FPL

L-2013-038
10 CFR 52.3

February 5, 2013

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

Re: Florida Power & Light Company
Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
Updated Response to NRC Request for Additional Information Letter No. 042 (eRAI 5997)
RAI 13.03-17 (a & b) Standard Review Plan Section 13.03 – Emergency Planning

Reference:

1. NRC Letter to FPL dated October 26, 2011, Request for Additional Information Letter No. 042 Related to SRP Section 13.03 – Emergency Planning for the Turkey Point Nuclear Plant, Units 6 and 7 Combined License Application
2. FPL Letter L-2012-110 to NRC dated March 19, 2012, Supplement 2 Response NRC Request for Additional Information Letter No. 042 (eRAI 5997) Standard Review Plan Section 13.03 – Emergency Planning
3. FPL Letter L-2012-434 to NRC dated December 4, 2012, Revised Response to NRC Request for Additional Information Letter No. 051 (eRAI 6290) SRP Section 14.03 – Inspections, Tests, Analyses, and Acceptance Criteria
4. NRC Letter to FPL dated February 1, 2012, Request for Additional Information Letter NO.051 Related to SRP Section 14.03 - Inspections, Tests, and Acceptance Criteria for the Turkey Point Nuclear Plant Units 6 and 7 Combined License Application

Florida Power & Light Company (FPL) provides, as an attachment to this letter, its updated response to the Nuclear Regulatory Commission's (NRC) request for additional information (RAI) 13.03-17 provided in NRC Letter dated October 26, 2011, (Reference 1). The initial response to RAI 13.03-17 (a & b) were provided by FPL Letter dated March 19, 2012 (Reference 2). FPL Letter dated December 4, 2012 (Reference 3) revised the response to NRC RAI 14.03-2 provided in NRC Letter dated February 1, 2012 (Reference 4) to withdraw the exemption request for the technical support center relocation. The response to RAI 14.03-2 was revised based on discussions between the NRC staff and FPL. This letter provides a conforming change to the response to NRC RAI 13.03-17 (a & b). The areas of the response that have changed are indicated by revision bars in the right hand margin.

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NRO

If you have any questions, or need additional information, please contact me at 561-691-7490.

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

Executed on February 5, 2013.

Sincerely,

William Maher
Senior Licensing Director – New Nuclear Projects

WDM/GRM

Attachment: Revised FPL Response to NRC RAI No. 13.03-17 (eRAI 5997)

cc:
PTN 6 & 7 Project Manager, AP1000 Projects Branch 1, USNRC DNRL/NRO
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant 3 & 4

NRC RAI Letter No. PTN-RAI-LTR-042

SRP Section: 13.03 –Emergency Planning

Question from NRC Licensing and Inspection Branch (EP)

NRC RAI Number: 13.03-17 (eRAI 5997)

In regard to the habitability of the Turkey Point Plant common Technical Support Center (TSC), please address the following questions:

a. The combined license (COL) application incorporates by reference the AP1000 design control document (DCD), which includes inspections, tests, analyses, and acceptance criteria (ITAAC) relating to emergency planning on Table 3.1-1 (see Subsection 3.1, "Emergency Response Facilities," of Tier 1 DCD, page 3.1-2). Design Commitment 6 (ITAAC 6) on Table 3.1-1, including its associated acceptance criteria, addresses the habitability of the Control Support Area (CSA). Identify all applicable habitability requirements (radiological and non-radiological) that apply to the TSC located in the Turkey Point Nuclear Training Building, and describe how they will be satisfied. Identify all applicable sections of the COL application and AP1000 DCD. Further, explain the applicability and relevance of ITAAC 6 to the new TSC location. If it is not applicable, describe how comparable TSC habitability requirements will be met. Finally, address any relationship between your answer to this RAI and your answer to RAI 14.03.10-1, in regard to the disposition of Table 3.1-1 ITAAC 6 (i.e., the exemption request (Tier 1 departure) associated with the disposition of Table 3.1-1).

