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

Report Nos.: 50-250/92-31 and 50-251/92-31

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 Conducted: November 16 - 20, 1992

Inspectors: P.S. Mellen 11/24/92
L. Mellen, Reactor Inspector Date Signed

For P.S. Mellen 11/24/92
L. King, Reactor Inspector Date Signed

Approved by: for T. Peebles 11/25/92
R. Crlenjak, Section Chief Date Signed
Operational Program Section
Operations Branch
Division of Reactor Safety

SUMMARY

Scope:

This inspection was conducted in the area of engineering and technical support for operations, maintenance, outages, testing, and surveillances. The inspection included a review of selected procedures and representative records, interviews with personnel and observation of activities in progress.

Results:

Based on the review of Engineering and Technical Support groups the inspectors concluded:

Engineering and Technical Support personnel aggressively identified and resolved emergent issues for both operations and maintenance.
The Engineering and Technical Support groups took a proactive approach to resolving difficult engineering problems.

The backlog of items on hold for Engineering and Technical Support review was very low.

The use of Probalistic Risk Analysis information for the evaluation of plant conditions was effective.

The information the Engineering and Technical Support staff trended and tracked provided the minimum information required for decreasing repetitive failures and observing potential system problems.

The training for engineering management was appropriate and the training for the remainder of the Engineering and Technical support staff was considered limited but adequate.

Maintenance specifications were an effective method to reduce both the engineering and maintenance backlog.

The Preventive Maintenance pilot program appeared to provide reasonable assurance that the Preventive Maintenance engineering basis would provide an effective use of system maintenance.

The goal of completing preparation of the top twenty refueling outage work packages six months prior to the beginning of the refueling outage was a very effective planning methodology.

Engineering organizations were effective in their actions during the hurricane recovery.

No Violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

A. Cifuentes, System Engineer
T. Carter, Chief Civil Engineer
B. Dunn, Engineering Mechanical Supervisor
J. Freyre, System Engineer
D. Feingold, System Engineer
J. Garazo, Technical Support Engineer
M. Giles, System Engineer
R. Gill, Civil Engineering Supervisor
D. Jernigan, Technical Staff Manager
M. Jones, Component Engineer
G. Hollinger, Training
A. Kasmir, Maintenance Engineer
T. Kendall, Site Engineering
W. Klein, Supervisor Maintenance Programs
*J. Knorr, Regulation and Compliance Supervisor
*R. Kundalkar, Site Engineering Manager
E. Lyons, System Engineer
J. Mack, ISI Engineer
C. Melchor, System Engineer
A. Ortega, PEG Project Engineer
J. Porter, Electrical Engineering Supervisor
K. Parekh, System Engineer
R. Radakovic, System Engineer
*T. Plunkett, Vice President Nuclear
G. Salamon, Licensing
D. Tseng, System Engineer
J. Varley, Component Engineer
B. Vincent, Corporate Engineer, PRA Group
*M. Wayland, Maintenance Manager

Other licensee employees contacted included instructors, engineers, mechanics, technicians, operators, and office personnel.

NRC Representatives

*R. Butcher, Senior Resident Inspector
G. Schnebli, Resident Inspector
L. Trocine, Resident Inspector

*Attended Exit Interview

2. Technical Support Work Activities (37700)

A. Organization

The inspectors reviewed the structure of the Engineering and Technical Support organization and observed an increased focus on operating plant support. The inspectors reached this conclusion based on interviews with selected personnel from the 57 Site

Engineering and 58 Technical Staff personnel dedicated to providing real time plant support. The inspectors also found that FPL had decreased the Engineering and Technical Support organization's dependence on contract engineering by thirty-six percent from 1991 to 1992.

1) Site Engineering

The principle responsibilities of Site Engineering were to provide day-to-day engineering support to resolve Civil, Electrical, Procurement, and Mechanical Engineering questions.

2) Technical Support Staff Personnel

The principle responsibilities of Site Engineering were to provide day-to-day engineering support to resolve Reactor Engineering, Inservice Inspection, System Engineering, and Component Engineering questions.

The inspectors concluded that this organizational structure, and the distribution of engineers in the Engineering and Technical Support organization provided reasonable assurance that the staff can support both normal and off-normal conditions.

