Florida Power & Light Company, 9760 SW 344 St., Fla City, FL 33035

FPL

L-2001-61
10 CFR 54

MAR 3 0 2001

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

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Request for Additional Information for the Review of the Turkey Point Units 3 and 4 License Renewal Application

By letter dated February 2, 2001, the NRC requested additional information regarding the Turkey Point Units 3 and 4 License Renewal Application (LRA). Attachment 1 to this letter contains the responses to the Requests for Additional Information (RAIs) associated with Subsection 3.6.1, Containment and Subsection 3.6.2, Other Structures of the LRA.

Should you have any further questions, please contact E. A. Thompson at (305)246-6921.

Very truly yours,

R. J. Hovey
Vice President - Turkey Point

RJH/EAT/hlo

Attachment

A084

cc: U.S. Nuclear Regulatory Commission, Washington, D.C.

Chief, License Renewal and Standardization Branch
Project Manager - Turkey Point License Renewal
Project Manager - Turkey Point

U.S. Nuclear Regulatory Commission, Region II
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

Other

Mr. Robert Butterworth
Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, FL 32399-1050

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circle, SE, Bin #C21
Tallahassee, FL 32399-1741

Mr. Joe Meyers, Director
Division of Emergency Management
2555 Shumard Oak Drive
Tallahassee, FL 32399-2100

County Manager
Miami-Dade County
111 NW 1 Street 29th Floor
Miami, FL 33128

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street NW
Suite 400
Washington, D.C. 20006

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251

Response to Request for Additional Information for the Review of the Turkey Point Units 3 and 4, License Renewal Application

STATE OF FLORIDA)
) ss
COUNTY OF MIAMI-DADE)

R. J. Hovey being first duly sworn, deposes and says:

That he is Vice President - Turkey Point of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

R. J. Hovey

Subscribed and sworn to before me this

30 day of March, 2001.

Olga Hanek

Olga Hanek
Name of Notary Public (Type or Print)

OLGA HANEK
MY COMMISSION # CC 926970
EXPIRES: June 18, 2004
Bonded Thru Notary Public Underwriters

R. J. Hovey is personally known to me.

ATTACHMENT 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION DATED FEBRUARY 2, 2001 FOR THE REVIEW OF THE TURKEY POINT UNITS 3 AND 4, LICENSE RENEWAL APPLICATION

RAI 3.6.1.1-1:

Section 3.6.1.1.1 states, "the groundwater parameters for chlorides and sulfates exceeded the threshold limits where degradation may occur." Sections 3.6.1.1 and 3.6.2.3 identify aggressive chemical attack as an aging mechanism that can lead to either change in material properties for containment structure concrete components and/or loss of material for concrete structural components that are located below groundwater elevation, exposed to saltwater flow, or exposed to saltwater splash. The aging management program used to manage these aging effects for these two structural components, systems and structures Monitoring Program, does not include any detailed information in Section 3.2.15 of Appendix B of the LRA to address the aggressive chemical attack for concrete containment and structural components. Provide a description of the aging management program plans for addressing this aging mechanism.

FPL RESPONSE:

The aging effects loss of material and change in material properties require aging management for reinforced concrete below groundwater. Reinforced concrete below groundwater (potentially exposed to aggressive chemical attack) is limited to the following structures:

- Containment (a small portion of the base slab and the reactor pit)
- Auxiliary Building (residual heat removal pump and heat exchanger rooms)
- Discharge Structure (safety related intake cooling water pipe headwalls)
- Intake Structure

Note: The Containment and Auxiliary Buildings are not exposed to saltwater flow or saltwater splash.

As described in the LRA Appendix B, Section 3.2.15 (page B-83), the Systems and Structures Monitoring Program (SSMP) is credited for managing aging of these concrete structures located below groundwater. The SSMP will manage aging of concrete below groundwater for the Auxiliary Building, Intake Structure, and Discharge Structure by requiring direct visual inspections of exposed surfaces of these concrete structures. For the Containment Building concrete below groundwater, which is inaccessible, the SSMP will require visual inspections of the non-safety related tendon access gallery concrete below groundwater to provide early indication of potential aging effects for the containment concrete. Inspecting the tendon access gallery as an indicator for potential aging of the containment concrete is conservative for the following reasons:

1. Both the tendon access gallery and the containment concrete are located at or below groundwater levels.

2. Both the tendon access gallery and the containment concrete are protected by waterproofing membranes and waterstops.

3. The tendon access gallery walls are 12 - 14 inches thick. The containment basemat and reactor pit walls are 60 - 126 inches thick.

