Florida Power & Light Company, P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

L-2003-299

DEC - 9 2003

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

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335, 50-389
Turkey Point Units 3 and 4
Docket Nos. 50-250, 50-251
Seabrook Station
Docket No. 50-443
Generic Letter 2003-01
Control Room Habitability – 180 Day Response

This letter provides the Florida Power and Light Company (FPL) and FPL Energy Seabrook, LLC (FPL Energy Seabrook) 180-day response to Generic Letter (GL) 2003-01, Control Room Habitability. Attachment 1 provides the St. Lucie Unit 1 and Unit 2 response, Attachment 2 provides the Turkey Point Unit 3 and Unit 4 response, and Attachment 3 provides the FPL Energy Seabrook response.

On August 11, 2003, FPL and FPL Energy Seabrook provided 60-day response letters to the subject GL (St. Lucie, L-2003-211, Turkey Point, L-2003-212, Seabrook NYN –03070) where it was conservatively assumed that tracer gas testing planned in August/September 2003 would demonstrate that current design basis in-leakage assumptions may not be met. Thus, each site assumed that the information requested in item 1 of GL 2003-01 could not be provided by the required December 9, 2003, 180-day GL response date. Based on this assumption, each site stated that plans would be made to submit a proposed license amendment to the NRC to adopt the 10 CFR 50.67 alternate source term methodology for assessing the radiological consequences of design basis events.

On October 6, 2003, FPL Energy Seabrook submitted License Amendment Request 03-02, "Implementation of Alternate Source Term" (NYN-03061) requesting implementation of the alternate source term methodology. On September 18, 2003, St. Lucie Unit 1 and St. Lucie Unit 2 submitted License Amendment Requests (L-2003-224 and L-2003-220) requesting implementation of the alternate source term methodology. By letter dated October 8, 2003 (L-2003-259), Turkey Point reported that a license amendment to adopt the 10 CFR 50.67 AST methodology was not required to meet the GL conditions.

If you have any questions, please contact Rajiv Kundalkar at (561) 694-4848.

Sincerely yours,

J. A. Stall
Senior Vice President, Nuclear
and Chief Nuclear Officer

cc: USNRC Regional Administrators RI/RII

A102

Attachment 1
FPL St. Lucie Units 1 and 2
NRC Generic Letter 2003-01
Response to Request for Information

REQUESTED INFORMATION

The following provides the Generic Letter 2003-01 request for information and the St. Lucie Units 1 and 2 responses:

1. **Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing basis.**

Response to Item 1

NEI 99-03, Rev. 1, "Control Room Habitability Guidance," identifies a process to assemble and review the current licensing and design bases for Control Room Habitability (CRH). Using this guidance, FPL assembled, documented, and reviewed the St. Lucie Units 1 and 2 CRH licensing basis, design bases, and relevant analyses. Based on this review, Florida Power & Light confirms that the St. Lucie control room envelope (CRE) and the CRH systems meet the applicable habitability regulatory requirements. This review also confirmed that the CRE and CRH systems are currently designed, constructed, configured, operated, and maintained in accordance with the plant design and current licensing basis described in the Updated Final Safety Analysis Report (UFSAR) with the exception of the unfiltered inleakage into the control room envelope that is discussed further in response 1(a).

To ensure that continued compliance to the CRH design and licensing bases are maintained, the St. Lucie plant intends to develop a control room habitability program by October 30, 2004.

1(a) **That the most limiting unfiltered inleakage into the CRE (and filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analysis for control room habitability. Describe how and when you performed the analysis, tests, and measurements for this confirmation.**

Response to Item 1(a)

St. Lucie conducted a baseline tracer gas test of the CRE to measure the quantity of unfiltered inleakage in September 2003 using the methods of Standard ASTM E741-00. The purpose of this test was to measure the quantity of unfiltered inleakage that could enter the control room during emergency conditions and compare this quantity to the unfiltered inleakage assumed in the design basis radiological analysis contained in the UFSAR.

Inleakage Test Acceptance Criteria

The limiting unfiltered inleakage assumed in the original design for the St. Lucie units differ from Unit 1 to Unit 2. According to the Unit 1 UFSAR, a value of less than 35 cfm was used in the original analysis for control room leakage, which includes leakage from access doors and other penetrations. The Unit 2 UFSAR Chapter 15 analysis assumes a low inleakage rate (less than 10 cfm), including ingress and egress during post-accident conditions.

Pre-Test Repairs of the CRE

As recommended in NEI 99-03, Rev. 1, St. Lucie chose to conduct pre-test maintenance to eliminate suspected leakage paths before performing the baseline test for inleakage. The potential vulnerabilities to unfiltered inleakage identified in the control room boundary walkdowns were prioritized and evaluated for repair. Since the walkdowns identified only minor deficiencies in the CRE, the primary intent of repairs was to implement maintenance on deteriorated door seals, replacement of some control room doors, and perform caulking and sealing of CRE walls. Repairs were made prior to tracer gas testing.

