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SUBJECT: Responds to GL 98-04, "Potential for Degradation of ECCS & Containment Spray System after LOCA because of Construction & Protective Coating Deficiencies & Foreign Matl in Containment."

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L-98-272
10 CFR 50.4
10 CFR 50.54(f)

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

RE: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to 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"

On July 14, 1998, the NRC issued Generic Letter (GL) 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." GL 98-04 requires licensees to submit a written response, within 120 days of the date of the GL, that includes the required information to evaluate licensees' programs for ensuring that Service Level 1 protective coatings inside containment do not detach from their substrate during a design basis Loss-Of-Coolant Accident (LOCA) and interfere with the operation of the Emergency Core Cooling System (ECCS) and the safety-related Containment Spray System (CSS).

In accordance with the NRC request, attached is FPL's response to GL 98-04, for Turkey Point Units 3 and 4. This response is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Should there be any questions, please contact us.

Very truly yours,

R. J. Hovey
Vice President
Turkey Point Plant

GSS

Attachment

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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P PDR

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
L-98-272

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 Plant, 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.

RJH
R. J. Hovey

Subscribed and sworn to before me by R. J. Hovey who is personally known to me on this

9th day of Nov, 1998.

Cheryl A. Stevenson

Name of Notary Public (Type or Print)



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Turkey Point Units 3 and 4
Response to NRC Generic Letter 98-04

The NRC has issued Generic Letter (GL) 98-04 to alert addressees that foreign material continues to be found inside operating nuclear power plant containments. During a design basis (DB) Loss-of-Coolant Accident (LOCA), this foreign material could block an Emergency Core Cooling System (ECCS) or safety-related Containment Spray System (CSS) flow path or damage ECCS or safety-related CSS equipment. The NRC expects addressees to ensure that the ECCS and the safety-related CSS remain capable of performing their intended safety functions. Therefore, no action or information is requested by GL 98-04 regarding this issue.

The NRC has also issued this GL to alert the addressees to the problems associated with the material condition of Service Level 1 protective coatings inside the containment, and to request information under 10 CFR 50.54 (f) to evaluate the addressees' programs for ensuring that Service Level 1 protective coatings inside containment do not detach from their substrate during a DB LOCA and interfere with the operation of the ECCS and the safety-related CSS.

GL 98-04 is addressing issues which have generic implications regarding the impact of potential coating debris on the operation of safety related systems, structures, and components during and after a postulated DB LOCA. Detachment of the protective coatings from the substrate may make the emergency core cooling system unable to satisfy the requirement of 10 CFR 50.46(b)(5) to provide long-term cooling. Such detachment of coatings may also make the safety related containment spray system unable to satisfy the plant-specific licensing basis for controlling containment pressure and radioactivity releases following a LOCA.

Florida Power and Light Company's (FPL's) response to the information required by GL 98-04, for Turkey Point Units 3 and 4, is provided below:

NRC GL 98-04 Item (1)

"A summary description of the plant-specific program or programs implemented to ensure that Service Level 1 protective coatings used inside the containment are procured, applied, and maintained in compliance with applicable regulatory requirements and the plant-specific licensing basis for the facility. Include a discussion of how the plant-specific program meets the applicable criteria of 10 CFR Part 50, Appendix B, as well as information regarding any applicable standards, plant-specific procedures, or other guidance used for:

(a) controlling the procurement of coatings and paints used at the facility, (b) the qualification testing of protective coatings, and (c) surface preparation, application, surveillance, and maintenance activities for protective coatings. Maintenance activities involve reworking degraded coatings, removing degraded coatings to sound coatings, correctly preparing the surfaces, applying new coatings, and verifying the quality of the coatings."

FPL Response:

FPL has conducted a review of existing programs related to the information requested by GL 98-04. The following is the summary description of the Service Level 1 protective coatings program used inside the containment, for Turkey Point Units 3 and 4.

FPL has implemented controls for the surface preparation, procurement, application, surveillance and maintenance activities for Service Level 1 protective coatings used inside the containment in a manner that is consistent with the licensing basis and regulatory requirements applicable to Turkey Point Units 3 and 4. The requirements of 10 CFR Part 50 Appendix B are implemented through specification of appropriate technical and quality requirements for the Service Level 1 coating program which is considered a "Special Process" and controlled in accordance with ANSI N45.2 requirements. This program addresses both new coatings and ongoing maintenance activities.