4. The quality of concrete material utilized in the safety related containment structure is the same or better than the concrete used in the non-safety related tendon access gallery.

5. The containment concrete is more heavily reinforced than the tendon access gallery concrete, thus providing greater resistance to shrinkage cracks. This reinforcement inhibits aging due to aggressive chemical attack.

Visual inspections of exposed surfaces of concrete below groundwater will look for signs of degradation (e.g., concrete cracking, spalling, scaling, leaching, discoloration, groundwater in-leakage, or rust stains).

RAI 3.6.1.2-1:

Table 3.6-2 of the LRA does not list attachment welds to the containment shell as an item requiring aging management. Welds between integral attachments to the primary containment have a pressure boundary intended function as well as a structural support intended function and are included within the scope of ASME Section XI, Subsection IWE. As such, provide justification for not including attachment welds to the containment shell as an item requiring aging management or, alternatively, describe the aging management program that manages the aging of these attachment welds. In addition, provide justification if the requirements of this aging management program are less stringent than the requirements for attachment welds that are included in ASME Section XI, Subsection IWE.

FPL RESPONSE:

Section 2.4.1.1.2 (page 2.4-4) of the LRA discusses attachments to the containment liner. Attachment welds between structural attachments and the pressure-retaining boundary are included in Table 3.6-2, (page 3.6-51) in the commodity group "Liner plate anchorages/attachments exposed surfaces." Table 3.6-2 will be revised to clarify that attachment welds are included in the referenced line item. The ASME Section XI, Subsection IWE Inservice Inspection Program and the Boric Acid Wastage Surveillance Program manage aging of these attachment welds.

The commodity group "Liner plate anchorages/attachments" which are embedded/encased in concrete have no aging effects because the concrete offers adequate protection from environmental factors that could cause aging. The Turkey Point Containments were designed using high quality concrete as described in the FPL response to RAI 3.6.1.2-4.

RAI 3.6.1.2-2:

Table 3.6-2 of the LRA lists fuel transfer tube blind flanges, non-safety related pipe segments, radiant energy shields, and reactor vessel supports as items made of stainless steel. Section 3.6.1.5 of the LRA provides only a brief explanation for concluding that these items do not require aging management. Provide a more detailed explanation for not requiring an aging management program for these components, particularly with respect to cracking of the radiant energy shields and reactor vessel supports due to stress corrosion cracking and thermal fatigue.

FPL RESPONSE:

As stated in LRA Appendix C, Section 5.2 (page C-18), cracking is non-ductile failure of a component due to stress corrosion, fatigue, or embrittlement. Stress corrosion cracking (SCC) requires a combination of a susceptible material, a corrosive environment, and tensile stress. Cracking due to thermal fatigue requires cyclic thermal stresses beyond the material endurance limit.

The stainless steel components discussed in the RAI (fuel transfer tube blind flanges, non-safety related pipe segments, radiant energy shields, and reactor vessel supports) are all in a dry environment (i.e., containment air). They are not exposed to the corrosive environment necessary to cause stress corrosion cracking. Consequently, stress corrosion cracking is not an aging effect requiring management for these components.

By design, the components discussed in the RAI are not exposed to cyclic thermal stresses of the quantity or magnitude necessary to cause thermal fatigue. Consequently, thermal fatigue is not an aging effect requiring management for these components. See LRA Section 4.3.4 (page 4.3-6) for additional discussion of piping fatigue.

RAI 3.6.1.2-3:

Table 3.6-2 of the LRA lists the steam generator support material (lubrite) as a material subject to AMR. However, no discussion is provided in Section 3.6.1.5 of the LRA to justify its exclusion from items requiring aging management. Provide a detailed discussion of your basis for concluding that an AMP is not needed for lubrite supports, particularly with respect to its potential property changes (e.g., bearing/shear strengths, deformability/plastic flow, coefficient of friction, etc.) and the effects of these property changes on the intended function of the steam generator supports.

FPL RESPONSE:

Lubrite is the trade name for a low friction lubricant material used in applications where relative motion (sliding) is desired. At Turkey Point, the intended function of the lubrite plates is to facilitate relative motion (sliding) during RCS heat-up and cool-down.