B. Work Load

There were six Technical Staff engineers temporarily assigned to reduce the PWO backlog that required engineering support and analyze the backlog to determine where up-front engineering could prevent future PWO backlog. An example of this was the Engineering and Technical Support staff developed engineering specifications to support normal maintenance activities such as: temporary lead shielding specifications and conduit routing specifications. The licensee had diligently worked on reducing the NCRs from approximately 300 in 1990 to a current average backlog of less than 20 and TSAs had fallen from 110 in 1986 to approximately 20 active items. The composition of this group was altered to provide maximum use of the groups engineering resources. As the composition of the remaining PWOs changed, for example if there were more mechanical PWOs, management would add more mechanical engineers to the group and remove resources from areas that made up less of the PWO backlog. The inspectors reviewed the quantity of backlogged engineering work and concluded that the reduction not only represented a reduction of backlogged engineering work but was approaching the minimum normally expected engineering work backlog.

C. Trending and Tracking

The Engineering and Technical Support groups provided engineering support for maintenance and conducted trending and analysis for

both systems and components. Members of each Engineering and Technical Support group interviewed trended some aspect of their systems or components. The system engineers trended some system performance; although the level of trending varied significantly between the engineers. The inspectors reviewed the records of the information that was trended and interviewed the Engineering and Technical Support engineers performing the trending and tracking. The inspectors concluded the information routinely tracked provided the minimum information required for reducing repetitive failures and observing potential system problems.

The inspectors interviewed the IST engineer and determined that adequate tracking and trending was in place for the pumps and valves. The inspectors verified the procedural process was in place to ensure that the IST engineer concurred with and reviewed all post maintenance testing in this area. The inspectors concluded this program was adequate.

The inspectors did identify one example of the effective use of trending information. In late 1991 the licensee experienced many weld defects (about four percent) at the Quality Control inspection hold point. The supervisor in this area reviewed the trend of the defects and altered the program based on his interpretation of the observed results. The supervisor added a weld foreman hold point before the Quality Control hold point, put all the welders into one crew, put all the welders under one foreman, and held periodic meeting between the welders to discuss problems encountered. Management also changed the welder qualification program to require the completion of a written examination. The quantifiable result of this proactive trending was the defect rate dropped to less than one percent at the Quality Control inspection hold point. The inspectors considered this an example of appropriate use of trended or tracked information.

D. Configuration Management

The inspectors reviewed the P&ID reconstitution activity and observed examples of the revised P&IDs that were scheduled to replace the existing drawings. The new P&IDs were less congested and in the examples reviewed the new drawings were easier to read because of the additional pages used to display the drawings. The inspectors concluded the program was within the proposed completion scheduled. At the time of this inspection the reconstitution effort was about eighty percent completed. When the effort is completed there will be unit specific drawings, each system will be on a unique drawing, and the revised P&IDs will supersede plant operating drawings. The licensee stated that the reconstitution effort would be completed by the end of 1992 and the P&IDs will be issued during the first quarter of 1993. The system and component engineers routinely walked down their system and compared the updated P&IDs with the current system

configuration. The licensee promptly corrected any identified problems. A review of the backlog of drawing updates indicated occasional drawing updates were late. The inspectors concluded configuration management was adequate.

The inspectors reviewed the licensee's progress in the preparation of an instrument setpoint document and discussed the setpoint calculations and methodology with the cognizant Engineering and Technical Support staff member. The purposes of the instrument setpoint document were to consolidate instrument setpoints, maintain setpoints, provide calibration tolerances, and delineate special maintenance requirements. The inspectors noted the document was limited in scope to include only those devices providing signals, or devices where the process changes the state of the instrument or device. Devices such as timing relays, protective relays, limit switches, area radiation monitors, fire detection, and valves, along with operator action setpoints were considered outside the program's scope. At the time of this inspection, of the estimated 2640 setpoints included in the program 1018 were completed and 472 were in progress. The inspectors concluded that this program should provide a reasonable starting point for control of plant setpoint; however, there had not been enough progress to judge the program's effectiveness.

In the past the licensee did not have a formal method for ensuring the decisions made that effected the civil engineering basis for a system were documented in a way that was promptly retrievable. However, the licensee has implemented CN-2.28, Intake Structure Inspection Repair, which provided the guidelines for the conduct of activities associated with inspection and repair of intake structure concrete support members. The program was an attempt to ensure the decisions made that affected the civil engineering design basis for the five year intake structure long term resolution project was promptly retrievable and there was consistency between refueling outages. During interviews the licensee described their current methodology for capturing this information. This program had been in place for about one year and the inspectors concluded the program appeared effective.