The original coating systems installed in the containment were tested to ensure that the physical characteristics of the material used are adequate to resist exposure due to both normal operating and maximum hypothetical accidental (MHA) conditions during the life of the units. Exposures include ionizing radiation, high temperature and pressure, air-steam atmosphere, impingement from jets or sprays, and abrasion due to traffic. The coating systems were also tested to ensure that the chemical characteristics of the material used are resistant to the containment atmosphere and to substances used for decontamination and chemical spray following an MHA.

FPL's Service Level 1 coating specification SPEC-C-034, "Protective Coatings for Service Level 1 Applications Inside the Reactor Containment Building," provides the technical requirements for protective coating work to be performed inside the Turkey Point Units 3 and 4 containment buildings. The coating specification provides necessary technical information and controls to assure that new coatings are of a high quality, reliable, meet applicable regulatory requirements, qualified to prevent transport of paint debris to the ECCS sump under post-LOCA conditions, provide corrosion control and provide a suitable surface which will facilitate radioactive decontamination. The specification covers the procurement, storage, removal of existing coating, surface preparation, application,

inspection, applicator's certification, quality assurance documentation, condition assessment, and other related coating activities. The codes and standards used to develop the current specification are ANSI N101.2, ANSI N101.4, ANSI N45.2, ANSI N45.2.2, ANSI N45.2.6 and 10 CFR 50 Appendix B. Adequate assurance that the applicable requirements for procurement, application, inspection, and maintenance are implemented is provided by procedures and programmatic controls, approved under the FPL Quality Assurance (QA) program.

Following are the highlights of current Service Level 1 coating controls at Turkey Point Units 3 and 4.

- Procurement of Service Level 1 Coating Material:

The Service Level 1 coating specification identifies specific coating systems which are approved for use inside the Turkey Point Unit 3 and 4 containment buildings. These systems have been laboratory tested to withstand the MHA conditions. Service Level 1 coatings used for new applications or repair/replacement activities are specified for nuclear grade applications. Service Level 1 coatings are procured from vendors with QA program meeting the applicable requirements of 10 CFR 50 Appendix B. The applicable technical and quality requirements that the vendor is required to meet are specified by FPL in procurement documents. Acceptance activities are conducted in accordance with procedures that are consistent with ANSI N45.2 and ANSI N45.2.2 requirements, e.g., receipt inspection, source surveillance. The specification of required technical and quality requirements combined with appropriate receipt inspection and acceptance activities, provides adequate assurance that the coatings received meet the requirements of the procurement documents.

- Qualification Testing of Coating:

The Service Level 1 coating systems used for new applications or repair/replacement activities have been tested under conditions which envelop the MHA conditions postulated for Turkey Point Units 3 and 4.

These tests were performed for Turkey Point Units 3 and 4 site specific conditions following the guidelines of ANSI N101.2. The test results demonstrate that the current Service Level 1 coating systems will remain intact during the MHA conditions postulated for Turkey Point Units 3 and 4. A very limited amount of coatings inside containment do not meet the design basis requirements and are classified as unqualified coatings. In accordance with the requirements of the Service Level 1 coating specification, logs of unqualified coatings in each unit are maintained and documented in controlled calculations. The logs are reviewed prior to startup to ensure that unqualified coatings are bounded by the acceptable limit, and are updated after each refueling outage. The acceptable amount of unqualified coatings is based on consideration of containment

recirculation flow characteristics, debris transport analysis, and sump blockage considerations. A continuing effort to eliminate the amount of unqualified coatings to the extent practicable is an objective of the program.

- Surface Preparation, Application, Surveillance, and Maintenance Activities:

Surface preparation, application, inspection, surveillance, maintenance activities, and documentation associated with Service Level 1 coatings at Turkey Point Units 3 and 4 are performed in accordance with detailed instructions provided in the Service Level 1 coating specification. This specification meets the intent of ANSI N101.2, ANSI N101.4, ANSI N45.2, ANSI N45.2.2, ANSI N45.2.6, and 10 CFR 50 Appendix B. Service Level 1 coating work performed by FPL is in accordance with the requirements of the FPL's QA program. Service Level 1 coating work performed by contract personnel is performed either in accordance with the requirements of the FPL's QA program, or the contractor QA program which has been approved by the FPL Quality Assurance department.