As described in an Engineering Brief supplied by Lubrite vendor Jackson-Wheeler Metals Services, Inc., Lubrite material resists deformation, has a low coefficient of friction, resists softening at elevated temperatures, absorbs grit and abrasive particles, is not susceptible to corrosion, withstands high intensities of radiation, and will not score or mar.

As described in additional literature on Lubrite provided by Lubrite Technologies (formerly Merriman), Lubrite products are solid, permanent, completely self lubricating, and require no maintenance for the design life of the product. The Lubrite proprietary lubricant is a custom compound mixture of metals, metal oxides, minerals, and other lubricating materials combined with a lubricating binder. The lubrite lubricants used in nuclear applications are designed for the environments to which they are exposed.

As described in LRA Subsection 3.6.1.5.3 (page 3.6-24), FPL performed an extensive search of industry and plant specific operating experience (utilizing the various sources listed in FPL response to RAI 3.6.2.4-5, including the INPO website). No reported instances of lubrite plate degradation or failure to perform their intended function were identified. Consequently, there are no known aging effects that would lead to a loss of intended function.

RAI 3.6.1.2-4:

Section 3.2.1.2 of Appendix B of the LRA states that ASME Section XI, Subsection IWE Inservice Inspection Program meets the requirements of 10 CFR 50.55(a) and ASME Section XI, Subsection IWE, for inspection of Class CC metallic liners and pressure retention components without a discussion of the program contents. Provide a discussion of any plant-specific program contents, including how the visual inspection of the internal and external surfaces and fasteners is to be implemented, thereby providing assurance that the containment shell and internal structures have not degraded due to corrosion and/or cracking. 10 CFR Part 50 endorsed ASME Section XI, Subsection IWE with the condition that 10 CFR 50.55a(b)(2)(ix) provisions are met. The FPL submittal is not clear regarding this requirement. Confirm that both the scope and the detail of the inspection implemented in accordance with ASME Section XI Table IWE-2500-1 also complies with the requirements of 10 CFR 50.55a(b)(2)(ix). In addition, NUREG 1611, "Aging Management of Nuclear Power Plant Containments for License Renewal," states that applicants for license renewal need to evaluate, on a case-by-case basis, the acceptability of inaccessible areas even though conditions in accessible areas may not indicate the presence of degradation to inaccessible areas. Describe how the aging effects for such inaccessible areas will be addressed.

FPL RESPONSE:

The Turkey Point ASME Section XI, Subsection IWE Inservice Inspection Program is discussed in LRA Appendix B, Section 3.2.1.2 (page B-30). The IWE program includes visual examination of all accessible interior and exterior surfaces of the metallic shell and penetrations, thereby providing assurance that the containment shell and internal structures have not degraded due to corrosion. Note, the aging management review for the containment liner determined that cracking is not an aging effect requiring management (see LRA Section 3.6.1.2.2, page 3.6-10).

The scope and detail of the PTN ASME Section XI, Subsection IWE Inservice Inspection Program is implemented in accordance with the requirements of ASME Section XI Table IWE-2500-1 and the requirements of 10 CFR 50.55a(b)(2)(ix).

Inaccessible areas are managed by visually examining accessible areas of in-scope structures and other relevant structures for conditions that could indicate the presence of degradation to such inaccessible areas (see response to RAI 3.6.1.1-1). The IWE program (Category E-D) requires visual examination of moisture

barriers intended to prevent intrusion of moisture against inaccessible areas of the pressure retaining liner, thereby providing assurance that the moisture barriers are not degraded.

Containment concrete components are constructed of dense, well-cured concrete consistent with the guidance provided in ACI 201.2R-77. The concrete was designed in accordance with ACI 318-63. The aggregates were tested in accordance with ASTM C295. The above groundwater concrete is not exposed to an aggressive environment. These features ensure concrete cracking is minimized. Consequently, the concrete over the containment liner plate provides adequate protection of the inaccessible portions of the liner plate. Additionally, when events occur such as borated water leaks, potential degradation of inaccessible structures is evaluated as part of the corrective action program.