b. In accordance with Standard Review Plan (SRP) Section 15.0.3 (Acceptance Criterion 3), the staff reviews whether the total calculated radiological consequences in the TSC for the postulated fission product releases fall within the exposure acceptance criteria specified in general design criterion (GDC) 19 of 5 rem TEDE (0.05 Sv) for the duration of the design basis accidents (DBAs). Provide the radiological consequence analyses for the Turkey Point Plant TSC for the postulated DBAs for both the proposed Units 6 and 7 and the existing Units 3 and 4. The DBAs are listed and evaluated in Chapter 15 of the certified AP1000 DCD, Revision 15, and in the AP1000 design certification amendment application (AP1000 DCD, Revision 19) for Units 6 and 7, and are listed and evaluated in Chapter 14 of the Turkey Point Units 3 and 4 UFSAR. The radiological analyses should include, but are not limited to, the following parameters:

    1. TSC ventilation air inlet and recirculation flow rates
    2. HEPA filter and charcoal adsorber fission product removal efficiencies
    3. TSC unfiltered air in-leakage rate
    4. Atmospheric dispersion factors (X/Q values) at TSC air intake for releases from any of the Turkey Point nuclear units
    5. TSC occupancy factors
    6. TSC free air volume

7. Occupant breathing rate
8. Description of the ventilation design

See also, Southern Nuclear Operating Company's June 26, 2009, response to RAI letter number 035 (ADAMS Accession No. ML091810095), and SCE&G's January 7, 2010 response to RAI letter number 074 (ADAMS Accession No. ML100120290) and March 3, 2010, supplemental response to RAI letter number 074 (ADAMS Accession No. ML100630822).

FPL RESPONSE:

Response a: The ITAAC in DCD Tier 1 Table 3.1-1 were prepared in support of the Technical Support Center's (TSC) location in the AP1000 Annex Building (i.e., the control support area). In COLA Part 7, Departure Number PTN DEP 18.8-2, FPL moved the TSC from the control support area to the Turkey Point Units 6 & 7 Nuclear Training Building, located outside of the Protected Areas between the control room for Units 3 & 4 and the main control rooms for Units 6 & 7. Therefore, as stated in FPL's response to RAI 14.03-2 (RAI 14.03.10-1.f (Supplement 1)) dated December 4, 2012, Units 6 & 7 are subject both to the DCD Tier 1, Table 3.1-1 emergency planning ITAAC and to site-specific emergency planning ITAAC related to the site-specific TSC location located in COLA Part 10, Table 3.8-1. Radiological habitability requirements for the TSC are described in Subsection H.1, Emergency Facilities and Equipment, of COLA Part 5, Emergency Plan. The radiological habitability requirements are designed to meet the guidance contained in NUREG-0696 regarding TSC habitability. Habitability ITAAC for the combined Turkey Point TSC are found in COLA Part 10, Table 3.8-1, Item 5.1.4.

Response b:

Standard Review Plan 15.0.3 states that the radiation protection design of the Technical Support Center (TSC) is acceptable if the total calculation radiological consequences for the postulated fission product release fall within the 5 rem Total Effective Dose Equivalent (TEDE) exposure acceptance criteria specified for the Control Room for the duration of the accident. Dose calculations have been completed using bounding TSC design considerations for the facility and the parameters for the ventilation system have been selected to limit the dose in the TSC to less than 5 rem TEDE acceptance criteria of the Standard Review Plan.

AP1000 DCD, Revision 19, Chapter 15 presents an evaluation of Control Room doses following a Loss-of-Coolant Accident (LOCA). Although DCD Section 6.4 shows Control Room doses for other design basis accidents, the LOCA analysis in Chapter 15 is representative of a Control Room habitability evaluation. Following the DCD approach, the site TSC habitability analysis is performed for a LOCA only. At the onset of the LOCA, the TSC is assumed to be in the normal ventilation mode; with the switch to the emergency mode occurring manually based on high radiation readings. It is conservatively assumed that the TSC is isolated and switches to the emergency

ventilation mode 75 minutes into the accident (15 minutes for notification of responders and 60 minutes for activation of the TSC).

The TSC structure and ventilation system, a substructure within the Training Building will be designed to ensure that the TSC personnel are protected from radiological hazards. The TSC will be designed and constructed to support both Units 3 & 4 and Units 6 & 7 and will be located on the second floor of the Training Building. The flow rates are bounding values used for the response to this RAI and the calculation of TSC doses. The boundary of the TSC envelope will be designed and constructed to minimize in-leakage. Unfiltered in-leakage will be less than the assumed value described below. The filtered recirculation flow rate and filter efficiencies are anticipated to be greater than those provided below. Therefore, the amount of radioactivity in the TSC will be less than the calculated values. The following parameters are provided as inputs to the dose calculation for Units 6 & 7 and Units 3 & 4.