E. Training

The inspectors reviewed representative training records and determined that the site Engineering and Technical Support managers were SRO certified. The two technical department managers also had SRO licenses. Most of the system and component engineers described their training as on the job training or informal. All system engineers interviewed described a self-study program, which included a review of design basis information, system performance requirements, regulatory requirements, and internal commitments. Following the completion of this self-study program the engineer received an oral examination. Upon successful completion of the oral examination, the engineer

received the classification of system expert. The inspectors reviewed representative samples of the self-study program for the systems engineers that would classify them as system experts and found them to be comprehensive. The inspectors reviewed the training records for the Engineering and Technical Support engineers and determined that, due to assignment changes, several system engineers were scheduled for additional training. A new and more extensive training program has been developed and will be in place by early 1993. Based on the background of the Engineering and Technical Support staff interviewed the inspectors concluded the training for management was appropriate and the training for the remainder of the Engineering and Technical support staff was considered limited but adequate.

F. Experience Level

The inspectors interviewed several Engineering and Technical Support staff members. The inspectors reviewed the background of several Engineering and Technical Support staff personnel and concluded that while the time in their current position was generally limited, their backgrounds in other positions were both varied and appropriate for their engineering positions. All engineers interviewed had engineering degrees, and most had either previous nuclear or non-nuclear engineering experience. The inspectors concluded the experience level was commensurate with the tasks the engineers were expected to accomplish and it was likely the experience level in Engineering and Technical Support positions would increase.

3. Technical Support Interface With Other Organizations

A. Technical Support Interface With Operations

The inspectors reviewed the interface between the Engineering and Technical Support organization and other site organizations during the inspection. Based on the interviews with operators the inspectors concluded that the Engineering and Technical Support personnel had effective interdisciplinary communications in the conduct of their activities. A typical operator stated that he would consult the technical support staff after any abnormal operation. The technical support engineering group would obtain site engineer assistance if tasks required to solve operations problems were beyond the resources of the technical support engineering group. Examples of this interface were the ERT for the feedwater heater tube rupture or the ERT for Sodium intrusion into the steam generators. The feedwater heater tube rupture required around the clock coverage during the repair, portions of which were provided by technical support. The Sodium intrusion event required the technical support group's assistance in location of the leak. The inspectors considered this interface adequate.

B. Technical Support Interface With Maintenance

Maintenance personnel were interviewed to determine if the Engineering and Technical Support groups were perceived as causing a delay in responding to work requests or if they were perceived as enhancing the process. Maintenance personnel stated Engineering and Technical Support engineers were responsive and supportive and enhanced the work request process. A review of monthly engineering reports did not indicate safety related work was delayed because of the interface with the Engineering and Technical Support groups. Quarterly PWO reviews were held to prioritize work. The meetings were attended by operations, maintenance planners, systems engineers, and outage management. The component engineers for the pumps and valves were interviewed and it was determined that they communicated well with the necessary maintenance and contractor personnel to resolve the many problems that occur in those disciplines. Although they had received limited vendor training and limited-on site training, a review of their backgrounds indicated they were well qualified for their positions. The Technical Support staff was responsible for the inplace testing of valves and the PEG group provided the necessary calculations. These interfaces were considered appropriate.

The inspectors selected the following two root cause analysis from the licensee root cause analysis log: RCA-92-T-016, Unit 3 MSSV Leaks and RCA-92-T-002, 3A EDG Air Compressor Failure. The inspectors also reviewed procedure 0-ADM-509, dated January 23, 1992, Root Cause Analysis. The inspectors concluded the analyses were thorough and had action plans for corrective action.