RAI 3.6.1.5-1:

Table 3.6-2 lists electrical, instrument panels and enclosures, miscellaneous structural components, and miscellaneous steel (stairs, platforms, and grating) as items made of galvanized carbon steel. The boric acid wastage surveillance program is designated as the aging management program for these items; however, Section 3.6.1.5 of the LRA does not provide a detailed discussion assigning this aging management program to these items. Provide an explanation for not including the systems and structural monitoring program as an additional AMP for these galvanized carbon steel items.

FPL RESPONSE:

As discussed in LRA Appendix C, Section 5.1 (page C-15), galvanized carbon steel is not considered susceptible to general corrosion except where buried, submerged in fluid, or subject to wetting. Based on a review of Turkey Point plant operating experience, no reported cases of corrosion of galvanized structural carbon steel inside containment were identified. Since loss of material due to general corrosion of galvanized carbon steel does not occur in the containment air environment, the Systems and Structures Monitoring Program has not been credited as an additional AMP for galvanized electrical, instrument panels and enclosures, miscellaneous structural components, and miscellaneous steel addressed in LRA Table 3.6-2 (page 3.6-53).

RAI 3.6.1.5-2:

Based on the extent of the use of protective coatings at Turkey Point Units 3 and 4, provide an aging effect evaluation for the proper functioning of the sump screens, listed in Table 3.6-2 of the LRA, from the degradation of Turkey Point coatings.

FPL RESPONSE:

Although protective coatings are used extensively at Turkey Point, protective coatings (excluding galvanizing) are not credited in the determination of aging effects for the equipment or structures that are coated. Protective coatings are a design feature of the item coated, but the coatings have no effect on the intended function of the item coated. Since protective coatings do not affect intended functions, no aging management review is required for protective coatings.

As discussed in Subsection 2.4.1.1.2 (page 2.4-4) of the LRA, coatings qualified for use in the Turkey Point Units 3 and 4 Containments are adequate to resist exposures due to both normal operating and design basis accident conditions. These exposures include ionizing radiation, high temperature and pressure, impingement from jets or sprays, and abrasion due to traffic.

Generic Letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System after a Loss-Of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment," was issued to alert licensees to the problems associated with the material condition of protective coatings inside containments. The generic letter was issued to request information to evaluate plant programs for ensuring coatings inside containments do not detach from their substrate and interfere with operation of accident mitigation systems.

As described in the Turkey Point response to Generic Letter 98-04 [Reference 2.4-2 of the LRA], FPL has implemented controls for the surface preparation, procurement, application, surveillance, and maintenance activities for service level 1 coatings used inside containment. In addition, coating logs are maintained and documented in controlled calculations. The logs are reviewed and updated after each refueling outage. An assessment of the overall condition of coatings is performed prior to unit restart after each refueling outage to ensure that coatings will have no effect on operation of accident mitigation systems. In addition, the sump screens in the containment are inspected during every refueling outage to ascertain that the screens will perform their

intended function. Debris and loose objects are collected and removed prior to start-up, which ensures that the sump area is clean and that all items that could wash into the sump or block the screens have been removed.

Additionally, the sump screens will be inspected as part of the Systems and Structures Monitoring Program and the Boric Acid Wastage Surveillance Program as indicated in Table 3.6-2 (page 3.6-54).

RAI 3.6.1.5-3:

Table 3.6-2 of the LRA lists conduits and cable tray supports as items requiring aging management for the loss of material aging effect. However, self-loosening of bolted connections due to vibration is not listed as an applicable aging effect. The staff's experience is that expansion and undercut anchors in concrete may become loose due to the local degradation of the surrounding concrete from vibratory loads. Provide the technical justification for not including loss of pre-load due to the effects of vibration on the concrete surrounding expansion and undercut anchors.

FPL RESPONSE:

The FPL design specification for expansion and undercut anchors specifically prohibits use of these anchors in vibratory service conditions. In addition, structural bolting used in vibratory service is designed to preclude self-loosening (e.g., by using cotter pins).

Any degradation due to vibratory loading would occur relatively early in plant life. Such an occurrence would be detected and corrective actions implemented to preclude recurrence. Thus, vibratory effects are addressed by the design and construction of the structures and structural components subject to vibratory service conditions. Therefore, degradation due to vibration is not an aging effect requiring management.

