nuclear Power Plant (PSL) approach for complying with Order EA-12-051 using the methods described in NEI 12-02 Revision 1 & NRC JLD-ISG-2012-03. The current revision of the PSL Integrated Plan is based on our conceptual design information and will be revised as we proceed with detailed design engineering. Consistent with the requirements of Order EA-12-051 and the guidance in NEI 12-02, our six-month reports will delineate progress made, any proposed changes in our compliance methods, updates to the schedule, and if needed, requests for relief and the bases.

II. Schedule

NextEra will be implementing a standard Spent Fuel Pool (SFP) level indicating system design across our fleet. The installation time table will ensure that implementation is completed prior to the requirements of the order.

The following milestone schedule is provided. The dates are planning dates subject to change as design and implementation details are developed. Any changes to the following target dates will be reflected in the six month updates:

The current milestones are:	Unit 1	Unit 2
▪ Commence Engineering and Design	In progress	In progress
▪ Complete Design	3Q 2015	1Q 2015
▪ Complete Procurement of SFP Instruments	4Q 2014	2Q 2015
▪ Complete Installation of SFP Instruments	1Q 2015	3Q 2015
▪ Instruments Operational and Training completed	2Q 2015 (RF26)	4Q 2015 (RF22)

III. Identification of Spent Fuel Pool Water Levels

Key spent fuel pool water levels:

1. **Level adequate to support operation of the normal fuel pool cooling system** – Elevation 56'-0" for both Units 1 and 2. This elevation is derived from Unit 1 UFSAR Section 9.1 and is shown on isometric drawings 8770-G-125 Sheet FS-W-3 and 2998-G-125 Sheet FS-W-6 (References 10, 11 & 12 respectively).

2. **Level adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck** – An elevation approximately 10' above the highest fuel rack is utilized, with specific elevations as follows:

   Unit 1: El. 46"-3" based on Unit 1 FSAR Fig. 1.2-19 (Reference 17) in conjunction with plant drawings 8770-11884, 8770-11885 & 8770-11890 (References 13 thru 15 respectively).

   Unit 2: El. 46"-5" based on Unit 2 FSAR Fig. 1.2-17 (Reference 18) and plant drawing 2998-18511 (Reference 16).

   These elevations are approximately 10' above the top of the fuel racks (see Level 3 elevations below). This monitoring level ensures there is adequate water level to

provide substantial radiation shielding for personnel to respond to Beyond-Design-Basis External Events and to initiate SFP makeup strategies.

3. **Level where fuel remains covered** –

   Unit 1: El. 36"-3", based on Unit 1 FSAR Fig. 1.2-19 (Reference 17) in conjunction with plant drawings 8770-11884, 8770-11885 & 8770-11890 (References 13 thru 15 respectively).

   Unit 2: El. 36"-5", based on Unit 2 FSAR Fig. 1.2-17 (Reference 18) and plant drawing 2998-18511 (Reference 16).

   This is the nominal upper level of the fuel racks in each respective pool.

IV. Instruments

Design of the instruments will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02 as discussed below.

Primary and backup instrument channels will consist of fixed components. Design of the instruments will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02 as discussed below. The plan is for both channels to utilize Guided Wave Radar, which functions according to the principle of Time Domain Reflectometry (TDR). A generated pulse of electromagnetic energy travels down the probe. Upon reaching the liquid surface the pulse is reflected and based upon reflection times, level is inferred. Channel separation (independence) will be provided as part of the design of the SFP level instrumentation.

Nominal measured range will be continuous from the normal pool level elevation (60'-0" for both units) to the top of the spent fuel racks at elevation El. 36"-3" for Unit 1 and El. 36"- 5" for Unit 2 (see Level 3 references above).

Primary and Backup instrument channel level sensing components will be located on the South end of each respective SFP located as close to the opposite corners as practical to maintain maximum attainable separation (both units).

Reliability:
Reliability of the primary and backup instrument channels will be assured by conformance with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02, as discussed in Section VII, Qualification. Reliable level indication will be functional at all times of operation consistent with Section XV, Testing and Calibration.

Instrument Channel Design Criteria:
Instrument channel design criteria will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

V. Arrangement

The two SFP level instrument channels will be installed in diverse locations, arranged in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the SFP.

As indicated above, the primary and backup SFP level sensors will be installed in the South side of each unit's SFP, as close to the opposite corners as practical to maintain maximum attainable separation. Sensor conditioning electronics and battery backup will be mounted in a remote location separated from the SFP by a reinforced concrete wall(s) which will provide suitable radiation shielding for the electronics.