Ventilation System Configuration Lineups Selected for Test

NEI 99-03, Rev. 1 guidance was used to ensure that control room inleakage would be measured under conditions that support the accident analyses contained in the UFSARs. The inleakage test was performed with the CRE, the CRH ventilation systems, and adjacent surrounding room ventilation systems aligned and functioning per design for post-accident conditions.

The St. Lucie designs incorporate both a CRE isolation mode and a CRE pressurization mode. The isolation mode is automatically initiated with a containment isolation signal or high radiation event. The plant operators are permitted to manually re-align the CRH ventilation systems for pressurization mode following the event initiated CRE isolation mode. The most limiting configuration for the tracer gas test was considered to be the isolation mode, where outside makeup air is not available, resulting in the least capability for CRE pressurization. Lower levels of CRE pressurization tend to conservatively increase the potential for unfiltered inleakage into the CRE. St. Lucie tested both configurations with limiting ventilation configurations, including the surrounding room ventilation system alignments to maximize unfiltered inleakage.

Baseline Integrated Control Room Inleakage Test

NUCON performed the control room tracer gas tests to measure control room inleakage. Because the St. Lucie units run initially in the isolated mode during post-accident conditions, the concentration decay test method of ASTM E741-00, as documented in NEI 99-03 was used for this mode of operation.

Since the St. Lucie units run during post-accident conditions in the pressurized mode, the constant injection test method of ASTM E741-00 was used for this mode of operation. The constant injection method for a pressurized control room is also consistent with guidance provided by NEI 99-03.

The inleakage test values are as follows:

	Isolated	Pressurized
Unit 1	290 cfm	444 cfm
Unit 2	207 cfm	0 cfm

The above results are preliminary as the final test report has not been received from the testing vendor. No substantial changes in these results are expected. If substantial changes occur, this submittal will be amended. Note that these results exceed the current UFSAR and accident analysis basis.

A FPL Engineering Evaluation assessed plant operability based on the results of the tracer gas testing measurements. This evaluation and supporting calculations provided a maximum allowable inleakage value for each of the two St. Lucie Units using UFSAR methodology with best-estimate assumptions. The limits on inleakage values documented in this evaluation are 500 cfm for Unit 1 and 430 cfm for Unit 2. With these inleakage values, radiological analyses for CRH meet the GDC 19 acceptance criteria.

Based on the above information, the measured unfiltered inleakage rates using tracer gas testing methodology with worst-case conditions anticipated post-accident are below the values used in the plant operability analysis. Therefore, no compensatory actions are required.

The St. Lucie current licensing bases for the radiological consequences for accidents as described in both UFSARs are based on source term methodologies and assumptions derived from Technical Information Document (TID) 14844. 10 CFR 50.67 was issued by the NRC to permit revising the traditional accident source term used in the design basis accident radiological consequence analyses with the Alternate Source Term. St. Lucie plant has submitted to the NRC a request to implement the use of alternate source term [letters L-2003-220 (Unit 2) and L-2003-224 (Unit 1)]. When approved and implemented, the CRE unfiltered inleakage design bases values will increase based on the use of alternate source term, and the unfiltered inleakage into

the CREs measured during the tracer gas testing will be within design bases values.

1(b) That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessments. This inleakage may differ from the value assumed in your design basis radiological analyses. Also confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

Response to Item 1(b) - Hazardous Chemical Assessment

Toxic Chemicals

Pursuant to NRC requirements of NUREG-0737, a control room habitability report was prepared for Unit 1 showing that control room operators are adequately protected against the effects of accidental release of toxic and radioactive gases and that the plant can be safely operated or shutdown under design basis accident conditions. This report was documented under FPL letter from R.E. Uhrig to D. G. Eisenhut (NRC), Re: St. Lucie Unit 1, Docket 50-335, Post TMI Requirements, L-81-4 dated 1/2/81.

The Unit 2 UFSAR includes a list of hazardous chemical sources that were considered in evaluation of potential accidents. Consideration is limited to those chemicals that are present within a distance of five miles from the control room air intakes. Chemicals stored or situated at distances greater than five miles from the facility are not considered because, if a release occurs at such a distance, wind speed and atmospheric dispersion will dilute and disperse the incoming plume to such a degree that there will be sufficient time for the control room operators to take appropriate action, if any is required. In addition, the probability of a plume remaining within a given sector for a long period of time is quite small. From the hazardous chemicals presented in the UFSAR, only two chemicals, ammonium hydroxide and carbon dioxide were analyzed in more detail. Ammonium hydroxide was assumed in the original UFSAR analysis; however, this chemical is not stored at the plant site. Therefore, ammonium hydroxide poses no threat to the control room operators. The results of the carbon dioxide analysis indicate that the concentrations at the control room HVAC system outside air intake remain below toxicity limits, thus no action is taken by the operators nor are any safety system functions performed.

From the evaluation presented in the UFSAR, the use and storage of potentially hazardous chemicals at the wastewater treatment facility (located at approximately 2 miles south of the site), and the transport of these chemicals to the facility, will have no adverse effect on safe operation of St. Lucie Units 1 and 2.