RAI 3.6.1.5-4:

Are any elastomers, besides the sealants, gaskets, and moisture barriers listed in Table 3.6-2 of the LRA within the scope of license renewal and subject to an AMR? If so, then discuss their applicable aging effects. Since seepage through elastomers has been previously identified in other nuclear power plant structures, which is indicative of elastomer aging, provide a description of the applicable, site-specific operating experience and include any occurrences of observable seepage or leaching through concrete walls below grade. Observable seepage or leaching through concrete walls below grade is an indicator of the degradation of water stops, waterproofing membranes, caulking, and/or sealants. Describe the AMP used to manage the aging of Turkey Point elastomers.

FPL RESPONSE:

Weatherproofing for structures other than the Containments (e.g., caulking, sealants, roofing materials, chase foam, and silicone), as listed in LRA Tables 3.6-5 (page 3.6-68), 3.6-9 (page 3.6-74), 3.6-10 (page 3.6-79), and 3.6-17 (page 3.6-99), is within the scope of license renewal and subject to aging management review. Turkey Point weatherproofing materials have experienced degradation that has resulted in a loss of seal. Consequently, the aging effect requiring management is loss of seal, and the aging management program is the Periodic Surveillance and Preventive Maintenance Program.

Based on review of Turkey Point operating experience regarding below grade structural sealants, there is no record of seepage or leaching through in-scope concrete walls below grade. See FPL response to RAI 2.4.1-1 for a discussion of Turkey Point waterproofing membranes and waterstops.

The Periodic Surveillance and Preventive Maintenance Program is used to manage loss of seal for Turkey Point elastomers that require aging management. This program is described in LRA Appendix B, Section 3.2.11 (page B-67), and consists of visual inspections of specific weatherproofing features for signs of degradation that could lead to a loss of seal.

The Systems and Structures Monitoring Program is credited for managing aging of concrete walls below groundwater. This program is described in Appendix B, Section 3.2.15 of the LRA and in the FPL response to RAI 3.6.1.1-1.

RAI 3.6.1.5-5:

Table 3.6-2 and Section 3.6.2 of the LRA lists anchorages/ embedments that are located above the ground water table or in an air conditioned environment as items not requiring aging management. Provide the basis for your determination for not requiring aging management including a discussion of the potential for loss of material due to boric acid wastage for threaded fasteners in structural connections.

FPL RESPONSE:

LRA Table 3.6-2 lists two types of containment anchorages/ embedments that are located above groundwater, those encased in concrete (page 3.6-50) and those exposed to containment air (page 3.6-53).

The surrounding concrete protects the anchorages/embedments encased in concrete, thus, aging management is not required. As described in LRA Appendix B, section 3.2.3 (page B-44), the Turkey Point Boric Acid Wastage Surveillance Program (including, as a minimum, inspections inside containment each refueling outage) provides for early identification and timely corrective action. Although boric acid leaks have been identified and corrected at Turkey Point, no degradation of anchorages/ embedments encased in concrete has been observed. Boric acid leaks are evaluated on a case by case basis for potential degradation effects, including embedded items, as part of the Corrective Action Program. Therefore, there are no aging effects requiring management for anchorages/embedments encased in concrete located above groundwater.

The anchorages/embedments exposed to containment air and borated water leaks are subject to loss of material and boric acid wastage. They are managed by the System and Structures Monitoring Program and the Boric Acid Wastage Surveillance Program.

The aging management conclusions reached for the anchorages/ embedments in containment also apply to the anchorages/embedments in the other structures as indicated in LRA Tables 3.6-3 through 3.6-20. LRA Section 3.6.2.1.2 (page 3.6-29) discusses loss of material for steel in air components, which includes anchorages/ embedments exposed to air, for other structures. LRA Section 3.6.2.3.2 (page 3.6-37) discusses loss of material for steel components encased in concrete, which includes anchorages/ embedments in concrete, for other structures.

RAI 3.6.1.5-6:

Define what is meant by the term "fouling" as discussed in Section 3.2.15 of Appendix B of the LRA. Also describe how fouling is detected using an external visual inspection.

FPL RESPONSE:

Fouling is not an aging effect for the Containment internal structural steel components identified in Section 3.6.1.5 (page 3.6-20) of the LRA. Fouling applies to specific mechanical components (e.g., air cooled heat exchangers) within the scope of the Systems and Structures Monitoring Program.

RAI 3.6.1.5-7:

Describe how loss of material, as discussed in Section 3.2.15 of Appendix B of the LRA, will be detected on internal surfaces using an external visual inspection.