The inspectors interviewed the members of the civil engineering group to determine the level of support the Engineering and Technical Support organization provided for maintenance. The inspectors concluded that the Engineering and Technical Support organization was putting a greater emphasis on activities that supported maintenance. There were four areas where substantial support was evident: the development of maintenance specifications, the development of a PM program engineering basis, a dedicated Engineering and Technical Support group assigned to perform the engineering necessary to reduce the PWOs that were waiting for engineering actions, and the assignment of Engineering and Technical Support personnel to work in the maintenance organization during outages. These programs are described below:

1) Maintenance Specifications

The inspectors reviewed the development of maintenance specifications that delineated the technical requirements to perform normal maintenance, and establish the boundaries of work that was considered routine maintenance. The maintenance specifications that were written at the time of

the inspection were for grouting, conduit and box supports, temporary lead shielding, pulsation dampeners, protective coatings, component mounting and support, exterior lighting replacements, and insulating flanges. These maintenance specifications enveloped most normal maintenance for these components. This effectively reduced both the engineering and maintenance backlog by allowing routine maintenance to be evaluated within the maintenance organization for system or component maintenance within the specification's scope. The inspectors reviewed several selected maintenance specifications to determine if the specification set appropriate limits for maintenance. The inspectors reviewed SPEC-C-005, Specification for Component Mounting and Supports, which applied to components weighing less than fifty pounds. The primary objective was to provide generic mounting instructions and support details that could be used with Engineering design output documents to install replacement components. This document provided the appropriate details for mounting components and supports. The inspectors also reviewed SPEC-C-004, Furnishing and Application of Service Level II and Balance-of-Plant Maintenance Coatings, which delineated the technical requirements for protective steel coating and concrete substrate in areas outside the reactor containment buildings. The inspectors reviewed this specification and concluded the specification provided appropriate instructions for application of coatings. The inspectors also reviewed SPEC-C-003, Temporary Lead Shielding Installation; SPEC-C-012, Specification for Mounting and Support of High Pressure Sodium Plant Lighting; and SPEC-CN-2.29, Specification for Electrical Conduit and Cable Tray Supports. Based upon the review of these maintenance specifications the inspectors concluded they were an effective method to reduce both the engineering and maintenance backlog.

2) PM Program Engineering Basis

The inspectors reviewed the development of a PM program engineering basis. The program included a review of the existing program, a review of vendor recommendations, obtained industry and FPL maintenance failure data, and EPRI methods. During the discussions with Engineering and Technical Support personnel the inspectors determined that the intent of this program was to produce a reliability centered maintenance program. The first system to have this program applied to it was CVCS, charging and letdown, with the scheduled implementation date of December 1992. The inspectors interviewed the system engineer and his supervisor to determine their involvement in this process. The system engineer and his supervisor were unaware that this program was scheduled to be installed on the CVCS

system. The supervisor researched this to determine why the system engineer was not aware of these changes and informed the inspectors that the system engineer would be included in the process when the program required failure analysis review. The inspectors considered the failure to include the system engineer or the system engineer's supervisor in potential changes in the system's maintenance philosophy at an early stage in this process an ineffective use of available engineering resources. The inspectors concluded the pilot program appeared to provide reasonable assurance that the PM engineering basis program would provide effective system maintenance.

3) Reduction of PWOs Waiting for Engineering Action

The inspectors interviewed the dedicated Engineering and Technical Support group assigned to perform the engineering necessary to reduce the PWOs that were waiting for engineering actions. Based on discussions with engineering personnel about 72 PWOs had been resolved using this method. The maintenance personnel interviewed indicated this program was effective and the inspectors determined the program was reducing the backlogged engineering work.

4) Engineering and Technical Support for the Maintenance Organization During Outages

The inspectors reviewed the assignment of Engineering and Technical Support personnel to work in the maintenance organization during outages. The engineers assigned to the maintenance organization were those whose background was most applicable to the proposed outage workload. The inspectors judged this program as acceptable.

4. Surveillance Observation (61726)

A. Maintenance Surveillance Testing

The inspectors reviewed the maintenance surveillance testing program. The system engineers were provided with details of work planned for their system ahead of the scheduled work date. This enabled them to witness scheduled work, as appropriate. The technical support staff engineers witnessed some maintenance activities; however, most of this testing was the non-routine testing. The inspectors concluded the Engineering and Technical Support interface with maintenance surveillance testing was adequate.

B. Operations Surveillance Testing

The technical support engineers were responsible for the performance of several operations surveillance tests. The tests

were routine surveillances and provided the technical support engineers with valuable system performance data and in some cases were used as part of the Technical Specification testing program. The inspectors concluded the Engineering and Technical Support interface with operations surveillance testing was adequate.

