UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-250/85-23 and 50-251/85-23

Licensee: Florida Power and Light Company
9250 West Flagler Street
Miami, FL 33102

Docket Nos.: 50-250 and 50-251 License Nos.: DPR-31 and DPR-41

Facility Name: Turkey Point 3 and 4

Inspection at Turkey Point site near Homestead, Florida

Inspection Dates: May 15 - June 5, 1985

Inspectors: _____ 14 Aug 85
T. A. Peebles, Senior Resident Inspector Date Signed

_____ 14 Aug 85
D. R. Brewer, Resident Inspector Date Signed

Approved by: _____ 14 Aug 85
Stephen A. Elrod, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This special, unannounced inspection entailed 30 inspection hours on site, in the area of independent inspection. Also, an enforcement conference was held on June 4, 1985.

Results: In the one area inspected, one violation was identified - failure to perform a 10 CFR 50.59 unreviewed safety question review prior to modifications to a system, paragraph 4.

REPORT DETAILS

1. Licensee Employees Contacted

C. M. Wethy, Vice President - Turkey Point Nuclear Plant
C. J. Baker, Plant Manager - Nuclear
D. D. Grandage, Operations Superintendent - Nuclear
T. A. Finn, Operations Supervisor
K. L. Jones, Technical Department Supervisor
D. J. Tomaszewski, Plant Engineering Supervisor
D. A. Chaney, Corporate Licensing Supervisor
J. Arias, Regulation and Compliance Supervisor
R. L. Teuteberg, Regulation and Compliance Engineer
R. Hart, Regulation and Compliance Engineer
J. W. Kappes, Maintenance Superintendent - Nuclear
R. E. Garrett, Plant Security Supervisor
P. W. Hughes, Health Physics Supervisor
J. M. Donis, Site Engineering Supervisor
M. J. Crisler, Quality Control Supervisor
D. W. Hasse, Safety Engineering Group Chairman

Other licensee employees contacted included engineers, technicians and document control personnel.

2. Exit Interview

Exit meetings were held on May 17 and 28 1985, with the Plant Manager. The areas requiring management attention were reviewed. Previously Unresolved Item (250, 251/85-13-09), concerning the failure to perform a review per 10 CFR 50.59 prior to modifying system operation as described in the aggregate safety analysis report (SAR), was addressed in Inspection Reports 250, 251/85-13 and has been elevated in this report to Violation (250, 251/85-23-01). The example of failure to review a modification to system operation is identified in paragraph 4 with other examples of inadequate review.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Enforcement Conference

An enforcement conference was held with the persons listed below in attendance on June 4, 1985, in the Region II office. The topic was the events surrounding the operation of spent fuel pit (SFP) systems differently than assumed in the aggregate SAR.

Licensee Personnel

C. O. Woody, Vice President - Nuclear Operations
C. M. Wethy, Vice President - Turkey Point Nuclear Plant
C. J. Baker, Plant Manager - Nuclear
K. L. Jones, Technical Department Supervisor
D. J. Tomaszewski, Plant Engineering Supervisor
D. A. Chaney, Corporate Licensing Supervisor

NRC Personnel

J. N. Grace, Regional Administrator
R. D. Walker, Director, Division Reactor Projects (DRP)
P. R. Bemis, Director, Division Reactor Safety
G. R. Jenkins, Director, Enforcement and Investigations Coordination Staff
V. L. Brownlee, Branch Chief, DRP
S. A. Elrod, Section Chief, DRP
D. G. McDonald, Licensing Project Manager, ORB 1, NRR
T. A. Peebles, Senior Resident Inspector
L. Trocine, Enforcement Specialist
L. P. Modenos, Enforcement Specialist

The licensee acknowledged that the SFP cooling valve lineup was different from that stated in the FSAR and presented a discussion of the affected systems and the events that led to the initial opening of the V-797 drain valve. These events included pump failures due to cavitation. It was stated that the SFPs were first used around 1974 to store fuel and the lineup was changed in 1975.

The safety significance of the involved systems and the recently completed analysis for time of drain down (1 to 3½ hours) and indications that might be available were presented. The licensee did not believe that operating with the SFP cooling aligned to the low suction was an unreviewed safety question.

The meeting concluded with discussions which were beneficial to the understanding of the event and the licensee's corrective actions.