FPL RESPONSE:

Loss of material occurring on internal surfaces is not an applicable aging effect for the Containment structural steel components identified in LRA Section 3.6.1.5, (pages 3.6-20 and 3.6-21). Loss of material on internal surfaces applies to specific mechanical components (e.g., small-bore intake cooling water piping) within the scope of the Systems and Structures Monitoring Program where leakage inspection is credited.

RAI 3.6.2.1-1:

Table 3.6-3 of the LRA states that loss of material is an aging effect for steel anchorages/embedments under an embedded/encased environment that requires management. The systems and structures monitoring program is the aging management program provided to manage the loss of material aging effect for these steel components. Based on the information provided in Section 3.2.15 of appendix B of the LRA, the staff is uncertain how this aging effect will be managed by the structural monitoring program. Discuss the effectiveness of the systems and structures monitoring program for managing the loss of material aging effect for these normally inaccessible steel components.

FPL RESPONSE:

Table 3.6-3 (page 3.6-64) states that anchorages/embedments below groundwater elevation encased in concrete are subject to loss of material. This is due to the potential for these items to be exposed to aggressive groundwater. The Systems and Structures Monitoring Program is credited for managing aging of these structural components.

See FPL response to RAI 3.6.1.1-1 for a discussion of how below groundwater components are managed by the Systems and Structures Monitoring Program.

RAI 3.6.2.1-2:

In Section 3.6.2, for reinforced concrete components in structures other than containments, which are above groundwater elevation, you provided no aging management program. Most of the licensees use their systems and structures monitoring program to monitor these components. Please explain how these components will be monitored for aging effects at Turkey Point.

FPL RESPONSE:

10 CFR 54.21(a)(3) requires that the effects of aging are adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation. Thus, aging effects that could cause a loss of intended function require aging management. The analysis of possible aging effects for reinforced concrete components in structures other than containment is summarized in LRA Section 3.6.2.3 (page 3.6-36). The analysis is based on concrete material properties, the applicable environments, and years of operating experience. Although the Turkey Point operating experience does include several concrete aging effects, such as the items documented in Appendix A of NUREG-1522 (scaling of the Unit 3 containment dome and discoloration of the Unit 3 spent fuel building ceiling), these aging effects were evaluated in accordance with the Corrective Action Program, as appropriate, and determined to be insignificant with no impact on intended functions. The analysis concludes that there are no aging effects that could cause a loss of intended function for reinforced concrete components above groundwater. Therefore, no aging management programs are required for these components.

These concrete structures are inspected as part of existing Maintenance Rule structural inspections required by 10 CFR 50.65. These inspections have also confirmed that there are no aging effects requiring management for above groundwater concrete structures.

However, based on discussions with the NRC Staff, FPL proposes to modify the ASME Section XI, Subsection IWL Inservice Inspection Program, described in LRA Appendix B, Subsection 3.2.1.4 (page B-37), to manage aging of Containment reinforced concrete above groundwater. These detailed inspections would serve as an indicator of potential aging for above groundwater reinforced concrete components in structures other than the Containments.

RAI 3.6.2.1-3:

Galvanized carbon steel components exposed to indoor air environment (e.g., miscellaneous structural components, stair and platforms in Table 3,6-2; cable trays/conduits and HVAC duct supports in Table 3.6-3) are listed as items having no aging effect requiring aging management. Past staff review experience of other license renewal applications indicate that galvanized steel exposed to wetted inside containment/indoor environment can experience loss of material due to crevice corrosion (via collection of moisture at crevices). Discuss the basis for your conclusion that crevice corrosion of galvanized steel exposed to wetted conditions does not apply to Turkey Point Plant.

FPL RESPONSE:

Galvanized structural components located inside containment or other indoor air environments are generally not exposed to a wetted environment. In addition, galvanized structural components are often seal welded. However, loss of material is an aging effect requiring management for carbon steel - galvanized exposed to a wetted environment, including borated water leaks. Accordingly, galvanized components in these environments are identified in the LRA Tables 3.6-2 through 3.6-20 (pages 3.6-50 through 3.6-107). The programs credited for aging management of galvanized carbon steel are the Boric Acid Wastage Surveillance Program for borated water leaks environments and the Systems and Structures Monitoring Program for wetted environments.