FPL periodically conducts visual inspections and condition assessments of Service Level 1 coatings inside the Turkey Point Unit 3 and 4 containment buildings. These inspections are part of the containment closeout inspections performed at the end of a refueling outage, and the conduct of the inspection is addressed within the Service Level 1 coating specification. Inspection results are documented and evaluated prior to unit start-up. As localized areas of degraded coatings are identified, a list is prepared to schedule and prioritize repair/replacement activities as necessary for future refueling outages. The inspection/assessment program provides long term material condition data that is used for future maintenance planning.

NRC GL 98-04 Item (2)

"Information demonstrating compliance with item (i) or item (ii):

- (i) For plants with licensing-basis requirements for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related SSCs during a postulated DB LOCA, the following information shall be provided to demonstrate compliance:
 - (a) The date and findings of the last assessment of coatings, and the planned date of the next assessment of coatings.
 - (b) The limit for the amount of unqualified protective coatings allowed in the containment and how this limit is determined.

Discuss any conservatism in the method used to determine this limit.

- (c) If a commercial-grade dedication program is being used at your facility for dedicating commercial-grade coatings for Service Level 1 applications inside the containment, discuss how the program adequately qualifies such a coating for Service Level 1 service. Identify which standards or other guidance are currently being used to dedicate containment coatings at your facility; or,
- (ii) For plants without the above licensing-basis requirements, information shall be provided to demonstrate compliance with the requirements of 10 CFR 50.46b(5), "Long-term cooling" and the functional capability of the safety-related CSS as set forth in your licensing basis. If a licensee can demonstrate this compliance without quantifying the amount of unqualified coatings, this is acceptable. The following information shall be provided:
 - (a) If commercial-grade coatings are being used at your facility for Service Level 1 applications, and such coatings are not dedicated or controlled under your Appendix B Quality Assurance Program, provide the regulatory and safety basis for not controlling these coatings in accordance with such a program. Additionally, explain why the facility's licensing basis does not require such a program."

FPL Response:

Turkey Point Units 3 and 4 do not have licensing-basis requirements for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related structures, systems, and components (SSCs) during a postulated design basis LOCA. Therefore, only Item (2)(ii) is applicable.

FPL does not currently utilize commercial grade dedication for Service Level 1 coatings inside containment at Turkey Point Units 3 and 4. Therefore, Item (2)(ii)(a) is not applicable. Service Level 1 coatings are procured Safety Related from vendors who maintain a 10 CFR 50 Appendix B QA program.

The following description from the Updated Final Safety Analysis Report (UFSAR)* provides the licensing basis for Turkey Point Units 3 and 4 relative to conformance with 10 CFR 50.46(b)(5), "Long-term cooling." Specifically, with regard to Turkey Point's ability to provide extended decay heat removal for debris that could block containment emergency sump screens, UFSAR Section 6.2.2 states:

Recirculation Phase

After the injection operation, coolant spilled from the break and water collected from the containment spray is cooled and returned to the Reactor Coolant System by the recirculation system.

Those portions of the Safety Injection System located outside of the containment which are designed to circulate, under post-accident conditions, radioactively contaminated water collected in the containment, meet the following requirements:

- a) Shielding to maintain radiation levels within the guidelines set forth in 10CFR100.
- b) Collection of discharges from pressure relieving devices into closed systems.
- c) Means to limit radioactivity leakage to the environs, within guidelines set forth in 10CFR100.

When the break is large, depressurization occurs due to the large rate of mass and energy loss through the break to containment. The system is arranged so that the residual heat removal pumps take suction from the sump in the containment floor and deliver spilled reactor coolant and borated refueling water back to the core through the residual heat exchangers. The system is arranged to allow either of the residual heat removal pumps to take over the recirculation function. Only one pump is required to handle the total recirculation flow after the MHA.