Chlorine Analysis

The environment around and inside the Unit 1 control room was originally evaluated for an accidental release of chlorine from a one ton storage cylinder. The one ton cylinder has since been removed and the NRC Safety Evaluation Report for license amendment #57 concluded that

the control room ventilation chlorine detectors are no longer required. These detectors are no longer operational in the plant.

Using the guidance of Regulatory Guide 1.78 (R0) and R. G. 1.95, an analysis was performed for Unit 2 to evaluate an accidental release of chlorine and its effect on the control room habitability. The chlorine cylinders were subsequently removed from site; therefore, this chemical hazard does not exist for Unit 2 control room operators.

The circulating water system is treated with chlorine in the form of Sodium Hypochlorite by the use of a hypochlorite system, which precludes the necessity of onsite chlorine storage. This form of the chemical poses no threat to the control room operators.

Chlorine is the principal toxic substance transported by the railroads (2.0 miles west south west of the plant). Since the quantity, per shipment, of chlorine (90 tons) shipped past the site is greater than the adjusted quantity given in Table C-2 of Regulatory Guide 1.78 (R0), the shipments were considered in the hazardous chemical analysis. According to the UFSAR, an overall probability of a chlorine release event that may affect control room habitability is 1.4×10^{-8} per year. Since the probability is less than 10^{-7} per year, the release of chlorine due to a railroad accident is not considered to be a design basis event.

Based on the above information and control room envelope configuration, no hazards exist for the Unit 1 or Unit 2 control room personnel from postulated chemical releases in or around the plant.

Response to Item 1(b) – Smoke Assessment

Should evacuation of the control room be required due to fires or smoke, plant shutdown will be accomplished and monitored from the alternate shutdown panel with local operation of selected shutdown equipment. Alternate shutdown is accomplished in accordance with plant procedures. Plant procedures for a shutdown from outside the control room due to a fire are based on the Appendix "R" Safe Shutdown Analysis. The alternate shutdown panel is provided with ventilation that is independent from the CRE.

Florida Power & Light has evaluated the potential for smoke from a single fire to preclude safe shutdown of the plant from either the control room or the alternate shutdown panel on each unit. This evaluation has determined that there is no single fire that could disable the use of both the control room and the alternate shutdown panel due to smoke. The ventilation systems for the control room and alternate shutdown panel areas are independent of each other. The alternate shutdown panel is located on a different floor elevation than the control room, and it is located in a different fire area. For a fire in the cable spreading room that disables the control room, control of the unit is provided from the alternate shutdown panel. A fire in the alternate shutdown panel area will not migrate into the control room due to the independent ventilation systems. Fire dampers exist to prevent migration of fire/smoke from the alternate shutdown panel to the cable spreading room.

Based on the above information and CRE configuration, reactor control capability is maintained

from either the control room or the alternate shutdown panel in the event of smoke for both units. There is no single fire that could disable the use of both the control room and the alternate shutdown panel due to the existence of smoke.

1(c) **That your technical specifications verify the integrity of the CRE, and the assumed inleakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for:**

1) **revising the surveillance requirement in your technical specifications to reference an acceptable surveillance methodology (e.g., ASTM E741), and**
2) **making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.**

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

Response to Item 1(c)

St. Lucie Units 1 and 2 Technical Specification 3/4.7.7 contain the operability and surveillance requirements of the control room ventilation systems. The Technical Specifications include a control room ΔP surveillance requirement to demonstrate CRH ventilation system operability.

As discussed above in the response to NRC requirement 1(a), integrated control room tracer gas testing to measure unfiltered inleakage was performed in September 2003 for both Units. These tests confirmed that unfiltered inleakage into the control rooms for conditions similar to accident conditions was higher than the UFSAR limits, but within plant operability limits. This determination demonstrated that this testing is more effective than the technical specification surveillance requirement provided above, for making an assessment of CRE integrity. Therefore, the control room ΔP surveillance testing requirements are not adequate for verifying the integrity of the CRE.

Based on staff approval of Technical Specifications Task Force (TSTF) TSTF-448 by April of 2004, a License Amendment request will be submitted by October 30, 2004.

2. **If you currently use compensatory measures to demonstrate control room habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.**

Response to Item 2

No interim compensatory measures are required to demonstrate control room habitability at St. Lucie Units 1 and 2. Therefore, this request does not apply to St. Lucie Units 1 and 2.

3. **If you believe your facility is not required to meet either the GDC, the draft GDC, or the "Principal Design Criteria" regarding control room habitability, in addition to responding to 1 and 2 above, provide documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence) of the basis for this conclusion and identify your actual requirements.**

Response to Item 3

St. Lucie is required to meet the draft GDCs for Unit 1 and the GDCs for Unit 2. Therefore, this request does not apply to St. Lucie Units 1 and 2.

