

ENCLOSURE 1
SALP BOARD REPORT

U. S. NUCLEAR REGULATORY COMMISSION
REGION II

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NUMBERS

50-250/86-27 AND 50-251/86-27

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNITS 3 and 4

NOVEMBER 1, 1984 THROUGH APRIL 30, 1986

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I. Introduction

The Systematic Assessment of Licensee Performance (SALP) program is an integrated NRC staff effort to collect available observations and data on a periodic basis and to evaluate licensee performance based upon this information. The SALP program is supplemental to normal regulatory processes used to determine compliance with NRC rules and regulations. The SALP program is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to licensee management to promote quality and safety of plant construction and operation.

An NRC SALP Board, composed of the staff members listed below, met on July 16, 1986, to review the collection of performance observations and data to assess licensee performance in accordance with guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at Turkey Point Units 3 and 4 for the period November 1, 1984, through April 30, 1986.

SALP Board for Turkey Point Units 3 and 4

- L. A. Reyes, Acting Director, Division of Reactor Projects (DRP), RII (Chairman)
- J. P. Stohr, Director, Division of Radiation Safety and Safeguards (DRSS), RII
- V. W. Panciera, Acting Director, Division of Reactor Safety (DRS), RII
- D. M. Verrelli, Chief, Reactor Projects Branch 2, DRP, RII
- L. S. Rubenstein, Director, PWR Project Directorate 2, Division of PWR Licensing - A, NRR
- D. G. McDonald, Project Manager, PWR Project Directorate 2, Division of PWR Licensing - A, NRR
- D. R. Brewer, Senior Resident Inspector, Turkey Point, DRP, RII

Attendees at SALP Board Meeting:

- S. A. Elrod, Chief, Reactor Projects Section 2C (RP2C) DRP, RII
- R. V. Crlenjak, Senior Resident Inspector, St. Lucie, DRP, RII
- K. D. Landis, Chief, Technical Support Staff (TSS), DRP, RII
- J. K. Rausch, Reactor Engineer, TSS, DRP, RII
- T. C. MacArthur, Radiation Specialist, TSS, DRP, RII
- S. Guenther, Project Engineer, RP2C, DRP, RII

ii. Criteria

Licensee performance is assessed in selected functional areas depending on whether the facility has been in the construction, preoperational, or operating phase during the SALP review period. Each functional area normally represents an area which is significant to nuclear safety and the environment and which is a normal programmatic area. Some functional areas may not be assessed because of little or no licensee activity or lack of meaningful NRC observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria was used to assess each functional area; however, the SALP Board is not limited to these criteria and others may have been used where appropriate.

- A. Management involvement in assuring quality
- B. Approach to the resolution of technical issues from a safety standpoint
- C. Responsiveness to NRC initiatives
- D. Enforcement History
- E. Operational and construction events (including response to, analysis of, and corrective actions for)
- F. Staffing (including management)
- G. Training and qualification effectiveness

Based upon the SALP Board assessment, each functional area evaluated is classified into one of three performance categories. The definitions of these performance categories are:

Category 1: Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used such that a high level of performance with respect to operational safety or construction quality is being achieved.

Category 2: NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and are reasonably effective such that satisfactory performance with respect to operational safety or construction quality is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used such that minimally satisfactory performance with respect to operational safety or construction quality is being achieved.

The functional area being evaluated may have some attributes that would place the evaluation in Category 1, and others that would place it in either Category 2 or 3. The final rating for each functional area is a composite of the attributes tempered with the judgement of NRC management as to the significance of individual items.

The SALP Board may also include an appraisal of the performance trend of a functional area. This performance trend will only be used when both a definite trend of performance within the evaluation period is discernible and the Board believes that continuation of the trend may result in a change of performance level. The trend, if used, is defined as:

Improving: Licensee performance was determined to be improving near the close of the assessment period.

Declining: Licensee performance was determined to be declining near the close of the assessment period.

III. Summary of Results

A. Overall Facility Evaluation

Weakness in facility performance have been noted in the plant operations area; the maintenance area; the quality programs and administrative controls affecting quality area and the training qualification effectiveness area. The emergency preparedness area was improved to a major strength area. Management attention to the facility has been intense during this assessment period. The various areas of the Performance Enhancement Program (PEP) have been pursued vigorously as have other initiatives to improve performance. While the general trend is improving and the plant and its staff is in better condition than at the beginning of the period, a number of individual significant events and inspection findings caused by licensee weaknesses have precluded higher ratings at this time. Two especially significant licensee initiatives were commenced during this period; reconstitution of safety system design basis and change over to modified Standard Technical Specifications (TS). These initiatives are of far greater magnitude and scope than any similar initiatives at other utilities. These initiatives are very closely managed and are scheduled to be completed during the next SALP period. We believe that they are the keys to improved performance.

- B. The performance categories for the current and previous SALP period in each functional area are as follows:

<u>Functional Area</u>	<u>July 1, 1983 - October 31, 1984</u>	<u>November 1, 1984 - April 30, 1986</u>
Plant Operations	3	3
Radiological Controls	2	2
Maintenance	3	3
Surveillance	2	2
Fire Protection	2	2
Emergency Preparedness	2	1
Security and Safeguards	2	2
Outages	Not Rated	2
Quality Programs and Administrative Controls Affecting Quality	3	3
Licensing Activities	1	2
Training and Qualification Effectiveness	Not Rated	3

IV. Performance Analysis

A. Plant Operations

1. Analysis

During the evaluation period, inspections of plant operations were performed by the regional and resident inspection staffs. The major activities at Turkey Point included routine commercial operation for Units 3 and 4 with maintenance outages conducted on both units. Turkey Point Unit 4 shut down in January 1986 for refueling and Appendix R modifications has remained in cold shut down pending resolution of emergency diesel generator loading issues. Turkey Point Unit 3 refueled between April and June 1985.

The licensee's general performance in the plant operations area remained weak throughout a significant portion of the SALP period; a number of operations problems were identified by both the NRC and the licensee and are discussed below. The licensee has

at hot standby for several days without the accumulators available was not reviewed by the Plant Nuclear Safety Committee (PNSC) prior to implementation. (Violation g refers.)

During several days in July 1985, Unit 4 was operated at full power with both source range nuclear instruments out of service due to calibration deficiencies. The Maintenance Department did not place the appropriate priority on the repair effort until the NRC asked the licensee to justify the delays. The Operations and Quality Control (QC) staffs had tolerated this condition for at least four days prior to initiating corrective maintenance.

In July 1985, the Unit 3 axial flux deviation alarms were declared out-of-service because the computer which processes the axial flux signals had not been updated with the appropriate alarm setpoints, which had been available for over six weeks. The Operations staff had to compensate for the deficient annunciators by taking manual axial flux readings per the TS. For approximately three days, the Operations staff worked around a problem that a reactor engineer later corrected in less than an hour.

On November 29, 1985, the licensee reported that portions of the Unit 3 and 4 cold leg accumulator fill lines were not seismically qualified. Isolation valves in the accumulator fill lines were not shut, however, until eight days after an engineering evaluation determined that they should be.

On February 13, 1986, Power Plant Engineering informed the Turkey Point Staff that an intake cooling water (ICW) valve was single failure prone and could defeat the entire accident heat removal system. The licensee failed to take appropriate compensatory action, until required by NRC Region II. Proposed enforcement action is pending.

The licensee's approach to the resolution of technical issues, an area identified as inadequate in the previous SALP, has remained inadequate. The licensee has not expeditiously identified the safety significance of operational problems known to exist in several safety-related systems. For example, a 10 CFR 21 evaluation on main steam isolation valve (MSIV) failure modes was delayed for nine months and a similar evaluation on ICW control valves was delayed for 18 months. Both issues were eventually determined to have safety significance. Correction of Component Cooling Water (CCW) piping discrepancies for two high head safety injection pumps was delayed for several years during which the potential for single failure was not correctly evaluated. Enforcement action was taken subsequent to the SALP period. The spent fuel pool was operated in a cooling configuration that could have drained the pool and was outside of the safety analysis.

System realignment was delayed for several months subsequent to NRC identification of the problem. The Auxiliary Feed Water (AFW) system nitrogen supply was not adequately tested following the establishment of redundant trains. The AFW system flow control valve trim was not properly adjusted for several years, preventing stable system operation in the automatic mode. The instrument air system was operated without regard for the functionality of heaters, dryers and moisture separators, resulting in water entering the system and adversely affecting the operability of the AFW flow control valves.

Operation of the two units was severely impacted by the repetitive failure of the instrument bus static inverters. Unreliable operation had been experienced for several years, and inverter failures were responsible for several reactor trips during the summer of 1985. Despite the repetitive inverter failures, the licensee failed to develop adequate Off Normal Operating Procedures (ONOPs) for loss of 120 volt vital instrument panels. The procedures failed to address methods of restoring system operability; consequently, the units were subjected to transients of a larger and more severe nature than was necessary. All 12 static inverters were replaced between July and September 1985.

In June 1985, the Unit 4 reactor tripped due to the loss of the 4C inverter and instrument panel 4P06. Numerous vital control and indication circuits remained de-energized for approximately 50 minutes resulting in a significant decreasing pressure transient. The pressure transient appeared to be aggravated by excessive pressurizer spray bypass flow, but the licensee did not pursue that possibility in a timely fashion. The licensee subsequently confirmed that the bypass valves were 1/2 turn open instead of the required 1/8 turn open.