There are two sump return lines which lead from the containment to the residual heat removal pumps. The arrangement of recirculation equipment is shown on Figures 6.2-1 and 6.2-5. (Note: These UFSAR Figures are not provided with this response.)

Filtration of the water entering the residual heat removal pump suction piping is accomplished by screens located over the sumps. The 1/4" mesh screen, with a diagonal dimension less than 3/8", provides filtration of rigid particles 3/8" and larger to prevent clogging of the containment spray nozzle 3/8" openings.

Two sumps, each with a 14" diameter outlet, are provided at the 14'-0" elevation. In the unlikely event that one sump is 100% clogged and the other sump is 50% clogged, there is sufficient available NPSH for the pumps such that the required recirculation flow can still be maintained.

Recirculation may start with a water depth of 2.93 feet on the containment floor at elevation 14'-0". This is equivalent to 249,000 gallons of water at 283°F. The maximum velocity of approach to the screens is less than 1/2 ft/sec.

As described in the UFSAR, Turkey Point Units 3 and 4 have assumed that the system that draws from the sumps for emergency core cooling and containment spray will accommodate complete blockage of one of the two redundant containment sumps and blockage of up to 50% of the remaining sump area from debris generated as a result of a LOCA. At the time Turkey Point Units 3 and 4 were licensed no distinction was drawn between the various potential sources for post-LOCA debris. These systems were intended to function even with debris partially obstructing the sumps from whatever source derived. The analyses, developed as part of the licensing basis for Turkey Point demonstrate that, even with this blockage, the emergency core cooling and containment spray systems will continue to provide sufficient cooling flow to fulfill the long-term cooling functions required to conform with 10 CFR 50.46(b) (5).

The NRC accepted these analyses and these systems as meeting the requirements of 10 CFR 50.46(b) in their Safety Evaluation Report (SER) dated June 5, 1975. This SER documented NRC's review of FPL's submittals with respect to the promulgation of 10 CFR 50.46 and 10 CFR 50 Appendix K, however, no specific reference is made in the SER related to compliance with 10 CFR 50.46(b) (5).

The licensing basis for Turkey Point Units 3 and 4, as accepted by the NRC's SER, provides both the regulatory and safety basis for safety system performance. Coatings are not treated separately in the licensing basis for Turkey Point because the sump screen blockage assumption does not distinguish among the source terms for the LOCA-generated debris. The analysis of coating debris transport during a LOCA and testing conducted to date does not contradict Turkey Point Units 3 and 4 determination that ECCS flow following a LOCA will be adequate to maintain the core temperature at an acceptably low value and to remove decay heat for the extended period of time required by the long-lived radioactivity remaining in the core following a design-basis accident. Accordingly, a separate demonstration of the regulatory and safety basis for safety system performance is not required.

To minimize the potential of debris clogging on the sump screens and to maintain the integrity of the sump screens, the following programs are in place at Turkey Point Units 3 and 4.

- Sump Inspection Program:

The sump screens in the containment are inspected during every refueling outage to ascertain that the screens will perform their intended function. This is done by inspecting the sump screens for the following.

- General condition (structural integrity; screen corrosion; missing or incorrectly sized screens; unintended openings in screens; damaged, loose, or missing subcomponents).
- Maintenance of design configuration.
- Debris in the vicinity of the screens.

- Containment Closeout Inspections for Foreign Material:

The containment is thoroughly inspected for debris and loose objects during each refueling outage prior to start-up. Debris and loose objects are collected and removed from containment prior to start-up as part of plant procedures. This ensures that the containment sump area is clean, and that all items that could wash into the sump or block the screens have been removed.

- Unqualified Coating Control:

In accordance with the requirements of the Service Level 1 coating specification, logs of unqualified coatings in each unit are maintained and documented in controlled calculations. The logs, including any items identified, are reviewed prior to startup as part of the closeout assessment, and are updated after each refueling outage. The acceptable amount of unqualified coatings is based on consideration of containment recirculation flow characteristics, debris transport analysis, and sump blockage considerations, and is documented in controlled calculations. In addition, an assessment is performed of the overall condition of coatings prior to restart to ensure that they would not adversely affect the ECCS or other safety related systems during an MHA.