New SFP Level Instrumentation will be manufactured in accordance with IEEE 344 - 'Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations' (Reference 9). Cabling for power supplies and indications for each channel will be routed in separate conduits from the cabling for adjacent channel. New components and associated raceway will be installed per PSL specifications and procedures.

VI. Mounting

Mounting will be Seismic Class I. Installed equipment will be seismically qualified to withstand the maximum seismic ground motion considered in the design of the plant area in which it is installed.

VII. Qualification

Both channels will be reliable at temperature, humidity, and radiation levels consistent with the spent fuel pool water at saturation conditions for an extended period. Post event temperature at sensors located above the SFP is assumed to be 212°F. Post event humidity in the SFP Building is assumed to be 100% with condensing steam. Equipment will be qualified for expected conditions at the installed location assuming that normal power is unavailable and that the SFP has been at saturation for an extended period. Equipment located in the vicinity of the SFP will be qualified to withstand peak and total integrated dose radiation levels for its

installed location assuming that post event SFP water level is equal to the upper level of fuel racks for an extended period of time.

Instrument channel reliability will be demonstrated via an appropriate combination of design, analyses, operating experience, and/or testing of channel components for the following sets of parameters:

- conditions in the area of instrument channel component use for all instrument components,
- effects of shock and vibration on all instrument channel components, and
- seismic effects on instrument channel components used during and following a potential seismic event for all installed components.

Augmented quality requirements, similar to those applied to fire protection, will be applied to this project.

Temperature, humidity and radiation levels consistent with conditions in the vicinity of the SPF and the area of use considering normal operational, event and post-event conditions for no fewer than seven days post-event or until off-site resources can be deployed by the mitigating strategies resulting from Order EA-12-049 (Reference 2) will be addressed in the engineering and design phase. Examples of post-event (beyond-design-basis) conditions that will be considered are:

- radiological conditions for a normal refueling quantity of freshly discharged (100 hours) fuel with the SFP water level 3 as described in this order,
- temperatures of 212 degrees F and 100% relative humidity environment,
- boiling water and/or steam environment,
- a concentrated borated water environment, and
- the impact of FLEX mitigating strategies.

Components of the instrument channels will be qualified for shock and vibration using one or more of the following methods:

- Components are supplied by manufacturers using commercial quality programs (such as ISO9001, *Quality management systems – Requirements* (Reference 8)) with shock and vibration requirements included in the purchase specification at levels commensurate with portable hand-held device or transportation applications;
- Components have a substantial history of operational reliability in environments with significant shock and vibration loading, such as portable hand-held device or transportation applications; or
- Components are inherently resistant to shock and vibration loadings, such as cables.

The effects of postulated seismic events on installed instrument channel components (with the exception of battery chargers and replaceable batteries), will be verified to ensure that the equipment design and installation is robust. Applicable components of the instrument channels will be qualified by the manufacturer (or otherwise tested) for seismic effects at response levels commensurate with the equipment mounting location. Instrument channel qualification will be based on the guidance provided in Sections 7, 8, 9, and 10 of IEEE Standard 344-2004, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*, (Reference 9) or a substantially similar industrial standard. In addition, any of the below may also be used to provide additional assurance that the equipment will perform as designed during and following a seismic event:

- Review of operating history for components used in environments with significant vibration, such as for portable hand-held devices or devises used in transportation applications. The effects of low frequency, high acceleration will be included in the qualification as described above. Vibration qualification review will be inclusive of methods that demonstrate the effects of seismic motion imparted to the components at the location of the installation as discussed above;
- Demonstration that devices are substantially similar in design to equipment that has been previously tested for seismic effects in accordance with the plant design basis at the location where the instrument is to be installed (g-levels and frequency ranges).

In addition, pool mounted equipment is qualified for submergence, providing protection from wave and seiche related disturbances during and after a seismic event.

VIII. Independence

The primary instrument channel will be redundant to and independent of the backup instrument channel. Independence will be obtained through separation of the sensors, indication, backup battery power supplies, associated cabling and channel power feeds.

IX. Power Supplies

Both channels will be powered from dedicated batteries and local battery chargers. The battery chargers for both channels will normally be powered from separate sources of 120V AC power. Minimum battery life of 72 hours will be provided. The battery systems will include provision for battery replacement should the battery charger be unavailable following the event. Spare batteries will be readily available. In the event of a loss of normal power the battery chargers could be connected to another suitable power source.