4. Independent Inspection (92706)

During the report period, the inspectors routinely attended meetings with licensee management and monitored shift turnovers between shift supervisors (Plant Supervisor-Nuclear [PSN]), shift foremen (Nuclear Watch Engineers [NWE]) and licensed control room operators (CRO). These meetings provided a daily status of plant operating and testing activities in progress as well as a discussion of significant problems or incidents. Based on these discussions, the inspectors reviewed potential problem areas to independently assess: their importance to safety; the proposed solutions; improvement and progress; and adequacy of corrective actions. The inspector's reviews of these matters were not restricted to the defined inspection program. Independent inspection efforts for this report were conducted in

the area of SFP operations, including: SFP leakage detection system status; SFP modifications during the SFP reracks in 1976 to 1978 per design changes (PCM 76-17A and 76-17B); procedural change review and justification of SFP system alignment from the initial procedure written in 1971; and the design change to add the anti-vortexing tee to the upper suction of the SFP cooling pump in 1984 (PCM 82-179).

In inspection reports which covered the May and November 1984 periods, 250, 251/84-18 and 250/84-35, 251/84-36 respectively, the inspectors addressed several aspects of the operation of SFP systems that did not correspond to that described in the aggregate SAR. Further review of the modification of these systems showed that the licensee had not performed a review for unreviewed safety question determination prior to the modification of some of the systems from that described in the SAR. The facility operating licenses permit the modification of systems only after a review has been conducted in accordance with 10 CFR 50.59. Several of these reviews for unreviewed safety question determination had yet to be made on May 17, 1985, when the licensee was formally notified during the exit held that day that SFP systems were being operated differently than the assumptions of the SAR, that no review per 10 CFR 50.59 had been performed and that these items constitute a violation. The Region II Project Section Chief and the Senior Resident Inspector on May 29, 1985, related to the Site Vice President that the Unit 4 SFP cooling system was still being operated differently than described in the SAR and that prompt action to assure that the system was operated within the Final Safety Analysis Report (FSAR) was required. The licensee was informed on May 29, 1985, that an enforcement conference was to be held in Atlanta on June 4, 1985, on the SFP subjects and that this special report would be written to address the potential Violation (250, 251/85-23-01). These examples of failure to perform a 10 CFR 50.59 review had been previously identified in Inspection Reports 250, 251/85-13 as an Unresolved Item (URI 250, 251/85-13-09).

The following example had specifically not been reviewed by the licensee prior to modification of system operation: FSAR sections 9.3 and 14E state that the location of the SFP pump suction line would prevent the draining of the SFP if a rupture would occur in the non-seismic suction piping of the SFP cooling loop. FSAR page 9.3-16 states, that if the SFP cooling loop were drained, that the pit itself could not be drained since the SFP cooling connections enter near the top of the pit.

FSAR Section 9.3.3, page 9.3-18, states: "The most serious failure of this loop is complete loss-of-water in the storage pit when fuel is in the pit. To protect against this possibility, the cooling pump suction connection penetrates the pit wall and terminates near the normal water level so that a break in the pipe will not gravity drain the pit. The pit drain piping penetrates the pit wall at an elevation 6 feet above the top of the fuel assemblies. Complete siphon draining of the pit by a break in this line is prevented by a normally closed valve (* - 797, ed.) located near the pit wall at the same elevation as the penetration. A break in this line upstream of this valve will only drain the pool to an elevation 6 feet above the fuel assemblies."

However, the pit drain piping has been operated as the SFP cooling system suction line since 1975 on Unit 3 and 1976 on Unit 4. The normal lineup was with the drain valve (* - 797) open and the higher cooling pump suction valve (* - 796) closed. This lower suction path does not have a siphon break without the upper suction valve (* - 796) open and extends to within six inches of the bottom of the SFP. The (SFP) cooling loop piping was operated in the normally-open position such that a malfunction could have completely drained the SFP. This is an increase in the consequences of a malfunction of equipment important to safety.

The SAR states that the possibility of siphon draining of the SFP by a break in this pit drain piping is prevented by this normally-closed valve located six feet above the fuel assemblies. The SAR evaluated the possibility of breaks upstream of this normally-closed valve but did not evaluate other malfunctions of equipment downstream of the valve. Operator error/inattention or equipment malfunction such as a pump casing failure could completely drain the SFP with this lineup, because a flowpath then existed. This plant change created the possibility for a malfunction of equipment of a different type than any evaluated previously.

Thus this plant change was an unreviewed safety question because: it increased the consequences of malfunction of equipment important to safety; and it created the possibility for a malfunction of a different type than any evaluated previously.

Additionally, the following opportunities existed to identify the system modifications and to accomplish a proper 10 CFR 50.59 review.

The SFP safety analysis was amended in January of 1976 and in March of 1984 for reracking the SFP, and the reviews should have addressed the modified system.

An anti-vortexing tee was added by a design change (PCM 82-179) to the Unit 3 SFP cooling pump upper suction inlet during the SFP rerack which was completed in March of 1985. The changeover from the lower suction to the upper suction on Unit 3 did not occur until May 2, 1985, even though the anti-vortexing design change was completed a month earlier. The review for this procedure change should have identified that Unit 4 was still operating outside of the SAR.