Attachment 2
FPL Turkey Point Units 3 and 4
NRC Generic Letter 2003-01
Response to Request for Information

REQUESTED INFORMATION

The following provides the Generic Letter 2003-01 requests for information and the Turkey Point Units 3 and 4 responses:

1. **Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases.**

Turkey Point Response to Item 1

NEI 99-03, Rev. 1, "Control Room Habitability Guidance," identifies a process to assemble and review the current licensing and design bases for Control Room Habitability (CRH). Using this guidance, FPL assembled and reviewed the Turkey Point Units 3 and 4 CRH current licensing bases, design bases, operating and surveillance procedures, and relevant analyses.

The request for information referenced five 10 CFR 50 Appendix A general design criteria (GDC) as examples of regulatory requirements (GDC 1, 3, 4, 5, and 19) that are related to control room habitability. Turkey Point Units 3 and 4 received construction permits prior to issuance of the proposed Appendix A to 10 CFR 50 and therefore the current licensing bases include aspects of the 1967 proposed criteria. Although numbered and worded somewhat differently, the 1967 proposed GDC have equivalent versions of the criteria that address the same concepts as the 10 CFR 50 Appendix A GDC. These criteria are met except when superceded by more recent regulations. For example, 1967 GDC 3 (similar to 10 CFR 50 Appendix A GDC 4 on fire protection) has been replaced by the Turkey Point regulatory commitments to 10 CFR 50 Appendix R. Also, as discussed below, 1967 GDC 11 (control room) has been superceded by the Turkey Point commitment to GDC 19 of 10 CFR 50 Appendix A. It should be noted that the single train control room ventilation system (CRVS) is designed and licensed as an emergency system and is not an engineered safety system. The design basis of the CRVS with respect to radiological emergencies is to be capable of automatically starting under accident conditions to initiate control room pressurization and filtration, assuming the occurrence of a single active damper or supply fan failure. The design basis of the system with

respect to other emergencies that could affect the control room environment is to be capable of manual actuation.

In response to NUREG-0737, Item III.D.3.4, Turkey Point committed to meet the intent of 10 CFR 50 Appendix A GDC 19 in a letter to the Staff dated August 9, 1983. Control room modifications were implemented to meet the intent of GDC 19. By letter dated November 25, 1983 and later supplemented on May 8, 1985 based on additional FPL information, the NRC Staff issued Safety Evaluation Reports which concluded that the FPL control room modifications for Turkey Point were acceptable and in accordance with the guidance of NUREG-0737.

A review of plant procedures that address the operation, surveillance and testing of the CRVS did not identify any discrepancies between the current plant configuration and operation with respect to the plant licensing and design bases.

Based upon the review performed under the guidance of NEI 99-03, Rev. 01, and the results of the completed control room inleakage test discussed in the response to 1(a), Florida Power & Light confirms that the Turkey Point control room CRE and CRVS meet the applicable habitability regulations and are designed, constructed, configured, operated, and maintained in accordance with the plant design and current licensing bases described in the updated final safety analysis report (UFSAR).

To ensure that continued compliance to the CRH design and licensing bases is preserved, Turkey Point will implement the control room habitability program as discussed in the response to 1(c).

1(a) That the most limiting unfiltered inleakage into the CRE (and the filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analyses for control room habitability. Describe how and when you performed the analyses, tests, and measurements for this confirmation.

Turkey Point Response to Item 1(a)

Turkey Point conducted a baseline tracer gas test of the control room envelope (CRE) to measure the quantity of unfiltered inleakage in August 2003 using the constant injection method of Standard ASTM E741-00, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution." The purpose of this test was to measure the quantity of unfiltered inleakage that could enter the control room during emergency conditions and compare this quantity to the unfiltered inleakage assumed in the design basis radiological analyses contained in the UFSAR. Preparations for the tracer gas test included assessments and walkdowns to identify leakage vulnerabilities and repairs using the guidance contained in NEI 99-03, Rev. 01.

Turkey Point Units 3 and 4 share a common control room located in the control building, which is attached to but separate from the auxiliary building. The CRE consists of the control room, including the control room offices, rack area, kitchen and lavatory and the mechanical equipment room (MER) located below the control room in the southwest corner of the cable spreading room. The MER contains the control room ventilation system (CRVS) equipment including the air handling units, emergency fans, ductwork, HEPA and charcoal filters. Both rooms are considered part of the same envelope since both are serviced and pressurized by control room air handlers through common ductwork. The boundaries of the CRE are the walls, floors, dampers, doors, and ductwork of the two rooms.

In 1981, a control room habitability study performed in response to Item III.D.3.4 of NUREG-0737 stated that the LOCA had been determined to be the most severe accident with regards to control room dose. The radiological analyses and consequences of the large break LOCA are discussed in UFSAR Section 14.3.5. These analyses were updated circa 1995 during the Thermal Power Uprate Project. The limiting radiological analysis for the LOCA described in the UFSAR assumes 10 cubic feet per minute (cfm) of unfiltered inleakage into the CRE. Although it is not stated in the UFSAR, the 10 cfm of unfiltered inleakage is assumed to come from control room ingress and egress. The modeled ingress and egress rate is consistent with guidance contained in Regulatory Guide 1.197 and NEI 99-03, Rev. 1. This design basis assumption implies that, due to CRE pressurization, no other source of filtered and unfiltered inleakage exists in the Turkey Point control room.