Procedural compliance, an area which has received significant management attention, has improved but remains a problem as indicated by the numerous Technical Specification 6.8.1 violations in the areas of operations, maintenance and surveillance. Management's requirement for verbatim compliance has been amply promulgated via inter-office correspondence and lecture presentations. The Procedure Upgrade Program (PUP) has improved the form and content of many procedures thereby reducing misinterpretations and personnel errors. A total of 740 procedures will be revised in the areas of normal and emergency operation, surveillance, and maintenance. The program remains on schedule and is approximately 85 percent complete. Procedures generated by the PUP are clearly written and give due regard to human factors concerns. The pre-implementation review process each procedure receives is extensive and includes input from knowledgeable staff members. A general willingness exists to correct procedural discrepancies by submitting procedure change requests when necessary. Nevertheless, procedural noncompliances continue to occur, usually as the result of inattentiveness during implementation.

Personnel errors during 1985 and the first quarter of 1986 resulted in 13 Unit 3 and 11 Unit 4 inadvertent actuations (partial or complete) of the Engineered Safety Features (ESF) circuitry. Of these actuations, four resulted in Unit 3 reactor trips and three resulted in Unit 4 reactor trips. The licensee has developed a program to protect sensitive relays from jarring by installing protective covers and barriers. Considerable effort has been expended to minimize inadvertent ESF actuations. However, during the first four months of 1986, six actuations occurred, two on Unit 3 and four on Unit 4.

During this SALP period the Turkey Point Plant reported 109 non-security events to the NRC Operations Center as required by 10 CFR 50.72. Of these events, 40 percent were due to equipment failures and 19 percent were due to operator errors. A large number of the operator error events were due to inadvertent operation of equipment caused by personnel accidentally bumping relays, shorting contacts, etc., while performing maintenance or troubleshooting. It appears that these types of errors could be due to inadequate training or procedures.

Of the 109 reportable events, 13 were of sufficient interest to result in operating reactor event briefings to NRC management. This is a relatively high number compared to other operating plants.

The number of trips at Turkey Point was slightly less than the industry average and the availability factor for Unit 4 was significantly higher than the national average.

A strong program requiring independent verification exists. The program has assisted in reducing personnel errors and has the full support of plant management. The program is effectively implemented, primarily through the clearance tag process and by incorporation into operations, maintenance and surveillance procedures.

The staffing of the Operations Department is currently adequate to meet management objectives. The staffing level has increased from 85 in January 1984 to 136 as of June 1986. The Operations Department had hoped to implement a program to place an additional senior reactor operator (SRO) on each shift as an assistant to the Plant Supervisor-Nuclear, but the passing rate for SROs on NRC licensing examinations has not yielded a sufficient number of extra operators to support that objective. This augmentation was further delayed by a poor pass rate on NRC requalification exams but is expected to occur in the fall of 1986. (See the Training Analysis for additional discussion.) The on-shift administrative burden of the Shift Supervisors has, however, been greatly alleviated by the addition of administrative technicians.

Activities associated with the Performance Enhancement Program (PEP) were closely monitored. The PEP, which was confirmed by an NRC Order dated July 13, 1984, is intended to address NRC concerns, improve regulatory compliance and implement regulatory corrective actions, and is scheduled to continue into 1987.

The PEP has coordinated improvements in the following areas: organizational structure and personnel, Quality Assurance (QA) program, upgrade of the Technical Specifications (TS), establishment of safety engineering groups, allocation of additional resources and upgrade of facilities, operations enhancement, procedures upgrade, improvement of the plant configuration control program, and training and improvements in maintenance management. A Program for Improved Operation (PIO) was added to the PEP by a Confirmation of Concurrence letter on October 11, 1984, and includes reviewing the Final Safety Analysis Report (FSAR) to assure plant operation within the safety analysis, identification and correction of surveillance program deficiencies, and increased management awareness and overview of operations. Improvements under the PEP/PIO are discussed in this and other functional area analyses, as appropriate.

In general, the implementation of the PEP/PIO has shown successes in that adequate corporate attention and resources have been focused on identified problem areas. Adherence to established schedules and regional briefings have been satisfactory in most areas. Upper management's commitment to excellence is apparent not only in the Turkey Point PEP but also in other corporate quality improvement programs. Licensee management has continued to implement and to support PEP and has expanded the program to include areas not originally addressed. Of the original 190 tasks, 156 were completed prior to March 1986. Approximately 148 new tasks were added in January 1986 to reconstitute selected system design bases, improve maintenance and enhance design control.

On-site management involvement and control has been improved by modifying the Nuclear Energy Department organization. The Site Vice President has assumed overall management responsibility for the nuclear facility. This has allowed better control and allocation of on-site resources and has improved the control of construction activities, especially during the on-going fire protection modifications. Corporate engineering has become more responsive to the plant since the addition of on-site engineering representatives.

In February 1986, a Site Engineering Manager (SEM) position was established at the Turkey Point Site. This enhanced engineering function should provide faster resolution of maintenance and

engineering issues (as discussed later in the Maintenance Analysis) and have a concurrent positive impact on operations. A Safety Engineering Group (SEG), which reports to the Site Vice President, was also established to provide an overview of nuclear safety issues. Duties include procedure reviews, system walkdowns and review of operating and maintenance practices. Their expertise was utilized in an initial review and verification of system design bases and will be utilized to review the completed design basis documents.

The thrust of the QA program was changed to be more operationally oriented, additional personnel have been added to the staffs and training has been and is being provided. Some personnel are receiving operations training similar to that of licensed operators. A period of continuous on-shift QA coverage early in the SALP period helped improve licensed operator procedural compliance.

The existing TS are being modified to make the format and contents more explicit and consistent with Standard Technical Specifications (STS). The submittal is now scheduled for September 1986.

Reviews of the TS and FSAR were performed to identify systems and components which were not receiving comprehensive operability testing. Numerous discrepancies were identified and are being corrected. The results of these reviews are being included in the TS rewrite and in the surveillance program. The licensee is further pursuing retrieval of design basis documents to assist in the correction of potential discrepancies.

The improvements to the site facilities include new buildings for health physics, administration, training and the simulator, and maintenance. The progress on the buildings has been on schedule and the evident commitment to upgrade the facilities and the expenditure of funds has aided plant staff morale. Consolidation of the nuclear plant staff should improve management effectiveness and overall efficiency. The plant specific simulator is expected to enhance operator training. The health physics and administration buildings are occupied and the improvements in communications and morale are impressive.

Operations improvements have been made in several areas. A valve tagging program has greatly reduced those valves in safety-related systems which were not labeled. A program exists to replace aluminum tags with larger, more legible, fiberglass, color-coded tags. An equipment stenciling project has improved component and area identification. Major components, systems, rooms and buildings are clearly marked. Separation of Unit 3 and 4 equipment is emphasized by color-coding, with tan representing Unit 3, blue representing Unit 4, and orange representing common equipment.

Operations planning and integrated facility operation have been improved by implementation of a morning status meeting chaired by the Plant Supervisor - Nuclear (PSN). The meeting is attended by all staff disciplines and provides an excellent forum for identifying potential conflicts between scheduled evolutions. The appointment of an Operations/Maintenance Coordinator, who is responsible for integrating the activities of the two departments, has been of particular benefit. Communication between the two departments has improved dramatically.

Shift transition and information exchange has improved and is effective. During the shift transition, control room access is limited to essential operations personnel. Shift turnovers are formally conducted utilizing checklists and written status summaries. The Shift Supervisor conducts a briefing of the relieving crew to maximize awareness of evolutions scheduled during the shift. Control Room Operator awareness of alarms, annunciators and equipment discrepancies has improved and is satisfactory. Work orders are promptly generated for any equipment failure in the control room. The status of the Plant Work Order (PWO) backlog is discussed in the maintenance analysis. A major improvement has occurred in the identification of equipment malfunctions by plant personnel as they perform their routine duties.

Control room demeanor was satisfactory. The relatively small, dual unit control room is susceptible to crowding and across-room discussions. However, the Shift Supervisors actively maintain decorum and minimize visits by nonessential personnel during plant evolutions. Each watchstander is readily identified by a posted nameplate at his duty location.

Continued management emphasis on housekeeping has improved plant cleanliness; housekeeping problems were uncommon, and general area cleanliness is fully satisfactory. Work sites emphasize partial cleanup as the repair effort progresses, thereby minimizing the need for large-scale, post-maintenance cleanup. Improved cleanliness in the auxiliary feedwater pump area, the Unit 4 containment, the residual heat removal pump area and the auxiliary building have been particularly noteworthy. The license has also initiated a program to reduce the amount of floor space which is radiologically contaminated thereby enhancing the ease of operations. Significant progress has been made in reducing contaminated floor space in the radiological waste building, the auxiliary building, the Unit 4 containment building, and the spent fuel storage area. (This topic is further discussed in the Radiological Controls analysis.)