TSC Ventilation Air Inlet and Recirculation Rates

The system design provides 1000 cubic feet per minute (cfm) of outside air make-up (unfiltered) to the TSC prior to isolation, after isolation 1000 cfm (filtered). An additional 1000 cfm of air is recirculated through the charcoal cleanup. There is an unfiltered in-leakage rate of 500 cfm during the emergency mode of operation. See the *Description of the Ventilation Design* for more detail.

HEPA Filter and Charcoal Adsorber Fission Product Removal Efficiencies

The system provides 99% removal efficiency for particulates and 90% decontamination efficiency for radioiodine. These efficiencies are consistent with those provided in Table 9.4-1 of Revision 19 of the DCD for the Control Room. No credit was assumed for the high efficiency particulate air (HEPA) filter and charcoal adsorber efficiencies in the determination of TSC dose from Units 3 & 4 or 6 & 7.

Atmospheric Dispersion Factors (X/Q values) at TSC intake

The X/Q values at the TSC air intake are as follows, with the release assumed at ground level from the location of the plant vent. These values which bound the containment shell ground release are calculated using the ARCON96 based on the listed years of meteorological data for Units 3 & 4 and Units 6 & 7:

Units 3 & 4 (2005-2009 Meteorological Data Set)[1]

Containment Leakage Point (Unit 4 Equipment Hatch) to New TSC Intake:

Time duration	X/Q
0-2 hr	1.14E-04 s/m^3
2-8 hr	9.76E-05 s/m^3
8-24 hr	4.42E-05 s/m^3
24-96 hr	3.79E-05 s/m^3
96-720 hr	2.83E-05 s/m^3

Emergency Core Cooling System (ECCS) Leakage Point (Auxiliary Building Vent V-10) to New TSC Intake:

Time duration	X/Q
0-2 hr	1.02E-04 s/m^3
2-8 hr	8.87E-05 s/m^3
8-24 hr	4.30E-05 s/m^3
24-96 hr	3.57E-05 s/m^3
96-720 hr	2.53E-05 s/m^3

Units 6 & 7 (2002, 2005-2006 Meteorological Data Set)[1]

Time duration	X/Q
0-2 hr	2.03E-05 s/m^3
0-8 hr	1.38E-05 s/m^3
8-24 hr	5.83E-06 s/m^3
24-96 hr	4.74E-06 s/m^3
96-720 hr	3.30E-06 s/m^3

[1] The X/Q values for Units 3 & 4 were calculated based on the Units 3 & 4 power uprate. The X/Q values for Units 6 & 7 were calculated as part of the Units 6 & 7 COL application.

TSC Occupancy Factors

The standard Control Room occupancy factors from Regulatory Position 4.2.6 of Regulatory Guide 1.183, July, 2000 are assumed for the TSC dose analysis for Units 3 & 4, with the assumption that the TSC is unoccupied for the first 15 minutes for notification of responders:

0-0.25 hr	0.0 (0%)
0.25-24 hr	1.0 (100%)
24-96 hr	0.6 (60%)
96-720 hr	0.4 (40%)

The occupancy factor for the TSC dose analysis for Units 6 & 7 was conservatively assumed to be 1.0 (100%) for the duration of the accident.

TSC Free Volume

The TSC is approximately 150-ft by 75-ft. The floor area includes the main conference room and other support areas (e.g., NRC Room, communication room, etc.). The floor to ceiling height is 14.5 feet. These dimensions provide a volume of 163,125 ft^3 for the dose evaluation of the facility. The TSC free air volume will be no greater than this value.

Occupant Breathing Rate

The breathing rate of 3.5E-4 m^3/s was conservatively used for the TSC occupant for the duration of the accident calculated separately for Units 3 & 4 and 6 & 7. This rate is consistent with that for the control room operator in Regulatory Position 4.2.6 of Regulatory Guide 1.183, July, 2000.