The tracer gas test acceptance criteria is a measured unfiltered inleakage into the CRE of zero cfm. The total unfiltered inleakage (adjusting for 10 cfm for ingress and egress) would be within the limits already analyzed in the UFSAR.

The guidance provided in Appendix D (Testing Program) of NEI 99-03, Rev. 01 was used to ensure that control room inleakage would be measured under conditions that support the accident analyses contained in the UFSAR. The inleakage test was performed with the CRE, the CRVS, and adjacent ventilation systems aligned and functioning the way they would if a radiological event were to occur as discussed below.

The most limiting CRVS configuration for the tracer gas test is that which provides the smallest filtered makeup flow, resulting in the least CRE pressurization. Lower levels of CRE pressurization would tend to conservatively increase the potential for unfiltered inleakage to enter the CRE. The CRVS alignment selected for the inleakage test is the same configuration expected following control room emergency isolation (pressurization), while additionally assuming that one of two parallel emergency intake dampers fails to open (single active failure). An assessment has shown that because of differences in the redundant emergency intake duct lengths, the failure of the west emergency intake damper to open automatically would provide the smallest quantity of filtered makeup for pressurization. Filtered makeup air entering the control room through only the east emergency duct minimizes the level of CRE pressurization when compared to having both the

east and west dampers open, or only the west damper open.

Generic Letter 2003-01 identified two possible unrecognized contamination pathways into the CRE that could effect the pressurization of the CRE under accident conditions. These potential pathways consisted of CRVS fan suction ductwork located outside of the CRE and pressurized ducts that traverse the CRE en route to another plant area. At Turkey Point, with the exception of the HVAC condensing units that are located on the control building roof, the entire control room ventilation system is located within the CRE. The air handling units, emergency fans, HEPA filter, charcoal filter, and associated recirculation dampers are all housed within the MER. The MER is considered part of the CRE because it is also serviced and pressurized by the control room air handlers through common ductwork. This design feature tends to reduce unfiltered inleakage into the CRE. Also, no other ventilation systems have ducts that traverse the CRE. Therefore, there are no potential sources of unfiltered inleakage from ventilation systems that could operate at a higher pressure than the CRE and influence the control room pressure.

NUCON International, Inc. (NUCON) performed the baseline integrated control room tracer gas testing to measure control room inleakage during the week of August 18, 2003. Since the Turkey Point control room is pressurized, the constant injection test method of ASTM E741-00 was selected. The selection of the constant injection method for a pressurized control room is consistent with guidance provided by NEI in Appendix D (Testing Program) of NEI 99-03, Rev. 01.

During the test, atmospheric pressure measurements in the control room, MER and adjacent areas were taken that confirmed that the CRE was at a positive pressure compared to these areas including the outside environment.

The results of the tracer gas test determined that the average total control room inleakage (filtered plus unfiltered) was 371 $\pm$ 5.6 scfm and that the average outside airflow (filtered makeup only) was 372 $\pm$ 4.5 scfm. These values resulted in an average quantity of unfiltered inleakage into the Turkey Point CRE of zero $\pm$ 7.2 scfm. The uncertainties are based on a 95% confidence limit. Since the test results show that Turkey Point has a low inleakage control room, the uncertainties are not included in the test results as allowed by Regulatory Guide 1.197.

To summarize, the constant tracer gas injection leakage test performed on the CRE for Turkey Point Nuclear Plant Units 3 and 4 demonstrated that the CRE is at a positive pressure compared to all adjacent areas and that the outside airflow (filtered makeup) is the only source of inleakage to the envelope in the emergency mode. Therefore, the measured unfiltered inleakage value of zero (0) scfm meets the assumptions made in the current licensing basis accident analyses contained in the UFSAR.

1(b) That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessments. This inleakage may differ from the value assumed in your design basis radiological analyses. Also, confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

Turkey Point Response to Item 1(b) - Hazardous Chemical Assessment

A study was performed circa 1981 (FPL letter to NRC, L-81-285) to assess the potential effects of spills or accidental releases from hazardous chemicals stored on or in close proximity to Turkey Point. This study indicated that the hazardous chemical inventories were considered quite low in 1981 and concluded that there were no hazards from postulated hazardous chemical incidents. Turkey Point was not designed to the Standard Review Plan, and therefore has no commitment to Regulatory Guides 1.78 or 1.95.

The hazardous chemical inventory was based on a walkdown of all site (fossil and nuclear) facilities. Identified inventories were considered typical as found or, if designated areas seemed barren, conservative values for hazardous chemical types and quantities were selected for evaluation. The meteorological conditions were assumed to be stable with a light breeze in the worst direction. Breezes were assumed to be "slight" to minimize dispersion but enough to move the plume toward the Control Room. No off-normal (emergency) CRVS operation was required.

A walkdown was performed in 2002 to assess effects on control room habitability due to fire or chemical release. It was noted during the evaluation documenting the reviews that hazardous chemical inventories had been either reduced or relocated more remotely from the control room than the as-found conditions evaluated circa 1981.