Fourteen violations were identified:

- a. Severity Level III violation (with a \$100,000 civil penalty) for failure to operate the spent fuel pool cooling system as described in the Final Safety Analysis Report and not performing the requisite safety evaluation per 10 CFR 50.59. (85-23)
- b. Severity Level IV violation for failure to maintain the minimum degree of redundancy for the overpower and over-temperature delta-T protection circuits. (250/84-39)
- c. Severity Level IV violation for failure of an off normal operating procedure (4-ONOP-003.6) to address all failures which could occur when vital instrument panel 4P06 was lost. (85-20)
- d. Severity Level IV violation for failure to perform a Unit 3 accumulator boron concentration analysis prior to heatup above 200 degrees F, contrary to the TS. (250/85-24)
- e. Severity Level IV violation for three examples of failure to follow procedures (independent verification prior to RHR periodic test, instrument air dryer operation, use of temporary system alterations). (85-30)
- f. Severity Level IV violation for taking a Unit 3 source range nuclear instrument out of service without placing the level trip switch in bypass, and for failure to establish the initial conditions for a feedwater pump start per procedure 3-OP-074. (250/85-42)
- g. Severity Level IV violation for procedural inadequacies allowing heatup and pressurization of the RCS without the cold leg accumulators in service and EDG maintenance without restoration of the normal valve lineup. (85-44)
- h. Severity Level IV violation for failure to comply with the AFW Technical Specification 3.8.4.B. (251/84-40)
- i. Severity Level IV violation for failure to comply with TS 3.5 by manually blocking the high steam flow safety injection signal when average coolant temperature was above 543 degrees F. (251/85-24)
- j. Severity Level IV violation for failure to comply with TS 3.3.3, in that a Unit 4 steam generator blowdown isolation valve was made incapable of automatic closure by an inappropriate temporary system alteration. (251/85-30)

- k. Severity Level IV violation for failure to meet the TS operability requirements for the EDGs. (85-13)
- l. Severity Level IV violation for three examples of failure to properly establish and implement procedures. (86-10)
- m. Severity Level IV violation for two examples of failure to properly implement procedures. (250/86-17)
- n. Severity Level V violation for failure to properly implement Preoperational Procedure 0800.55, Diesel Generator A Breaker 4AA20 Control Rerouted Cable Preoperational Test. (85-20)

Violation (c) listed in the Maintenance analysis also cited a failure to establish abnormal operating procedures for a loss of the 4A motor control center.

Violation (d) listed in the Maintenance analysis included a failure to properly secure the "A" and "C" AFW pumps following operation. This failure to follow procedure resulted in the subsequent mechanical overspeed of both pumps when called upon to operate.

2. Conclusion

Category: 3

Trend: Improving

3. Board Recommendations

The Board recognized the fact that licensee management has expended significant effort to improve performance in the operations area.

B. Radiological Controls

1. Analysis

During the assessment period, inspections were conducted by the resident and regional inspection staffs. The regional inspection effort included three routine radiological controls inspections and one reactive inspection involving a potential overexposure incident.

During the assessment period, the licensee's health physics staffing level appeared to be adequate and radiation protection staff turnover was generally low. Contract health physics technicians were used to supplement normal health physics staffing levels which permitted the licensee to provide adequate health physics coverage for routine and outage operations.

Facility management support and involvement in the radiation protection program appeared adequate. Quality assurance audits of the radiation protection program appeared to be adequate in scope, but lacking in depth, possibly due to the minimal health physics experience of the quality assurance auditors. Licensee management has committed to provide additional health physics training for the quality assurance personnel who perform audits of the radiation protection program. The corporate health physics staff also performs audits of the plant's radiation protection programs. Due to corporate office concerns, the licensee is evaluating the effectiveness of the corporate health physics group's audits of the site's radiation protection program.

Guidance provided by the corporate health physics group to the licensee's two sites was inconsistent in that it recommended the implementation of an alpha radioactivity survey program at the St. Lucie facility, but did not evaluate the need for a similar program at the Turkey Point plant. IE Inspection Report Number 50-250, 251/86-12 identified the presence of measurable quantities of alpha emitting radionuclides in the Unit 4 containment. The licensee needs to consider applying program changes in this area to both its sites.

The licensee's responsiveness to NRC initiatives was generally adequate during this assessment period. Improvements were made or planned for NRC identified weaknesses concerning the alpha survey program and the internal exposure evaluation program.

In the area of radiological measurements, the licensee participated in the NRC's spiked sample program. The licensee's results were in agreement with known concentrations of radioisotopes.

The licensee submitted the required effluent and radiological environmental reports. There was one unplanned gaseous release from the chemical and volume control system during the report period. The release was evaluated and it was determined that the maximum permissible concentration (MPC) limits for the site boundary had not been exceeded. There were no unplanned liquid releases during the evaluation period. Releases of liquid and gaseous effluents were lower than Regional averages and were within the prescribed limits of the Technical Specifications. 3,120 curies (Ci) of fission and activation gases and 0.015 Ci of iodine-131 were discharged to the atmosphere in gaseous effluents from both units in 1985. The Region II averages for a two-unit site (based on 14 operating PWRs) were 13,140 Ci and 0.30 Ci, respectively. Liquid effluents contained 0.90 Ci of mixed fission and activation products and 385 Ci of tritium. The 1985 Region II averages were 1.9 Ci and 760 Ci, respectively.

Offsite doses calculated for liquid and gaseous effluents were within 10 CFR Part 20 and 10 CFR Part 50, Appendix I, guidelines. For 1985 releases, the maximum calculated doses to a member of the public were 0.0082 mrem from liquid effluents and 0.0796 mrad combined gamma and beta radiation dose from gaseous effluents. The maximum calculated dose from gaseous iodine-131 releases, to the thyroid of a hypothetical infant was 0.25 mrem. These calculated doses represented 0.27 percent, 0.51 percent, and 1.6 percent of the prescribed limits for liquid and gaseous releases. In the area of plant chemistry, the licensee experienced significant difficulty in controlling the secondary water chemistry of both units, and, to a lesser extent, the primary chemistry of Unit 3. These difficulties were attributed to unstable plant operations, condenser tube leaks, turbine boot (vacuum) leaks and problems with the water treatment plant. The licensee has adopted the Steam Generator Owners' Group guidelines for secondary water chemistry control and was striving to develop the capabilities to implement the stringent requirements of the program. Significant progress was being made to upgrade the chemistry staff, however, the secondary laboratory and sampling facilities remain inadequate. The laboratory is very small and the sampling facility is exposed to the environment in an open panel on the mezzanine deck.

Collective personnel exposure during 1985 was 600 man-rem per reactor. This was above the average (425 man-rem) for U. S. pressurized water reactors (PWRs), but is not considered significant in light of the extensive outage activity during this period.

During 1985, the licensee disposed of 10,220 cubic feet (ft³) of solid radioactive waste containing approximately 748 curies of activity per reactor. This was less than the average for U. S. PWRs of 11,650 ft³. The radwaste goal for 1986 is 9,000 ft³ per reactor.

In 1986, the licensee began evaluating the effectiveness of the contamination control program by tracking the total area of the plant which is controlled because of radioactive contamination. At that time, 28,727 square feet (44 percent of the plant) were being controlled. Although, as noted in the operations analysis, there appears to be progress in reducing some contaminated areas, it is too early to judge the overall effectiveness of the program.

One significant enforcement issue during the assessment period involved the unauthorized entry of an Instrument and Control Technician into the traversing incore probe (TIP) drive area. Although the exposure received by the individual during the entry did not exceed the regulatory limit, a substantial potential for overexposure did exist. Several procedural violations occurred before and during the worker's entry. The violations included

failure to notify health physics personnel prior to operation of the incore detectors, performing work outside the scope of the Plant Work Order, failure to have two persons present during the entry, and failure to keep the worker's exposure within the limits established by the Radiation Work Permit for the job. Furthermore, the worker's foreman failed to provide adequate instructions on the Plant Work Order for the maintenance tasks to be performed by the worker. The worker also received inadequate training in the use of the radiation survey instrument issued to him to control his exposure while inside the containment. Consequently, he failed to recognize that the instrument malfunctioned when the radiation levels exceeded the upper limits of the instrument.

The licensee has responded to this violation and requested mitigation of both the severity level and the civil penalty; the NRC is evaluating the licensee's response and request.

Three violations were identified:

- a. Proposed Severity Level III violation and \$50,000 civil penalty for failure to adequately train personnel and failure to follow procedures. (86-04) The licensee's request for mitigation is under review.
- b. Severity Level IV violation for shipment of a low specific activity burial box that failed to meet the strong, tight container requirements of 49 CFR 173.425(b). (85-17)
- c. Severity Level V violation for failure to perform a daily energy calibration on the health physics Germanium-lithium spectrometer (84-40/41).

Violation (b) listed in the Maintenance Analysis also cited two examples of failures to comply with the protective clothing requirements of a Radiation Work Permit.

2. Conclusion

Category: 2

3. Board Recommendations

No changes in the NRC's inspection resources are recommended.

C. Maintenance

1. Analysis

During the evaluation period, inspections were performed by the resident, regional and headquarters staffs. Several maintenance-related problem areas representing fundamental deficiencies and

oversights were identified. The areas of concern are related in that they require increased supervisory involvement in the operation and maintenance of the plant. A concern exists that the Turkey Point maintenance program may have been deficient to the extent that necessary plant repairs and enhancements were excessively delayed or omitted. This attitude was contrary to the "preventive maintenance" philosophy generally credited with reducing significant maintenance-related events.