TSC Dose Calculation

Units 3 & 4

The TSC dose calculation from Units 3 & 4 was performed using the same methodology used for calculating the dose at the existing Units 3 & 4 TSC. Site-specific X/Qs were calculated for the new combined TSC using the 2005-2009 Turkey Point meteorological dataset. The limiting X/Qs for the containment and ECCS release points were used to calculate unfiltered immersion/inhalation doses to TSC occupants. Shine dose to TSC occupants from the containment and emergency core cooling system (ECCS) leakage plumes was calculated assuming a combined TSC ceiling/roof concrete thickness of 12 inches. The containment building shine dose was conservatively assumed to equal that calculated for the existing Units 3 & 4 TSC (Units 3 & 4 TSC is closer to the shine source). As previously stated, no credit was assumed for the HEPA filter and charcoal adsorber efficiencies in the determination of the TSC dose. The calculated 30-day TSC dose is 4.370 rem TEDE, which is less than the 5 rem TEDE acceptance criterion of the Standard Review Plan.

Units 6 & 7

The TSC dose calculation from Units 6 & 7 was performed using the following simplified approach that bounds the proposed design. The DCD provides the LOCA dose at the low population zone (LPZ), along with the associated dispersion factors (X/Qs), which were calculated using the 2002, 2005-2006 meteorological dataset, and breathing rates. Multiplying the time-dependent LPZ doses, as provided by Westinghouse, by the TSC/LPZ ratios of X/Qs and breathing rates and conservatively assuming a 100% occupancy rate for the duration of the accident, the resulting dose is 2.1 rem TEDE, which is less than the 5 rem TEDE acceptance criterion of the Standard Review Plan. This simplified approach is conservative, as it does not take credit for structural shielding, ventilation, or filtration.

Description of the Ventilation Design

The design of the TSC ventilation system is modeled after Figure 1 of Regulatory Guide 1.52, Revision 3, June 2001, with the exception of the installation of moisture separators and heaters in the charcoal unit. During normal operation the system functions as a normal ventilation system providing temperature control, filtration and outside air make-up. In the emergency mode of operation, outside air is drawn through a HEPA filter and an activated charcoal filter assembly before being discharged into TSC spaces. Return air from within the TSC is mixed with the incoming outside air and re-circulated through the filter assembly to minimize airborne contamination and provide for environmental conditioning. In the emergency mode of TSC HVAC operation, the system maintains a 1/8" water gauge positive pressure in the TSC relative to outside by admitting 1000 cfm of outside air. This makeup flow of 1000 cfm provides sufficient ventilation (filtered fresh air) for 100 people. The charcoal adsorber and HEPA unit filters an additional 1000 cfm that is recirculated from the TSC. There is also an assumed unfiltered in leakage of 500 cfm during emergency mode of operation. There is also an unfiltered recirculation rate of approximately 15,000 cfm.

The HVAC system is designed as a non-seismic system and is not provided with redundant fans or filters, as permitted by NUREG-0696 recommendations for the TSC. Each TSC entrance is provided with a vestibule that functions similar to an air lock to minimize air in-leakage due to personnel ingress and egress.

When the TSC HVAC is required for emergency mode of operation, the Training Building HVAC system is isolated from the TSC HVAC system using power-operated dampers. In addition, the Training Building ventilation for the first and third floors is secured.

The Training Building HVAC system components necessary to support the emergency mode of operation are controlled from inside the TSC. Controls may be located within mechanical equipment spaces, but the following controls and indications, as a minimum, are provided in the TSC:

1. Charcoal adsorber temperature
2. Manual filter deluge actuation
3. Radiation monitors

The TSC will be shared between Units 6 & 7 and Units 3 & 4. The main control rooms for Units 6 & 7 are approximately 2400 feet southeast from the TSC. The control room for Units 3 & 4 is approximately 1300 feet northeast from the TSC. There will be an approximate 15 to 20 minute walking time between any control room and the TSC. Use of current technologies such as updated computer networks, and telephone and radio systems for primary and emergency communications will bridge the physical separation. The facility will have access to plant drawings, procedures, and computer applications

needed to support the evaluation and decision making processes of the Emergency Response Organization.

This response is PLANT SPECIFIC.

References:

FPL Letter L-2012-434 to NRC dated December 4, 2012, Revised Response to NRC Request for Additional Information Letter No. 051 (eRAI 6290) SRP Section 14.03 – Inspections, Tests, Analyses, and Acceptance Criteria

ASSOCIATED COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ENCLOSURES:

None