5. Emergent Technical Issues

The inspectors reviewed the Engineering and Technical Support staff members' actions for emergent issues. The inspectors discussed the Engineering and Technical Support engineering group's response to emergent issues with maintenance and operations personnel. Based on the records reviewed and the personnel interviewed the inspectors concluded that the Engineering and Technical Support groups aggressively identified and resolved emergent issues for both operations and maintenance.

A. Operational Events

The inspectors determined that systems engineering participated in the maintenance quarterly scheduling activities. There was a strong engineering involvement in the identification and resolution of operational problems as evidenced by the discovery of the 4A RHR casing through wall leak and subsequent repair. Because of the difficulty to identify this problem (i.e. in a high radiation zone, the leak was very small, and the leak required physical contortions to locate) the inspectors considered the identification of this problem an example of proactive system engineering. Another example of strong engineering involvement was identifying the RHR pump seal had high contained leakoff due to the type of seal material. Following the system engineer's identification the seal material was altered and the venting procedure was changed to correct the problem. The inspectors concluded this was an example of proactive operational support.

The Engineering and Technical Support staff review daily plant operational data at varying frequencies. Most of the staff members interviewed reviewed operational data at least weekly. A few only reviewed the data if there were system problems. The inspectors concluded the review of plant data was adequate.

B. Feedback Of Technical Issues

The inspectors reviewed the licensee's methods for distributing technical information to the Engineering and Technical Support staff. Most of this was accomplished by routing the information from the licensing group or from the NPRDS coordinator. Material on industry events, information notices, vendor information, and other pertinent information was available to all Engineering and Technical Support staff members interviewed. The inspectors considered their knowledge of current technical information on their systems or components was adequate.

6. Outage Planning

The inspectors reviewed the licensee's approach to outage planning. The Engineering and Technical Support groups had a goal of completing preparation of the top twenty refueling outage work packages six months prior to the beginning of the refueling outage. This method allowed more effective handling of emergent work packages that were scheduled to be completed prior to the refueling outage. Based on discussion with management, the inspectors concluded that because of the early completion of the work packages, the planning meetings prior to the outage were able to focus more on contingency plans and were not required to devote as much of their resources on implementation plans. The inspectors found this was a very effective planning methodology. The inspectors also noted that despite the severe disruption caused by the hurricane recovery effort the top twenty refueling outage work packages were completed three and one-half months prior to the scheduled start of the next refueling outage and planning work had already begun for the following refueling outage. The inspectors concluded the methodology used for outage planning was good and the proposed goals were excellent.

The technical support group and site engineering provided support on-site while the hurricane was in progress. Damage assessment walkdowns were performed and punch lists were established for the systems. Systems were reviewed on a priority basis as necessary for startup. Before startup additional walkdowns were done. The inspectors concluded the engineering organizations were effective in their actions during the hurricane recovery.

7. Use of PRA Information

The inspectors reviewed an instrument air study that employed PRA methodologies. The inspectors discussed the study and use of the PRA in detail with the project engineer and the PRA engineer. Thirteen different configurations were examined before recommendations were made to the plant. The PRA group created reliability fault trees and made sensitivity runs for equipment reliability before providing results to PEG. The final recommendations, as a result of the analysis, were presented to management. The inspectors concluded that the engineering analysis and use of PRA to select a new instrument air system was an effective use of PRA information.

The inspectors discussed the methodology and concluded that most system and component engineers did not routinely use PRA information, but they were aware that the information was available and generally knew how to access the information. Some personnel that had been in system engineering for several years, had been involved in the review of the initial PRA information, but none of the system and component engineers interviewed had used the information recently. The inspectors concluded that this aspect of engineering involvement in the PRA program was average.

8. Exit Interview (30703)

The inspection scope and findings were summarized on November 20, 1992, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings. No proprietary material is contained in this report. No dissenting comments were received from the licensee.

9. Acronyms

CVCS	Chemical and Volume Control System
EDG	Emergency Diesel Generator
EPRI	Electric Power Research Institute
ERT	Emergency Response Team
FPL	Florida Power and Light
MSSV	Main Steam Stop Valve
NCR	Nonconforming Report
P&ID	Piping and Instrumentation Drawing
PEG	Production Engineering Group
PM	Preventive Maintenance
PRA	Probalistic Risk Assessment
PWO	Plant Work Order
RCA	Root Cause Analysis
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
TSA	Temporary Station Alteration