As mentioned in the previous SALP, management's approach to the resolution of technical issues has remained a concern. Corrective actions were often not timely and failed to identify the root causes of problems. Some maintenance problems have existed for a long period of time. While the problems may not have been ignored, the rate of progress toward resolution was excessively slow. Maintenance repairs were occasionally terminated prior to determining the root cause problems. There was a tendency to accept the first plausible explanation for a problem and a hesitancy to perform the type of detailed testing necessary to differentiate between two equally valid hypotheses. Specific examples are itemized below.

- ° During June and July 1985, the "B" AFW pump tripped repeatedly on electronic overspeed because of an incorrectly adjusted trip setpoint. Failure to resolve the root cause of the June overspeed event directly contributed to a repeat trip in July. Even following the July trip, the licensee did not seriously consider overspeed testing until NRC Region II management requested that action be taken.
- ° During July 1985, numerous operating problems were experienced with the AFW flow control valves and main feedwater bypass valves. While repairing the valves, water was discovered in the instrument air lines for the valve actuators. The air lines were blown down until no additional water was observed, but the source of the water was not addressed.
- ° In May 1984, the licensee first began to experience instrument inverter failures, with at least 14 separate losses occurring through August 1985. The licensee initially maintained that the complete inverter changeout could not be accomplished until March 1986. After additional inverter failures occurred, the licensee initiated a changeout schedule that replaced all inverters five months ahead of the previous "best possible" schedule. To the licensee's credit the expedited inverter replacement was well controlled and was completed without incident while the units were operating.

- The AFW pump turbine steam admission valves have been leaking excessively for years. On one occasion, the pumps were improperly secured because the shutdown procedure was more complex than would otherwise be necessary to compensate for the leaking steam admission valves. This leakage also caused some AFW system steam admission stop check valves to fail in December 1985. Repairs were made without identifying the root cause of the failures. Consequently, corrective action was inadequate and some stop check valves failed again in January 1986, forcing a reactor shutdown. A regional inspection revealed inadequacies in management's involvement in assuring quality and its approach to the resolution of technical issues from a safety standpoint. A surveillance (radiography) program had been initiated to detect additional stop check valve failures. However, poor understanding of the procedures and policies established to ensure that proper actions were taken resulted in inadequate management involvement in evaluating the radiographs. Management remained unaware of additional valve failures until they were identified by the NRC inspector. The licensee's failure to adequately evaluate the operability of the AFW system and locate parts missing from the failed check valves was included in escalated enforcement action issued subsequent to the SALP period.
- AFW system flow was known to oscillate when operated in the automatic mode with control room flow indication shifting rapidly from 0 to 300 gpm. The control room operators had to take manual control of the system shortly after automatic initiation to stabilize control room indications. This was an AFW flow control valve trim problem which existed for several years and was not corrected until March 1986.
- The inadequacy of source and intermediate range nuclear instrument maintenance was discussed in the previous SALP. Those instruments still suffer from inadequate maintenance. It is not uncommon for at least one instrument to be out of service on each unit, and at times both source range instruments on a single unit have been inoperable at the same time.
- The area radiation monitoring system and process radiation monitoring system frequently have numerous inoperable channels.
- Cooling water piping to the high head safety injection pumps was known to be improperly installed and corrective action was delayed until the significance of the discrepancy was identified by the NRC. Enforcement action is pending.

Many additional maintenance problems had not been expeditiously addressed as evidenced by the large accumulation of incomplete Plant Work Orders (PWOs) prior to 1986. The number of active PWOs has been reduced from almost 900 in the fall of 1985 to approximately 450 in June 1986. The goal is to reduce the outstanding PWOs to no more than 250, and to begin work on each PWO within 48 hours after issuing the maintenance request.

The staffing of the Maintenance Department is adequate to provide maintenance services during routine plant operation. However, the experience level of the Instrumentation and Control (I&C) technicians is low, and contract I&C technicians have been employed to help reduce the PWO backlog to a more manageable level. The problem has been acknowledged by the licensee and stems from excessive personnel turnover both through attrition and selection for licensed operator training. Turnover rates of the mechanical maintenance staff were also high during the fall of 1985.

As mentioned previously, the management staff has, over the past two years, had difficulty enforcing their procedural compliance policy. There have been several failures to comply with Administrative Procedure (AP) 0190.19, "Control of Maintenance on Nuclear Safety Related and Fire Protection Systems", and repeated failures to implement AP 0190.10, "Cleaning of Nuclear Safety Related Systems and Components". There have been two occasions where procedures have failed to prevent electrical connections from being removed and replaced without quality control verifications. In November 1984, an inspector followup item was created to ascertain whether the licensee's program for verifying the acceptability of hoisting and rigging equipment was being adequately implemented. Since that time, three instances of hoisting and rigging noncompliances have been identified. Recently, very severe administrative personnel actions have been pursued by the licensee against personnel who fail to correctly implement procedures.

Lack of training, inexperienced personnel, and inadequate supervisory involvement also contributed to maintenance-related problems. In May 1985, a technician pulled a fuse for a circuit other than the one he was assigned to work on. RHR cooling, which was being utilized at the time, was lost for three minutes due to lack of an available flow path. In June 1985, a Unit 4 shutdown was required because both EDGs were out of service. The problem occurred because Maintenance personnel, using high pressure water, sprayed the motor control center (MCC) supplying power to "A" EDG auxiliary equipment. The workers were not aware that the MCC was important, so they took little care to prevent water from entering the cabinets. Recent improvements have been noted in the amount of direct foreman supervision at the job site, which should aid in reducing the frequency of maintenance - related problems.

The licensee has addressed several problem areas with both short-term and long-term corrective actions in the Instrumentation and Control (I&C), Mechanical and Electrical Maintenance Departments. The I&C staff had been increased and two engineers have been added to each department. A response team concept is being used to evaluate significant equipment issues and plant transients in a effort to enhance root cause identification and corrective actions. As discussed in the training analysis, maintenance training was suspended for a significant period of time, but in January 1986, training in systems and specific equipment was resumed. The Superintendent of Maintenance is effectively utilizing personnel, has established a permanent preventive maintenance staff, and is demanding procedural compliance.

In December 1985, following the identification of numerous concerns during an NRC Safety System Functional Inspection, the licensee determined that the PEP should be augmented in the areas of maintenance and design control. The maintenance effort addressed augmentation of maintenance procedures, including post-maintenance testing and independent verification; controls over plant work orders; training and experience of maintenance personnel; and updating the preventive maintenance program to incorporate predictive maintenance techniques. A formal maintenance assessment using INPO guidelines has been initiated.

Long-term corrective action for equipment failures is being pursued by developing an analytically based preventive maintenance (ABPM) program. The program will cover selected safety-related systems and will take approximately two years to complete. The program will be extensive and has required significant resources, both personnel and monetary, to develop and implement. The ABPM is designed to develop, through quantitative and qualitative analyses, those preventive maintenance (PM) tasks necessary to maintain component operability. Specific procedures for the implementation of the ABPM are under development on a per-system basis. Procedures for PM of the auxiliary feedwater system were approved in June 1986.

A program was developed in late 1985 to enhance source range nuclear instrument (SRNI) operability through the combined efforts of management, a quality improvement team and manufacturer's technical representatives. Enhanced system operability has yet to be achieved, but necessary improvements, both physical and procedural, have been identified.

Management involvement in the resolution of maintenance issues improved significantly in February 1986 as a result of establishing a position of Site Engineering Manager (SEM). The SEM supervises both construction and plant staff engineering activities. Strengthening the engineering supervisory function at

the plant instead of the corporate engineering office should provide faster resolution of engineering and maintenance issues. In early 1986 a formalized review process was developed to facilitate the timely resolution of technical issues. The numerous stages of engineering review, as well as greatly improved mechanisms for feedback and tracking, should preclude the recurrence of maintenance and engineering problems similar to those experienced in 1985.

The licensee has expanded the PUP to include approximately 250 corrective maintenance procedures and 200 maintenance surveillance procedures. This should correct the observed weaknesses in present procedures and preclude excessive reliance on "skill of the trade."

The licensee is in the process of implementing the Nuclear Job Planning System (NJPS) as a work control system. The pilot system is operational and is being used for the preparation, processing and tracking of Plant Work Orders. A formal implementation of the system will be completed during early 1988 and will satisfy the latest industry initiatives in the area of work planning and control. The NJPS is being used to develop readily retrievable maintenance history records. Approximately 90% of all new work orders are being processed by the NJPS system. Large scale use of the pilot program is promoting the growth of an equipment data base which will be used to provide search and retrieval of equipment history, trend analysis, cause analysis, tracking of long lead-time spare parts and surveillance test scheduling. The initial results of the pilot program, which was begun in early 1986, are very favorable. The licensee believes that additional uses for the system will become apparent.

Eight violations were identified:

- a. Severity Level IV violation for failure to establish a procedure for installation of a Unit 3 power range nuclear instrument drawer. (250/84-39)
- b. Severity Level IV violation for failure to implement procedures to protect safety-related components from contaminants during maintenance and perform adequate housekeeping after maintenance (85-13). This violation also contained examples of failure to comply with Radiation Work Permit requirements as discussed in the Radiological Controls analysis.
- c. Severity Level IV violation for three examples of failure to properly establish/implement maintenance procedures. (85-22) Three additional procedural deficiencies contained in this violation are discussed in the Operations, Surveillance, and Outage analyses.