X. Accuracy

Instrument channels will be designed such that they will maintain their design accuracy following a power interruption or change in power source without recalibration.

Accuracy will consider SFP conditions, e.g., saturated water, steam environment, or concentrated borated water. Additionally, instrument accuracy will be sufficient to allow trained personnel to determine when the actual level exceeds the specified lower level of each indicating range (levels 1, 2 and 3) without conflicting or ambiguous indication. The accuracy will be within the resolution requirements of Figure 1 of NEI 12-02.

XI. Testing

Instrument channel design will provide for routine testing and calibration consistent with Order EA-12-051 and the guidance in NEI 12-02. Details will be determined during the engineering and design phase. Instrument channel testing and calibration will be performed using existing plant work control processes.

XII. Display

The design will include remote indication that will be accessible during post event conditions. The location will ensure that it meets the following criteria:

- promptly accessible to the appropriate plant staff giving appropriate consideration to various drain down scenarios,
- outside of the area surrounding the SFP floor, e.g., an appropriate distance from the radiological sources resulting from an event impacting the SFP,
- inside a structure providing protection against adverse weather, and
- outside of any very high radiation areas or LOCKED HIGH RAD AREA during normal operation.

XIII. Training

The Systematic Approach to Training (SAT) will be used to identify the population to be trained and to determine both the initial and continuing elements of the required training. Training will be completed prior to placing the instrumentation in service.

XIV. Procedures

Procedures will be developed using guidelines and vendor instructions to address the maintenance, operation, and abnormal response issues associated with the new SFP instrumentation.

Procedures will address a strategy to ensure SFP water level addition is initiated at an appropriate time consistent with implementation of NEI 12-06, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide* (Reference 5).

Procedures will also address the following situations:

- If, at the time of an event or thereafter until the unit is returned to normal service, an instrument channel ceases to function, its function will be recovered within a period of time consistent with the emergency conditions that may apply at the time.
- If, at the time of an event or thereafter until the unit is returned to normal service, an instrument channel component must be replaced, we may use commercially available components that may or may not meet all of the qualifications (Section VII) to maintain the instrument channel functionality.

XV. Testing and Calibration

Processes will be established and maintained for scheduling and implementing necessary testing and calibration of the primary and backup spent fuel pool level instrument channels to maintain the instrument channels at the design accuracy. Testing and calibration of the instrumentation will be consistent with vendor recommendations and any other documented basis. Calibration will be specific to the mounted instrument and the monitor.

XVI. Need for Relief and Basis

We are not requesting relief from the requirements of Order EA-12-051 or the guidance in NRC JLD-ISG-2012-03 at this time.

Consistent with the requirements of Order EA-12-051 and the guidance in NEI 12-02, our six-month reports will delineate progress made, any proposed changes in our compliance methods, updates to the schedule, and if needed, requests for relief and their bases.

XVII. References

1) EA-12-051, Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation, March 12, 2012

2) EA-12-049, Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, March 12, 2012

3) NRC JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, Revision 0, August 29, 2012

4) NEI 12-02, Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," Revision 1, August 2012

5) NEI 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, Revision 0, August 2012

6) Letter L-2012-384 from Joseph Jensen, St. Lucie Plant Site Vice President to Document Control Desk (NRC), dated October, 2012, Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

7) Letter L-2012-385 from Joseph Jensen, St. Lucie Plant Site Vice President to Document Control Desk (NRC), dated October, 2012, Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

8) ISO9001, Quality management systems – Requirements

9) IEEE Standard 344-2004, IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations

10) U1/U2 UFSAR, Section 9.1 – Fuel Storage and Handling

11) Unit 1 Isometric Drawing 8770-G-125 Sheet FS-W-3

12) Unit 2 Isometric Drawing 2998-G-125 Sheet FS-W-6

13) 8770-11884 Rev. 2, "Spent Fuel Storage Racks – Details Region 2"

14) 8770-11885 Rev. 3, "Spent Fuel Storage Racks – Details Region 1"

15) 8770-11890 Rev. 2, "Spent Fuel Storage Racks – Pool Layout"

16) 2998-18511 Rev. 0, "Max Cap Spent Fuel Storage Module Assembly"

17) Unit 1 FSAR Fig. 1.2-19 (Drawing 8770-G-074 Rev 13, "General Arrangement Fuel Handing Building – Sections")

18) Unit 2 FSAR Fig. 1.2-17 (Drawing 2998-G-074 Rev 13, "General Arrangement Fuel Handing Building – Sections"