RAI 3.6.2.3-1:

Section 3.6.2.3 of the LRA states that cracking due to shrinkage and settlement of unreinforced masonry block walls is an aging effect requiring management for concrete structural components. However, the credited aging management program, systems and structures monitoring program, does not appear to provide adequate coverage for this aging effect. Provide a more detailed description of the inspection procedures used by the systems and structures monitoring program for monitoring the condition of masonry block walls.

FPL RESPONSE:

Masonry block walls are used throughout the plant in various buildings (see Tables 3.6-2 through 3.6-20 of the LRA). Design information for the masonry block walls is maintained on site. As described in Section 3.6.2.3.2 (page 3.6-39), shrinkage and settlement of support structures can cause cracking of unreinforced masonry blockwalls and an aging management program is required. As indicated in Tables 3.6-2 through 3.6-20 (pages 3.6-50 through 3.6-107) of the LRA, the Systems and Structures Monitoring Program (SSMP) is credited for managing the aging effect "cracking" for unreinforced blockwalls within the scope of license renewal.

The SSMP inspection procedures require visual inspection of masonry walls for signs of degradation, including cracks, missing or degraded mortar, missing or damaged masonry units, and degradation at bracing connections. When cracks are identified, they are evaluated under the Corrective Action Program to ensure the extent of cracking does not invalidate the evaluation basis established either in response to IEB 80-11 (reference Safety Evaluation and Technical Evaluation Report transmitted via NRC letter from S.A. Varga to J.W. Williams dated January 4, 1985) or established for implementation of USI A-46 (reference Safety Evaluation transmitted via NRC letter from R. P. Croteau to J. H. Goldberg, dated February 9, 1995).

RAI 3.6.2.3-2:

Clarify whether the Turkey Point containments have a porous concrete sub-foundation? If so, explain how the reduction in foundation strength from the erosion of porous concrete sub-foundation was considered.

FPL RESPONSE:

The Turkey Point containments do not have a porous concrete sub-foundation.

RAI 3.6.2.4-1:

Section 3.6.2.4.2 of the LRA states that fire penetration seals are not subjected to aging effects. However, as part of the plant fire protection program, which is mandated by Appendix R of 10 CFR Part 50 and Branch Technical position (BTP) 9.5-1, the fire barrier inspection program requires periodic visual inspection of fire barrier penetration seals for signs of seal degradation due to increased hardness or shrinkage leading to cracking, separation from walls or components, separation of layers of material, and rupture or puncture of seals. Discuss how these aging effects are managed and clarify if the fire penetration seals are included within the scope of the existing fire protection program.

FPL RESPONSE:

As indicated in the RAI, Appendix R of 10 CFR 50 and Appendix A to Branch Technical Position (BTP) 9.5-1 require visual inspection of fire barrier penetrations. These inspections are performed at Turkey Point in accordance with regulatory requirements as part of the existing fire protection program. No indications of fire penetration seal aging effects have been identified by these inspections.

Some industry analysts have postulated loss of material, change in material properties, and cracking as potential aging effects requiring management for fire barrier penetration seals. However, based on information provided in SECY-96-146 and Turkey Point plant operating experience, these theoretical aging effects are not applicable at Turkey Point.

Excerpt from SECY-96-146:

5.10 Aging and Shrinkage

"In its letter report entitled "Aging of Fire Barriers in Nuclear Power Plants," September 30, 1994, SNL reported that many fire barrier materials are resistant to thermally accelerated aging and that the material properties of silicone-based materials, which dominate the industry, are particularly age independent. SNL concluded that these materials are not expected to exhibit problems as they age. Moreover, on the basis of its review of operating experience and the technical literature, SNL did not find any penetration seal problems that were directly related to aging. SNL reported that it did not find information on thermal aging or radiation testing of grout, cement, and

gel-type seals. SNL did not recommend an experimental aging program. . . ."

Based on the above finding and plant operating experience, fire barrier penetration seals do not experience aging effects that would lead to a loss of intended function.

RAI 3.6.2.4-2:

Section 3.6.2.4.2 of the LRA states, "Should indication of an aging effect arise in the control room ceiling and raised floor areas, it would be identified and corrected." However, Table 3.6-5 does not identify any aging effect or aging management program for control room ceiling and control room raised floor. Discuss and resolve this inconsistency, and identify appropriate aging management programs.