- d. Severity Level IV violation for three examples of failure to establish/implement adequate maintenance procedures (250/85-26). This violation also contained an example of failure to properly secure the AFW pumps after operation as discussed in the Operations analysis.
- e. Severity Level IV violation for operating clearance tagged valves during maintenance without obtaining temporary lift authorization. (86-05)
- f. Severity Level IV violation for failure to implement adequate corrective action for AFW pump turbine electronic overspeed trips. (85-30)
- g. Severity Level IV violation for failure to implement an adequate corrective action program thereby incurring repetitive AFW flow control valve failures due to water in the instrument air lines. (85-26)
- h. Severity Level V violation for performing EDG maintenance using a PW0 which had not received the required QC review and approval. (85-02)

2. Conclusion

Category: 3

Trend: Improving

3. Board Recommendation

The board recognized that the licensee management has expended a large effort to improve performance in the maintenance area.

D. Surveillance

1. Analysis

During this evaluation period, inspections were performed by the resident and regional inspection staffs. The regional inspection effort included the surveillance testing and calibration control program and the snubber surveillance program.

The quality of the surveillance area is not uniform. There is a fairly large body of surveillance activities that appear to be handled well but there are important exceptions with a severe impact. During the latter part of this SALP period the licensee had taken bold wide-ranging steps to restore uniform quality to this area but it is too early to reach conclusions on the final results.

Surveillance scheduling and implementing procedures were generally effective. Several Technical Specification surveillances, a small fraction of the surveillance actions taken, were not implemented within the required periodicities. The area affected included tritium sampling, gaseous effluent monitor sampling, snubber visual inspections, boron concentration, area radiation monitoring and fire protection systems. The discrepancies were identified, reported and promptly corrected by the licensee. These missed surveillances were not representative of a programmatic deficiency.

Implementation of surveillance procedures by the I&C Department was very effective. A reader-worker routine was effectively utilized to control and verify implementation of procedural steps. I&C Foremen, supervising the performance of safety-related surveillances in the control room, were effective in minimizing personnel errors and promoting quality work.

The snubber surveillance procedures were well-defined and stated for control of the snubber surveillance program. Decision making was usually at a level that ensured adequate management review. Records were complete, well-maintained, legible and retrievable. The resolution of technical snubber issues, such as functional test failures, was conservative, timely, technically sound and thorough.

Management control in assuring quality in the areas of Technical Specification surveillance remains a weakness, as in the last SALF evaluation. Violations (b), (e), (f), (h), (k) and (l) occurred because surveillance tests did not address or evaluate all system capabilities important to the determination of Technical Specification Operability. The important systems affected include auxiliary feedwater (two examples), power range nuclear instrumentation, intake cooling water, low pressure accumulators and main steam isolation valves. Additionally, violation (a) in the fire protection analysis documents the failure to test all required fire protection valves.

Inadequate testing of the auxiliary feedwater nitrogen system and the main steam isolation valves prevented the identification of significant systems deficiencies as described below.

- ° Prior to September 1985, the bottled nitrogen system was not periodically tested during auxiliary feedwater system operation (violation e). Therefore, the nitrogen consumption rate was not accurately known. The rate was used in selecting the nitrogen bottle low pressure warning setpoint. Subsequent surveillance testing revealed that the actual nitrogen pressure warning alarms were set so low that nitrogen depletion could have occurred prior to bottle replacement. Corrective actions were promptly implemented to correct the alarm setpoints and schedule system testing.

- ° Prior to January 1985, the main steam isolation valves were not periodically tested to verify that the valves failed closed on loss of instrument air pressure (violation l). Subsequent surveillance testing with the instrument air system isolated revealed that the main steam isolation valves would not remain closed as required for some accident scenarios. The licensee determined that this situation created the possibility of a loss of the secondary heat sink and corrective actions were implemented.

Between August and November 1985, the licensee failed to conduct adequate monthly surveillance testing on the 125 volt station batteries as required by Technical Specifications. Subsequent to the SALP period, escalated enforcement action was proposed for this violation. The licensee has implemented improved battery surveillance procedures.

The approach to the resolution of technical surveillance issues from a safety standpoint was not always thorough or timely, particularly with respect to auxiliary feedwater system testing as described below.

- ° A nitrogen system surveillance procedure, developed as a corrective action for violation (e), did not verify that the nitrogen system would function properly during actual auxiliary feedwater system operation. A fully adequate nitrogen system surveillance procedure was not implemented until eight months after issuance of the original violation.
- ° Failure to verify that open signals initiated at the auxiliary feedwater steam supply valves were received at each flow control valve resulted in violation (b). A modified surveillance procedure improved, but did not completely correct the discrepancy. A fully adequate surveillance procedure was not implemented until ten months after the initial violation was issued.
- ° There have been two instances when auxiliary feedwater system surveillance tests were considered satisfactory even though test requirements were not fully met (violations c and j).

The discrepancies and the ineffective corrective actions initially implemented for violations (a) and (b) indicated that additional management involvement in the resolution of technical issues was warranted.

The licensee has taken effective steps to preclude the occurrence of additional surveillance violations. A wide-ranging program has been established to reconstitute the design basis for safety-related systems. The design basis documents will specify required

system capabilities facilitating operability determinations. We believe the surveillance testing necessary to determine system operability will be more clearly discernable. Design basis documents are scheduled to be completed by November 1986.

An additional enhancement in resolving technical surveillance issues is made possible by the consolidation of construction and plant staff engineering activities under a single Site Engineering Manager. The centralization of the site engineering programs should improve communications and facilitate responsiveness to technical issues. The Site Engineering Manager reports directly to the Site Vice President. Creation of the position occurred in February 1986. Consequently, the full program potential was not realized prior to the end of this SALP evaluation.

Twelve violations were identified:

- a. Severity Level IV violation for failure to document or evaluate protection channel periodic test results. (84-35/36)
- b. Severity Level IV violation for failure to perform required visual observations to verify proper AWF flow control valve operation. (84-35/36)
- c. Severity Level IV violation for considering the AWF system satisfactorily tested when the pump differential pressure cell was not operating properly. (84-39/40)
- d. Severity Level IV violation for exceeding the allowed EDG voltage of 4784 volts during a surveillance. (85-02) The licensee denied this violation and the matter is being further reviewed by the NRC.
- e. Severity Level IV violation for failure to test all AWF system components (i.e., Nitrogen System). (85-02)
- f. Severity Level IV violation for an inadequate power range nuclear instrument calibration procedure. (85-06)
- g. Severity Level IV violation for an inadequate containment spray system surveillance procedure. (85-08)
- h. Severity Level IV violation for failure to perform visual inspections for evidence of structural distress or corrosion during ICW inservice testing. (85-13)
- i. Severity Level IV violation for failure to follow the procedure for calculation of Unit 3 shutdown bank "A" rod drop time measurements. (250/85-24)

- j. Severity Level IV violation for making an improper temporary change to an AFW operability verification procedure. (250/85-26)
- k. Severity Level IV violation for failure to test fail-safe valves in accordance with the ASME Code (85-05).

Violation (c) listed in the Maintenance Analysis cited a failure to perform a calorimetric instrumentation calibration at the required frequency.

2. Conclusion

Category: 2

3. Board Recommendations

None

E. Fire Protection

1. Analysis

During this assessment period, inspections of the licensee's fire protection and fire prevention program were conducted by the regional and resident inspection staffs.

In general, the management involvement and control in assuring quality in the fire protection program were adequate as evidenced by the issuance and implementation of fire protection procedures that meet the NRC requirements and guidelines. The licensee's approach to resolution of technical fire protection issues indicated an apparent understanding of the issues, and was generally sound and timely. The licensee's responses to NRC initiatives were generally timely and thorough. Fire protection related violations periodically occurred but did not indicate a programmatic breakdown. Corrective action was normally timely and effective. Licensee identified fire protection related events or discrepancies were properly analyzed, promptly reported and effectively corrected. Fire protection staff positions are identified, authorities and responsibilities are clearly defined, and personnel appear qualified for their assigned duties. However, the Site Fire Protection Supervisor's position was vacant for an extended period of time.

The licensee has issued procedures for the administrative control of fire hazards within the plant, surveillance and maintenance of the fire protection systems and equipment, and organization and training of a plant fire brigade. These procedures were reviewed and found to meet the NRC requirements and guidelines.

The staff inspections reviewed the licensee's implementation of the fire protection and administrative controls. General house-keeping and control of combustibles and flammable materials were satisfactory. The fire protection extinguishing systems, detection systems, fire barriers and barrier penetrations were found to be in service. Surveillance inspections, tests and maintenance of the fire protection systems and features were generally satisfactory. A citation was issued, however, for failure to perform the monthly fire protection surveillance in September 1985.

Organization and staffing of the plant fire brigade met the NRC guidelines. The fire brigade training program is adequately defined and implemented. The training and drills for the brigade members generally met the frequency specified by the procedures and the NRC guidelines. However, a violation was issued when the time between a number of shift drills exceeded the maximum time of three months permitted by the licensee's procedures.