The tracer gas test confirmed that the design basis control room inleakage remained valid at 10 cfm (including ingress and egress). Since the quantity of hazardous chemicals on site has been reduced or relocated away from the control room, no hazards exist to control room personnel from postulated hazardous chemical incidents.

Turkey Point Response to Item 1(b) - Smoke

The CRE consists of the control room (Fire Zone 106) and the mechanical equipment room (Fire Zone 97). Smoke in the control room could originate from within the control room or from the outside. The likelihood of a significant fire developing in the control room is considered remote because the room is continuously occupied and the facilities are mostly constructed of non-combustible material. Furthermore, provision is made in the stations' control room evacuation procedure to safely shutdown the plant using the Alternate Shutdown Panels and associated manual actions in the event control room evacuation is required due to fire.

The potential for smoke intrusion from adjacent rooms is considered minimal based on pressure boundary integrity and low potential for inleakage. However, there is more potential for smoke intrusion or induction to the control room from outside via access doors and supply air intakes such that habitability depends to a large extent on the nature of local outdoor events and meteorology affects.

Smoke from combustion can be particularly noxious if pervasive. Even so, most such sources would have little or no impact on habitability for control room personnel. Taking a panoramic view, smoke generated by a fire in the surrounding marsh area, fossil plant effluent or fire involving bulk oil storage tanks is unlikely to enter the control room based on distance and prevailing winds. Prevailing breezes are southeasterly and most sources are downwind or parallel in the wind stream. Even during a temperature inversion, smoke would tend to rise above the zone-of-influence due to combustion product (smoke/hot gas) buoyancy. Concentration of ash being drawn through the air intakes would be incidental and of insufficient substance to clog filters and compromise CRVS operation. In addition, a recent evaluation of postulated fires or explosions concluded that control room habitability would not be compromised.

In perspective, habitability of control room personnel is more likely to be affected by a localized fire than a panoramic fire. In context of Thermo-Lag upgrades, a large pool oil fire was postulated to result from the catastrophic failure of a turbine bearing (FPL letter to NRC, L-97-181). To a certain extent, migration of smoke toward the control building could be mitigated by dispersal in the open turbine building, through the sides and away from the control building by the prevailing breeze from easterly directions. However, such fire conditions could cause smoke intrusion to the control room through the normal intake.

The alternate shutdown system is independent of the cable spreading room. Alternate shutdown panels are located in the respective 4160V 'B' switchgear rooms of each unit. All cables and components necessary to achieve safe shutdown, using the alternate shutdown panel, are independent of the control room, N-S breezeway, cable spreading room, mechanical equipment room and control room roof.

Both switchgear buildings are similar, but Unit 4 is in closest proximity to the control building and, therefore, access is more vulnerable to effects of a fire in local outdoor areas. There are four entrances to each switchgear building, one from the east mezzanine area, two from the east at grade elevation and one from the southwest grade. With the intervening condensate pump pit it is extremely unlikely that one fire could prevent access to all entrances. Furthermore, all entrances can be accessed via key so that the key-card security system operability is not credited.

Based on the preceding, smoke events would not compromise safe control or shutdown of the nuclear reactors.

1(c) That your technical specifications verify the integrity of the CRE, and the assumed inleakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

Turkey Point Response to Item 1(c)

Turkey Point does not have a technical specification surveillance requirement for CRE integrity (ΔP surveillance requirement). The Turkey Point technical specifications contain control room emergency ventilation system operability and surveillance requirements to assure the filtration of fresh makeup air and the removal of radioactivity from the pressurized control room.

As discussed in our response to 1(a), Turkey Point conducted a baseline tracer gas test of the CRE to measure the quantity of unfiltered inleakage in August 2003 using the constant injection method of Standard ASTM E741-00. The completed integrated tracer gas test confirmed that the Turkey Point CRE integrity has been maintained consistent with the current licensing basis of the radiological analyses contained in the UFSAR.

Turkey Point will implement a CRH program including periodic assessments and inleakage testing based on the guidance contained in NEI 99-03, Rev. 01. This program will consist of the one-time baseline test (already performed as discussed in the response to 1(a)), followed by periodic inleakage assessment and retest activities. A control room assessment will be performed three years after the baseline test and a periodic retest will be performed three years following the assessment. Administrative portions of the program will address procedure control, plant configuration control and CRE barrier breach control. The proposed CRH program will include periodic verification of control room integrity using inleakage values assumed in the licensing basis as acceptance criteria. This program will ensure that control room habitability is maintained in accordance with NRC regulations and licensee commitments. The CRH program will be implemented August 30, 2004.

2. **If you currently use compensatory measures to demonstrate control room habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.**

Turkey Point Response to Item 2

No compensatory measures to demonstrate control room habitability are required at Turkey Point Units 3 and 4. Therefore, this request does not apply to Turkey Point units 3 and 4.