The NRC exit on May 17, 1985, identified that Unit 4 was operating outside of the SAR and the changeover did not occur until May 29, 1985.

Other examples of inadequate SAR review are:

a. FSAR sections 9.5, 11.2 and 14E state design parameters for SFP normal operating conditions; however, the operation of several portions of these systems was not in agreement with the stated analysis or design and no adequate 10 CFR 50.59 review could be found. Operation of the systems in the following manner has caused high temperatures in the SFP and has actually caused heavy fog in the SFP building a month after defueling.

The SFP cooling pump suction has been aligned via the alternate four inch diameter drain path instead of the eight inch upper suction, and this caused the SFP pump flow to be greatly reduced.

The lower drain suction was placed in service when SFP cooling pumps were damaged during operation in 1975. The lower drain suction was placed in service on Unit 4 in 1976. The cavitation of the SFP pumps appeared to have been caused by inducing air into the suction which appears to have been caused by operating the SFP water level below nominal. Testing for cavitation of the pumps in June of 1976 showed no sign of cavitation when the water level was near nominal and the pumps were run at design flow.

The Component Cooling Water (CCW) side of the SFP heat exchanger has been throttled to 2100 gallons per minute flow instead of 2800 gpm as designed.

The operating areas are supposedly adequately ventilated, but this is not evident to personnel working in the area.

b. FSAR sections 9.3, 9.5 and 11.2 state that temperature, level and radiation indicators in the control room will be monitored to warn of malfunctions; however, the level floats have stuck in the normal level position causing the level alarm in the control room to be inoperable. The temperature alarms were set such that, with the higher than normal temperatures caused by operating the systems as described above, they were continually alarming and provided no meaningful indication, and radiation detectors have required large amounts of maintenance and are not reliable.

c. FSAR sections 9.5 and 11.2 state assumptions for radiation levels and shielding for minimizing radiation exposures and spread of contamination. However, increased activity in the SFP building and in the water has made radiation readings at the surface nominally 100 millirem per hour (mrem/hr) with readings of 10 mrem/hr at five feet above the surface. The rain boot around the large overhead opening door is not operable. SFP water levels have not been maintained per the analysis for personnel shielding. The numbers stated in the analysis are: a maximum of 15 mrem/hr at the surface and 1 mrem/hr in the area; a calculated increase of 0.5 mrem/hr during the fuel movement and 24 feet 6 inches of water over stored fuel assemblies.

d. FSAR section 9.3 discussed the SFP leak chase pump back system. This system was never installed on Unit 4 and was removed from Unit 3 without a review.

In summary:

The facility Operating Licenses, DPR-31 and DPR-41, Section III, make the licenses subject to 10 CFR 50.59. 10 CFR 50.59 allows the holder of a license to make changes in the Facility as

described in the safety analysis report without prior commission approval unless it involves a change to the Technical Specifications or is an unreviewed safety question. Records of determination must be kept and a report sent to NRC annually.

Contrary to the above, the licensee failed to meet the requirements of 10 CFR 50.59 in that a change was accomplished to the facility described in the SAR without the required review and resulted in the creation of an unresolved safety question. A license amendment was not requested as required. For several years, a normally-closed valve on each Unit's Spent Fuel Pit (SFP) cooling loop piping was operated in the normally-open position such that a malfunction could have completely drained the SFP. This is an increase in the consequences of a malfunction of equipment important to safety. The SAR states that he possibility of siphon draining of the SFP by a break in this pit drain piping is prevented by this normally-closed valve located six feet above the fuel assemblies. The SAR evaluated the possibility of breaks upstream of this normally-closed valve but did not evaluate other malfunctions of equipment downstream of the valve. This created the possibility for a malfunction of equipment of a different type than any evaluated previously. Thus, this was an unreviewed safety question because: it increased the consequences of malfunction of equipment important to safety; and it created the possibility for a malfunction of equipment of a different type than any evaluated previously.

The licensee submitted modified SARs in January 1976 and March 1984 to support license amendments, including Technical Specification changes, for the increase in SFP capacity and relining. The reviews should have identified the then-existing modifications to the SFP system operation which were not in accordance with either the FSAR or the submittals.

Additionally, either inadequate reviews or the lack of reviews permitted the following conditions to persist: normal operating SFP design parameters stated in the SAR were not maintained, causing abnormal SFP operating conditions; temperature and level indicators in the control room, which are part of the SFP system evaluation and design basis, were not reliable and were routinely inoperable precluding their use of warn of malfunctions; radiation levels increased periodically from maximums stated in the SAR because of failure to promptly recharge depleted demineralizers; and personnel shielding provided by the design water level was not maintained.