The annual fire protection/prevention audit, the 24 month QA fire protection program audit by off-site organizations and the triennial audit by an outside fire protection organization required by the Technical Specifications were reviewed. These audits were conducted within the specified frequency and appeared to cover all the essential elements of the fire protection program except that the annual fire protection and loss prevention inspection and audit by qualified fire protection personnel was not conducted in 1985 (violation b). The licensee has implemented corrective actions for discrepancies identified by the audits.

The licensee identified, analyzed and reported fire prevention events and discrepancies as required by the license condition and Technical Specifications. These reports were reviewed and found to be satisfactory.

Four violations were identified:

- a. Severity Level IV violation for failure to cycle fire suppression system valves as required or verify valve positions. (85-06)
- b. Severity Level V violation for failure to conduct the annual independent fire protection and loss prevention audit and inspection by qualified fire protection personnel in 1985 as required by the Technical Specifications. (86-09)
- c. Severity Level V violation for failure to conduct fire brigade drills within the specified three months time interval between drills for all shift brigades as required by the licensee's implementing procedures. (86-09)

- d. Severity Level V violation involving the failure to conduct the monthly surveillance for the fire protection equipment in September 1985 as required by the Technical Specifications. (86-09)

2. Conclusion

Category: 2

3. Board Recommendations

No change in the NRC's inspection resources were recommended.

- F. Emergency Preparedness

1. Analysis

During the assessment period, inspections were performed by the regional and resident inspection staffs. These included observation of two annual emergency preparedness exercises, and two routine inspections.

The routine inspections and exercise evaluations disclosed that the on-site emergency organization was capable of effectively managing simulated emergencies. Adequate staffing of the emergency response facilities was demonstrated. Corporate management demonstrated a commitment to maintaining an effective emergency response program. Consistent with this commitment corporate management was directly involved in the annual exercises and critiques. Personnel assigned to the emergency organizations were cognizant of their emergency response roles, and were adequately trained in required areas of emergency response.

The one area of emergency preparedness that has detracted from the otherwise exemplary performance is the condition of the announcing system. Several high noise areas do not have good audibility and two buildings were placed in service without the system installed at the time. Though an improved surveillance and repair program has been implemented, a fully effective system has not resulted. IE Bulletin 79-18 was not met. Failures to respond to emergency grills have been caused by the mediocre announcing system.

The Emergency Response Organization's management and resolution of the postulated accident during the most recent full scale exercise demonstrated significantly improved emergency preparedness training. Prompt activation and management of the emergency response facilities was particularly notable. The transfer of emergency management from the Technical Support Center (TSC) to the Emergency Operations Facility (EOF) was decisive and prompt.

The licensee effectively used emergency action level matrices in promptly declaring each emergency classification. Protective action decision making was effectively implemented throughout the exercise. State and local government representatives assigned to the EOF were consistently factored into the off-site protective action decision making process. Consistent and effective communications with off-site agencies were maintained throughout the exercise. Additionally, public information was efficiently disseminated from the Emergency News Center.

During emergency preparedness drills and exercises the licensee identified weaknesses and required improvements; the NRC did not identify any additional weaknesses. The licensee has also been responsive to NRC initiatives regarding correction of weaknesses and program improvements identified during routine inspections, drills, and exercises.

The following essential elements for emergency response were determined to be effectively implemented: emergency classification; notification and communications; public information; shift staffing and augmentation; emergency preparedness training; dose projection and assessment; emergency worker protection; post accident measurements and instrumentation; changes to the emergency preparedness program; annual quality assurance audits of the plant and corporate emergency planning programs; and prompt revision of the Emergency Plan and procedures indicated by such audits. The exercises demonstrated that the plan and procedures could be effectively implemented in the areas of communications, accident assessment, exposure control, and recovery and reentry.

No violations or deviations were issued for any actions during the appraisal period.

2. Conclusion

Category: 1

3. Board Recommendations

No changes to the NRC's inspection resources was recommended.

G. Security and Safeguards

1. Analysis

Inspections were performed by the resident and regional staffs.

During the previous SALP period a programmatic weakness was identified in the routine maintenance of the security system. The licensee has addressed this weakness by expending additional

resources in an effort to repair and maintain aging security system components. These resources include several full-time employees dedicated to the upkeep of electronic systems and additional security measures required to compensate for failed mechanical and hardware components. A Severity Level III violation issued during this SALP period is attributable to the aging equipment and the resulting need for compensatory measures. Additionally, during this SALP period several Safeguards Event Reports were received from the licensee which reflected a repetitious failure of security hardware. During the last inspection of this SALP period it was noted that the licensee's efforts in maintaining the security-related equipment in working order have been successful. The licensee now needs to address the reliability of its current equipment, especially in light of the proposed expansion of the facility's protected area perimeter.

There was evidence of management involvement and control of the security program. Responses regarding safeguards matters were generally technically sound and consistent, demonstrating the existence of policies and procedures for control of security-related activities. Safeguards Event Reports submitted during the SALP period were timely and accurate. The security staff is considered to be adequate to implement the physical protection program. The guard force is also judged to be adequately trained and qualified.

A strength was identified in the licensee's security program in that the corporate quality assurance audit function is a continual effort throughout the year. The licensee accomplishes this continuous audit by using an independent auditor who is granted permanent unescorted vital area access and performs security audits while conducting various other ongoing audits. Records reflect that six audit reports are generated annually and that an average audit period lasts several weeks. Additionally, the security contractor rotates the Security Shift Supervisors through a three-month assignment as the Quality Assurance Captain. This results in an experienced and independent audit of random shifts to ensure regulatory compliance and procedural adherence. The security contractor also has a Compliance Records Clerk who verifies daily documentation of all required security duties and responsibilities.

Two violations were identified:

- a. Severity Level III violation for failure to take effective and timely compensatory measures during a computer outage. (85-21)
- b. Severity Level IV violation for failure to positively control access to a vital area (inadequate compensatory measures). (84-38/39)

2. Conclusion

Category: 2

3. Board Recommendations

No changes in the NRC's inspection resources were recommended.

H. Outages

1. Analysis

During this evaluation period, inspections of refueling activities, outage management, major plant modifications and post-outage startup testing were performed by the regional and resident inspection staffs. The design change program, inservice inspection and test (ISI/IST) programs, measuring and test equipment (M&TE) program, and containment integrated leaks rate testing were also reviewed by the regional staff.

Staffing, throughout refueling, met or exceeded the Technical Specification (TS) requirements. The training and qualification program contributes to an adequate understanding of the refueling process and adherence to procedures with a minimal number of personnel errors.

Defueling was performed in accordance with procedures; defueling operations were witnessed from the control room, refueling floor and spent fuel pool area.

In January 1986, during preparations for the Unit 4 defueling, the licensee discovered that the cavity seal ring did not provide a double seal as described in FPL's response to Inspection and Enforcement Bulletin (IEB) 84-03. This unexpectedly delayed the Unit 4 refueling schedule by about ten days while a temporary seal modification was fabricated. The licensee's initial response to IEB 84-03 described the reactor cavity seal configuration at Turkey Point and concluded that a catastrophic failure was not a credible event. However, it failed to adequately consider all the physical constraints of the seal configuration. After completing additional engineering reviews, FPL decided to install a backup seal for additional leakage protection. A supplemental IEB response was submitted in March 1986 for review by the Region II staff. The licensee was responsive to the NRC's request for additional information, and the modified seal design was found to be acceptable for preventing catastrophic failure. FPL plans to implement a permanent reactor cavity seal modification during the next refueling outage.

The Unit 4 refueling and Appendix R modification outage was greatly extended when it was discovered that the emergency diesel generators (EDGs) were susceptible to overloading. The full extent of the overload condition was not identified until February 1986, after Unit 4 was shutdown for a scheduled outage. The licensee determined that continued Unit 3 operation could be justified provided Unit 4 remained in cold shutdown. Consequently, the Unit 4 outage, originally scheduled to end in May 1986, has been extended until August 1986 to allow electrical load modifications which, when complete, will preclude EDG overload even while both units are operating. A number of administrative electrical load controls have also been required on Unit 4 to keep from exceeding the EDG load limit. These controls were the subject of a Confirmation of Action Letter (CAL 250, 251-86-01) issued on April 2, 1986. A subsequent regional inspection determined that these administrative controls, as implemented, were not totally effective in ensuring that EDG load limits would not be exceeded. Subsequent to the SALP period escalated enforcement action was proposed regarding these issues.

One violation (g) was identified during the Unit 3 refueling outage. It involved failure to control the lifting/handling of hafnium burnable poison assemblies in such a manner to prevent damage.

The regional inspection staff reviewed the licensee's measuring and test equipment (M&TE) program and found that M&TE activities were procedurally delineated for instrumentation and control (I&C) personnel. The I&C Department has also implemented a comprehensive training program. The Electrical Department performs limited M&TE activities; the bulk of this function for the Electrical Department is performed by off-site contractor services. One problem area was identified (violation e) relative to instrumentation exceeding calibration dates.

The design change and modification program was found to contain numerous problem areas including failures to (1) identify the major off-site organizations participating in the program, (2) procedurally delineate activities of the drawing update group (3) procedurally delineate the plant change audit program, and (4) define external organization interfaces. The licensee had identified these problems during a QA audit and corrective actions were ongoing.