3. **If you believe that your facility is not required to meet either the GDC, the draft GDC, or the "Principal Design Criteria" regarding control room habitability, in addition to responding to 1 and 2 above, provide documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence) of the basis for this conclusion and identify your actual requirements.**

Turkey Point Response to Item 3

Turkey Point is required to meet the 1967 draft GDC as well as 10CFR50 Appendix A GDC 19. Therefore, this request does not apply to Turkey Point Units 3 and 4.

Attachment 3
FPL Energy Seabrook
NRC Generic Letter 2003-01
Response to Request for Information

REQUESTED INFORMATION

The following provides the Generic Letter 2003-01 requests for information and the FPL Energy Seabrook responses:

1. **Provide confirmation that your facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the CRHS's are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing basis.**

Seabrook Response to Item 1

The original design and licensing basis of the Seabrook Control Room Envelope and associated habitability systems is documented in the Seabrook Station Final Safety Analysis Report. The current facility design and licensing basis is reflected in the Updated Final Safety Analysis Report (UFSAR). The existing design meets all of the applicable regulatory requirements regarding Control Room habitability. FPL Energy Seabrook confirms that the Seabrook Station Control Room Envelope and Control Room Habitability Systems (CRHS's) meet the applicable habitability requirements. This review has also confirmed that the Control Room Envelope and Control Room Habitability Systems are currently designed, constructed, configured, operated and maintained in accordance with the plant design and current licensing basis described in the UFSAR with the exception of the unfiltered inleakage into the Control Room Envelope that is discussed further in response 1.(a).

1.(a) **That the most limiting unfiltered inleakage into the CRE (and filtered inleakage if applicable) is no more than the value assumed in your design basis radiological analysis for control room habitability. Describe how and when you performed the analysis, tests, and measurements for this confirmation.**

Seabrook Response to Item 1.(a)

UFSAR Section 15.6.5.4.e identifies the limiting unfiltered inleakage into the Control Room Envelope, used in the design basis radiological dose analysis, as one cubic foot per minute (cfm) based on the low anticipated usage of the single door emergency fire exit. Zero cfm of unfiltered

inleakage is assumed through the primary ingress and egress double door exit. The limiting unfiltered inleakage has remained unchanged from that used in FSAR Amendment 63. A single train of the Seabrook Control Room Emergency Makeup Air and Filtration System supplies up to 600 cfm of filtered makeup air to the Control Room Envelope. This makeup air is adequate to maintain the Control Room Envelope at a pressure at least 1/8" w.g. greater than the outside atmospheric pressure and the Cable Spreading Room pressure. This is confirmed at least once every 18 months by Technical Specification Surveillance Requirement 4.7.6.1.d.4. Based on maintaining this positive pressure in the Control Room Envelope, the only unfiltered inleakage is the 1 cfm from the limited usage of the single door emergency fire exit. This results in an unfiltered inleakage of zero cfm from all other sources.

FPL Energy Seabrook conducted a baseline tracer gas test of the Control Room Envelope to measure the quantity of unfiltered inleakage in August 2003. The test was performed using the constant injection method of American Society for Testing and Materials (ASTM) Standard ASTM E741-00, 2000, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution."

NUCON International assisted FPL Energy Seabrook in the performance of the baseline integrated Control Room tracer gas testing to measure control room inleakage. Since the Seabrook Station Control Room is pressurized, NUCON selected the constant injection test method of ASTM E741-00. The selection of the constant injection method for a pressurized control room is consistent with guidance provided by NEI in NEI 99-03, Revision 1.

In preparation for performing this test, the limiting configuration for operation of the Control Room Emergency Makeup Air and Filtration System and adjacent area ventilation systems was established. Single train operation of the Control Room Emergency Makeup Air and Filtration System is the limiting configuration with respect to emergency system operation since it has been demonstrated in Control Room operator dose analysis that single train operation results in a higher dose to the Control Room operators.

Based on the limiting configuration being one train of Control Room Emergency Makeup Air and Filtration System operating, tracer gas testing was performed, with the A Train operating and with the B Train operating. The following are the results of this test:

Filter Train Operating	Unfiltered Inleakage	Filtered Flow
A	14 ± 22 SCFM	443 ± 17 SCFM
B	8 ± 10 SCFM	427 ± 7 SCFM

The uncertainties are based on a 95% confidence level. The above results are preliminary. The final test report has not been received from the testing vendor. No substantial changes in these results are expected. However, if substantial changes occur, this submittal will be amended.

During the testing, atmospheric pressure measurements in the Control Room Envelope and adjacent areas were taken. These measurements confirmed that the Control Room Envelope was at a positive pressure compared to the adjacent areas including the outside. This positive pressure exceeded the 1/8" w.g. design criteria. Also, the filtered flow measured meets the single train design basis flow of ≤ 600 CFM.