FPL RESPONSE:

Based on years of operating experience, no aging effects requiring management for the raised floor and suspended ceiling have been identified at Turkey Point. The Control Room is an indoor air conditioned controlled atmosphere that inhibits aging effects. Thus, there are no aging effects requiring management for these components. Consequently, no aging management program is required.

RAI 3.6.2.4-3:

Section 3.6.2.4.2 of the LRA states that aluminum stop logs and pipe trench penetrations, which provide flood protection for the intake structure, have been evaluated for loss of material and determined not to require aging management. Provide details of the evaluation performed for loss of material and the basis for concluding that no aging management program is required.

FPL RESPONSE:

For clarification, there are no aluminum stop logs or pipe trench penetrations at the intake structure. Aluminum stop logs and pipe trench seals are provided for the Auxiliary Building (Table 3.6-3, page 3.6-64) and the Turbine Building (Table 3.6-17, page 3.6-100).

As stated in LRA Section 3.6.2.4.2 (page 3.6-44), aluminum is highly resistant to corrosion. Consequently, there are no aging effects that would cause a loss of intended function for aluminum stop logs.

As indicated in Table 3.6-3 (page 3.6-64), pipe trench seals are Promatec flexible seals, subject to loss of seal, and managed by the Periodic Surveillance and Preventive Maintenance Program, as described in LRA Appendix B, Section 3.2.11 (page B-67). Because the function of the seal is to provide a flood protection barrier, loss of seal is the aging effect requiring management, as opposed to loss of material.

RAI 3.6.2.4-4:

Section 3.6.2.4.2 of the LRA states that the wooden and aluminum stop logs, which provide flood protection for the intake structure, have been evaluated for loss of seal and determined not to require aging management. Provide details of the evaluation performed for loss of seal and the basis for concluding that no aging management program is required.

FPL RESPONSE:

For clarification, there are no wooden or aluminum stop logs at the intake structure. Wooden and aluminum stop logs are provided for the Auxiliary Building (Table 3.6-3, page 3.6-64) and the Turbine Building (Table 3.6-17, page 3.6-100).

The purpose of the wooden and aluminum stop logs is to provide a flood protection barrier against wave run-up. The stop logs are not intended to be leak tight barriers. Therefore, the aging effect, loss of seal, is not an aging effect that would cause a loss of intended function, and therefore, is not an aging effect requiring management.

RAI 3.6.2.4-5:

Section 3.6.2.4.3 of the LRA states that a review of industry operating history and a review of NRC generic communications were performed to validate the set of aging effects that require management. The LRA provides a list of NRC generic communication; however, the references that were reviewed for industry operating history and experience are not identified. Clarify whether your review includes pertinent industry operating experience reports from other Westinghouse owner's group-member utilities and identify the references that were reviewed.

FPL RESPONSE:

The document listing provided in LRA Section 3.6.2.4, (pages 3.6-45 and 3.6-46) was not meant to be an all-inclusive listing. The industry history review included pertinent industry operating experience reports and documents from: the Westinghouse Owners Group, EPRI, NEI, the NRC website, industry websites, as well as conversations with other utility personnel, manufacturing firms, and industry experts. In addition to those documents listed in LRA Section 3.6.2.4, other documents reviewed include:

EPRI, TR-103158, Calvert Cliffs Nuclear Power Plant Life Cycle Management/License Renewal Program System, Structure and Component Screening

Calvert Cliffs License Renewal Application

Oconee License Renewal Application

Plant Hatch License Renewal Application

Arkansas Nuclear One License Renewal Application

NEI 95-10, Industry Guideline for Implementing the Requirements of 10 CFR Part 54-The License Renewal Rule

Safety Evaluation Report related to the license renewal of Oconee Nuclear Station Units 1, 2 and 3.

Safety Evaluation Report related to the license renewal of Calvert Cliffs Nuclear Units 1 and 2

WCAP-14422, License Renewal Evaluation: Aging Management for Reactor Coolant System Supports

WCAP-14756, Aging Management Evaluation for Pressurized Water Reactor Containment Structure

Pressurized Water Reactor Containment Structures, License Renewal Industry Report, Revision 1, NUMARC Report 90-01, EPRI TR-103835 (NUMARC is a now the Nuclear Energy Institute)

Class 1 Structures License Renewal Industry Report, Revision 1, NUMARC Report 90-06, ERPI TR-103842