The licensee has recently implemented a program to reconstitute the design basis for selected safety-related systems. The program will verify system performance and ensure consistency between the new design basis, licensing commitments and analyses and as-built drawings. The new draft design bases for all the selected systems are scheduled for issuance late in 1986. They should enhance the licensee's design change program by improving the licensee's understanding of design requirements.

Violation (f) identified several examples where nuclear safety-related system temporary modifications were initiated prior to review by the Plant Nuclear Safety Committee (PNSC). Violation (c) in the Maintenance analysis section identified an additional example of failure to comply with temporary system alteration procedures. During the 1985 Unit 3 refueling outage, a Plant Change/Modification (PC/M) involving the installation of environmentally qualified neutron flux detectors was not fully implemented. Unit 3 was started up before the flux detectors were fully operable as required by a Commission Order. Escalated enforcement action and a proposed civil penalty were issued after the end of the SALP period. These violations indicate a weakness in management control and involvement in the design change process.

Management involvement in assuring quality in the areas of ISI, IST and IE Bulletins 79-02, 79-14 and 83-06 was generally adequate. Policies were adequately stated and understood, decision making was usually at a level that ensured adequate management review, records were complete, well maintained and available, and procedures and policies were rarely violated. The inspections disclosed a weakness, however, in the licensee's responsiveness to NRC initiatives. Deadlines were sometimes missed and extensions were frequently necessary, but not always requested (e.g., IE Bulletin 83-06).

Containment integrated leak rate tests on Unit 3 (June 1985) and Unit 4 (March 1986) were witnessed by regional inspectors. Local leak rate test procedures and results were also reviewed. The inspector noted that the leak rate test program was conducted in a controlled and acceptable manner but identified some weaknesses in the integrated and local leak rate test procedures. However, no test problems were identified as a result of these weaknesses.

During the Unit 3 and 4 refueling outages the licensee, together with the reactor vendor (Westinghouse) changed out all 102 control rod guide tube split pins. The decision to replace the split pins was based on Westinghouse concerns that the pins would develop cracks such as were found at other operating reactors. The replacement was performed completely under water in each unit's refueling cavity. One cracked pin was found during the replacement.

FPL originally scheduled 27 days for the Unit 3 split pin replacement but the task was completed in 23 days, primarily due to efficient management and scheduling. FPL formed a Quality Improvement Team to critique the Unit 3 effort and identify additional improvements prior to beginning the Unit 4 refueling.

Enhancements recommended by the team included the use of an additional work station to allow alterations to continue without impacting pin installation, an improved method of maintaining water clarity, additional preplanning and preparation of work packages, and methods of reducing radiation exposure.

As a result of these efforts, the Unit 4 replacement was completed in only 18 days - without significant complications or difficulties. The use of a second work station has been adopted for future Westinghouse split pin replacements for other utilities. Total radiation exposure was reduced by 25% during the Unit 4 replacement.

Seven violations were identified:

- a. Severity Level IV violation for failure to provide acceptance criteria for thread engagement. (85-09)
- b. Severity Level IV violation for failure to include accumulator pressure relief valves in the ASME Section XI pump and valve program. (85-09)
- c. Severity Level IV violation for failure to provide appropriate acceptance criteria for an inservice testing procedure. (251/86-06) The licensee has denied this violation and the NRC is evaluating the issue.
- d. Severity Level IV violation for two examples of improperly supported safety class piping. (86-13)
- e. Severity Level IV violation for failure to establish measures to remove uncalibrated M&TE from service. (84-41/42)
- f. Severity Level IV violation for installing numerous temporary nuclear safety-related system modifications prior to Plant Nuclear Safety Committee review. (85-30)
- g. Severity Level IV violation for failure to meet quality standards while lifting hafnium burnable poison assemblies. (85-13)

Violation (c) in the Maintenance Analysis section identified an additional example of a failure to comply with the temporary system alteration procedure.

An additional apparent Severity Level III violation, with a proposed \$50,000 civil penalty, was issued after the closing date of this assessment period. It involved a failure to satisfy the

requirements of a July 15, 1985 Order with regard to the installation of neutron flux detectors under a Plant Change/Modification. (250/85-43)

2. Conclusion

Category: 2

3. Board Recommendations

No changes in the NRC's inspection resources were recommended.

I. Quality Programs and Administrative Controls Affecting Quality

1. Analysis

During this evaluation period, inspections were performed by the resident and regional inspection staffs. The following areas were reviewed by the regional inspection staff during this SALP period: quality assurance (QA) program; audits; records; document control; procurement, receipt, storage and handling of materials; off-site support staff; and the Company Nuclear Review Board.

During 1985 the NRC identified significant weaknesses in the design control program which indicated that the licensee had not exercised adequate control to ensure that changes required as a result of system modifications were appropriately translated into operating procedures, drawings, system descriptions and design basis documents. Several escalated enforcement actions were proposed subsequent to the SALP period. The AFW system and the AFW back-up nitrogen system were found, in an NRC Safety System Functional Inspection, to be susceptible to degradation and loss of safety system function. The licensee has developed and is implementing a corrective action program.

A significant weakness was noted in the implementation of the Plant Change/Modification (PC/M) program with respect to the installation and testing of new Unit 3 neutron flux monitors. The monitors were not made fully operable prior to the end of the last Unit 3 refueling outage as required by Commission Order. Erroneous quality inspector certifications of completed system testing contributed to the problem. Additionally, a letter sent to the NRC contained inaccurate statements with respect to the use of the monitors. A proposed Severity Level III violation (see the Outage Analysis) was issued subsequent to the end of the SALP period for discrepancies which occurred during the 1985 Unit 3 refueling outage. The licensee has responded requesting mitigation of the severity level and penalty. This request is under NRC review.

The quality program has not been effective in preventing an apparent breakdown in facility management controls in the areas of operations and maintenance problem identification. The program did not adequately ensure that safety-related technical issues were promptly resolved. As mentioned in the Plant Operations and Maintenance Analyses of this assessment, significant unnecessary delays occurred prior to the resolution of several issues. Many of these issues required significant NRC involvement prior to the licensee implementing effective corrective measures. The corrective measures were not initiated by the licensee's quality program.

The quality program did not ensure that chronic maintenance problems were addressed and expeditiously corrected. Long term maintenance problems have existed in the area radiation monitoring system, process radiation monitoring system and source range nuclear instrument systems.

The quality program did not ensure that the root causes of various maintenance problems, as specified in the Maintenance Analysis of this assessment, were identified and corrected. Root cause evaluations were inadequately performed for AFW stop check valve failures, water entry into the instrument air system and overspeed tripping of the AFW pumps. Consequently, corrective actions for these maintenance problems were not comprehensive in nature and the problems recurred. Additionally, the root cause identification section of numerous Plant Work Orders were not required to be filled out during maintenance activities.

A Confirmatory Order issued to FPL in July 1984 reiterated the Performance Enhancement Program (PEP) commitments outlined in correspondence from FPL to the NRC in April 1984. This program impacted existing QA activities. The following changes were either completed or in process:

- increased QA and QC staff size;
- realigned the QA and QC staff;
- increased QA personnel training;
- increased QA technical expertise (two recently hired QA employees were licensed operators);
- improved communication between QA and site personnel;
- modification of the QA reporting structure; and
- expanded QA and QC surveillance programs.

The site and corporate auditing program activities have improved since the previous SALP period. QA audits and site surveillances generally demonstrated increased depth and more substantial findings. As noted in the Outages analysis, the licensee's QA audit program is credited with finding numerous problem areas in

the design change and modification program. The audit depth weakness noted in the Health Physics area had been identified by the licensee and corrective action appears to have commenced. QA procedures and site administrative procedures were being revised to clarify and add better definition to the program. Closure of some major audit findings involving the QA records vault, snubber surveillances, and containment painting activities were lengthy and complex, but the resolutions appeared adequate.

The previous emphasis of site QA had been in the area of document review; however, the emphasis has shifted to actual work overview. Although two operations oriented personnel had been hired and training was ongoing, it was determined that additional field verification expertise would be appropriate. The licensee has restructured their QA organization to include more field verification inspectors.

The two interrelated programs, records and document control, appeared to meet regulatory requirements with one exception. Violation (i) was issued for failure to retain operating records the length of time required by the Technical Specifications. The method of storage and the fact that many records, which may have to be utilized by the plant during operation, were stored off-site made record retrieval difficult. The site QA group displayed an interest in improving the records and document control programs; several nonroutine audits were scheduled for these programs. There was a slight improvement in these programs over the previous SALP period, in that site personnel were more aware of the pertinent regulatory requirements.

Programmatic and implementing controls for procurement activities were adequate. This was due, in part, to the overall strength of the FPL procurement effort, the standardization of procurement activities, and an active QA auditing program. Several of the site's procedures have been rewritten in response to audit findings and corporate standardization.

The receipt, storage, and handling (RSH) program was generally adequate pending QA closure of some licensee - identified problems. A site construction audit, which dealt with problems in relocation to a single warehouse from a two warehouse configuration, identified deficiencies in the storage and transfer of safety-related materials. Another construction audit dealt with the program for material control from receipt to installation. The audit and corrective actions were not reviewed by the NRC prior to the end of the SALP period. Plant QC receipt inspection findings have increased dramatically since a reorganization of that group.