The measured unfiltered inleakage exceeds the current design bases value. This was evaluated under the Seabrook Station Corrective Action Program. The Control Room Envelope was

determined to remain operable with this additional unfiltered inleakage. Operability is based on a calculation of the Control Room operator doses due to additional unfiltered inleakage using best estimate values. This calculation is based on the Technical Information Document (TID) 14844, "Calculation of Distance Factors for Power and Test Reactors (1962)" methodology that Seabrook Station is currently licensed. This calculation demonstrated that the Control Room operator dose limits of GDC-19 are met with unfiltered inleakages up to 510 cfm based on single train operation, which is the most limiting configuration. There are no compensatory actions required.

The current Seabrook Station licensing basis for the radiological consequences analyses for accidents discussed in Chapter 15 of the UFSAR is based on source term methodologies and assumptions derived from Technical Information Document (TID) 14844, "Calculation of Distance Factors for Power and Test Reactors (1962)". 10CFR50.67 was issued by the NRC to permit revising the traditional accident source term used in the design basis accident radiological consequences analyses with the Alternative Source Term (AST). License Amendment Request (LAR) 03-02, "Implementation of Alternate Source Term," was submitted to the NRC on October 6, 2003 by letter NYN-03061. When LAR 03-02 is approved and implemented, the Control Room Envelope unfiltered inleakage design bases value will increase based on the use of the alternative source term, and the unfiltered inleakage into the Control Room Envelope measured during tracer gas testing will be within the revised design bases.

1(b) That the most limiting unfiltered inleakage into your CRE is incorporated into your hazardous chemical assessments. This inleakage may differ from the value assumed in your design basis radiological analyses. Also confirm that the reactor control capability is maintained from either the control room or the alternate shutdown panel in the event of smoke.

Seabrook Response to Item 1(b) – Hazardous Chemical Assessment

Seabrook Station compliance to RG 1.78 and 1.95 is documented in FSAR Amendment 63, Section 1.8. The Hazardous Chemical Assessment is documented in FSAR Section 2.2.3.1.c. Essentially, a toxic chemical hazard does not exist on site or in the vicinity of the plant. As a result, toxic gas protection of the Control Room operators is not required (FSAR Section 6.4.4.2). The UFSAR identifies more updated evaluations in 1988 and 1989. The most recent UFSAR Transportation Review and Update was performed in 2001. This evaluation continues to document that a toxic chemical hazard does not exist on site or in the vicinity of the plant. The unfiltered inleakage value measured during tracer gas testing does not have any impact on the hazardous chemical assessment for Seabrook Station.

Seabrook Response to Item 1(b) – Smoke

Unfiltered inleakages of 8 and 14 SCFM were measured during single train Control Room Emergency Makeup Air and Filtration System operation. Concurrently, fresh air flows into the Control Room Envelope were measured at 427 and 443 SCFM. This provides in excess of a 30

to one dilution factor for any smoke that enters the Control Room Envelope as a result of this additional unfiltered inleakage.

The additional unfiltered inleakage measured during tracer gas testing is not sufficient to require evacuation. In the event that Control Room evacuation is required, no single fire could prevent operators from exiting the Control Room and proceeding to the remote shutdown locations in the Essential Switchgear Rooms.

1(c) **That your technical specifications verify the integrity of the CRE, and the assumed inleakage rates of potentially contaminated air. If you currently have a ΔP surveillance requirement to demonstrate CRE integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of ASTM E741 testing results. If you conclude that your ΔP surveillance requirement is no longer adequate, provide a schedule for 1) revising the surveillance requirement in your technical specifications to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE so that compliance with your new surveillance requirement can be demonstrated.**

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

Seabrook Response to Item 1(c)

The Limiting Conditions for Operation and Surveillance Requirements for the Seabrook Control Room Emergency Makeup Air and Filtration System are contained in Technical Specification 3.4.7.6, "Control Room Subsystems Emergency Makeup Air and Filtration". Surveillance Requirement 4.7.6.1.d.4 addresses the ΔP surveillance described above. Tracer gas testing has demonstrated that the ΔP surveillance is not by itself adequate to demonstrate Control Room Envelope integrity.

FPL Energy Seabrook already maintains the control room envelope under other programs, and will submit a license amendment request to adopt the changes as recommended in the Technical Specifications Task Force (TSTF) TSTF-448 as they apply to Seabrook Station. Based on staff approval of TSTF-448 by April of 2004, a license amendment request will be submitted by October 30, 2004.

2. **If you currently use compensatory measures to demonstrate control room habitability, describe the compensatory measures at your facility and the corrective actions needed to retire these compensatory measures.**

Seabrook Response to Item 2

There are no compensatory measures to demonstrate control room habitability at Seabrook Station. Therefore, this request does not apply to Seabrook Station.

3. **If you believe your facility is not required to meet either the GDC, the draft GDC, or the "Principal Design Criteria" regarding control room habitability, in addition to responding to 1 and 2 above, provide documentation (e.g., Preliminary Safety Analysis Report, Final Safety Analysis Report sections, or correspondence) of the basis for this conclusion and identify your actual requirements.**

Seabrook Response to Item 3

Seabrook Station is required to meet the GDC as documented in the Seabrook Station Final Safety Analysis Report and the Updated Final Safety Analysis Report. Therefore, this request does not apply to Seabrook Station.