Violations (b) and (c) involved failures to establish specific criteria for hafnium poison insert receipt inspections and to review related nonconforming items for acceptance, rejection, repair, or rework in accordance with documented procedures.

The off-site support staff was effective in providing site support. The training of personnel appeared adequate to ensure technical competence. Interface with the on-site staff was good. Greater efficiency in providing support services was achieved by assigning off-site organizational staff to the site.

The Company Nuclear Review Board (off-site review committee) was adequate in fulfilling the function of its charter.

The licensee appeared responsive to NRC concerns, in that previously identified NRC problem areas were able to be closed upon reinspection.

Four violations were identified:

- a. Severity Level IV violation for failure to perform required triennial vendor audits. (85-34)
- b. Severity Level IV violation for failure to process nonconforming items in accordance with documented procedures (AP190.13). (85-13)
- c. Severity Level IV violation for an inadequate hafnium poison insert receipt inspection. (85-13)
- d. Severity Level V violation for failure to retain operating records the length of time required by the TS. (251/84-36)

2. Conclusion

Category: 3

Trend: Improving

3. Board Recommendations

The board recognized the fact that licensee management has expended significant effort to improve performance in this area.

J. Licensing Activities

1. Analysis

The licensee generally continues to exercise management control and overview in the licensing activity area. As stated in the previous SALP, the licensee has frequent meetings, visits and

management discussions with the NRC staff. These assist in providing a clear understanding of safety issues and the need for timely resolution. There is a reasonable balance between the licensee's resources utilized to improve plant performance/generation and the resources utilized in enhancement/improvement of overall plant safety. The licensee has implemented a reorganization, which includes a Site Vice President, increased the licensing staff and restructured the plant site engineering support staff to assure all aspects of safety considerations are included in their licensing submittals and follow-up activities. Management involvement was demonstrated in the submittals provided to resolve the pressurized thermal shock (PTS) issue for the Turkey Point reactor vessels.

Although the licensee's management continues to be strong and aggressive, licensing initiatives and activities have not received the same level of attention as during the previous SALP period. Although the decrease has been slight, it has affected the resolution of some issues such as the Technical Specifications for the reactor vessel level monitoring system and the reporting requirements per Generic Letter 83-43.

The licensee has increased the technical staff supporting the Turkey Point plant both in the engineering offices and at the plant site. Consistently sound technical justification continues to be provided for deviations from staff guidance.

The enhancement of the licensee's overall technical capability is demonstrated by their activities in the fuels area. Two Topical Reports, PWR Lattice Physics and RETRAN Code, have been submitted for NRC staff review and will be utilized at both the Turkey Point and St. Lucie facilities.

In general, the licensee's initial submittals and responses to the NRC staff's requests for information have met projected or agreed upon schedules. However, there have been some schedule slips, but in most cases, justification and revised schedules were provided. The current effort to consolidate a majority of the nuclear engineering support staff in a central location should enhance the overall efficiency of the licensing process, including the timeliness of submittals and responses.

The overall response of the licensee to NRC licensing initiatives continues to be prompt and generally complete. The licensee worked with the NRC staff to resolve a number of multi-plant and TMI items. The licensee supported several generic studies including site visits for a maintenance/surveillance study, a wrong train/wrong unit study and an Unresolved Safety Issue (USI A-451) relating to decay heat removal capability. It should also be noted that Unit 4 is included in the International Atomic Energy Agency (IAEA) Inspection Program.

The overall licensing staff is divided into three major elements. The licensing staff in Juno Beach provides the overall support for NRR licensing activities and the licensing staff in Miami provides overall support for Regional and IE activities. Both groups work closely with the licensing and compliance staff located at the plant site. The assignment of a licensed senior reactor operator to assist in licensing activities has been of great assistance. The licensing group participates in various corporate-wide training programs and provides specialized training for the licensing staff.

The licensee's overall licensing activities have been conducted in a professional and efficient manner. The effort is generally well managed and, for the most part, meets projected schedules and goals. There has been a slight overall decline in the licensing area. The major problem appears to be the extensive activities and resources necessary to respond to the problems identified in safety-related systems such as the auxiliary feedwater, component cooling water and intake cooling water systems during the licensee's Select Safety System Review effort.

However, the need for improvement has been discussed with the licensee and there appeared to be an improving trend toward the end of this SALP period.

2. Conclusion

Category: 2

3. Board Recommendations

No changes in the NRC's inspection resources were recommended.

K. Training and Qualification Effectiveness

1. Analysis

During this SALP reporting period, several routine and reactive inspections were conducted in the area of training at the Turkey Point facility. In addition, replacement and requalification examinations were conducted in February 1986. The inspections noted deficiencies in various training programs; those programs and deficiencies are discussed below as well as in the other functional area analyses, if applicable. The requalification examinations resulted in the determination that the licensed operator requalification training program was unsatisfactory.

An inspection performed as a follow-up to the Safety System Functional Inspection revealed several deficiencies in the areas of operator and maintenance training. Operator training on AFW flow balancing and operator knowledge of the Control Room

Inaccessibility Procedure were inadequate. Formal maintenance training had been discontinued for approximately 1½ years to support the INPO accreditation effort. This contributed to inadequate training on motor operated valve (MOV) maintenance and the lack of qualification cards or on-the-job training (OJT) records for the Maintenance Department. Full maintenance training, using a systematically developed approach, began in January 1986.

A routine maintenance inspection and a reactive inspection found a lack of training on newly revised procedures related to the loss of a 120 volt vital bus. The licensee committed to improve the training related to this problem through the use of on-shift training, classroom retraining, and plant modification training.

A reactive training inspection conducted in March 1986 found that operators were unfamiliar with the EOPs and their attachments generated by a Justification for Continued Operation (JCO) for the emergency diesel generators. The training that had been conducted was of a static nature instead of a walkthrough-simulation of possible events. This resulted in uncertainty on the part of the operators as to entry and exit points in the revised procedures and attachments. Further, the operator training the licensee had committed to provide on the Gamma-Metrics neutron level instruments was still not being provided to new license candidates.

A routine inspection in the areas of operator license application review and licensed operator requalification program review identified weaknesses in the administration of the requalification programs.

During this period, operator licensing replacement examinations were administered on April 30, 1985, when one (of one) reactor operator (SRO) candidate passed an oral examination, and February 3-12, 1986, when 8 of 12 reactor operator (RO) candidates, 11 of 15 SRO candidates and 0 of 1 instructor certification (IC) candidates passed the combined written and oral examinations.

Additionally, oral and written requalification examinations were given to approximately 25 percent of the licensed operators during the period of February 3-11, 1986. Of the thirteen operators examined, 0 of 4 ROs and 4 of 9 SROs passed the combined written and oral examinations, resulting in an unsatisfactory requalification training program evaluation. All license renewal applications are being held in abeyance until each licensed operator can be administered an NRC requalification examination. Subsequent requalification examinations were administered in April 1986 and an overall pass rate of approximately 60 percent was achieved. Additional examinations are scheduled for August and

December 1986, so that all licensed operators may be examined and a determination of the quality of the upgraded requalification training program can be made.

In summary, the training at the Turkey Point facility has had programmatic breakdowns. These weaknesses are a result of insufficient emphasis being placed on the training of operations and maintenance personnel even in view of commitments to the NRC for program improvements.

As discussed in the Operations analysis, a number of facility improvements are in progress at Turkey Point as part of the PEP. A new training building is currently under construction and a plant specific simulator is on order. It is projected that the simulator will be operational during the latter half of 1987.

The health physics technician and nonlicensed operator training programs achieved INPO accreditation in the Spring of 1986. The licensee plans to submit other training programs for accreditation in the future.

2. Conclusion

Category: 3

3. Board Recommendations

A continuing commitment on the part of licensee management is needed to rectify the training situation and to ensure the proper qualification of plant personnel.

V. Supporting Data and Summaries

A. Licensee Activities

During the assessment period Unit 3 was in routine commercial operations with a refueling outage from March 30 to July 17, 1985. Other outages included those discussed under Item J - Reactor Trips and: a maintenance outage from October 21 to November 6, 1985; inspection of motor-operated valves from November 30 - December 4, 1985; repair of auxiliary feedwater steam valves from January 7-15, 1986; and an outage to resolve concerns that component cooling water was not adequately balanced from March 5, 1986 to April 8, 1986.

During the assessment period Unit 4 was in routine commercial operation with a refueling outage commencing January 10, 1986 and lasting through the remaining portion of the evaluation period. Other outages included those discussed under Item J - Reactor Trips and: a shutdown from June 16-23, 1985 for Unit 3 engineered safety features testing; a shutdown from November 23 to December 1, 1985 to inspect motor-operated valves.

B. Inspection Activities

The routine inspection program was performed during this period, with special inspections conducted to augment the program as follows:

1. May 15 - June 5, 1985, in the area of independent inspection regarding an unreviewed safety question involving changes to both units' spent fuel pool cooling lineup.
2. May 22-24 and June 4, 1985, involving a physical security inspection to review the facts and circumstances surrounding two physical security events reported by the licensee in accordance with the provisions of 10 CFR 73.71(c).
3. August 1, 1985 - January 11, 1986, in the area of design changes and modifications involving the installation of environmentally qualified neutron detectors on Unit 3.
4. August 19-21, 1985, in the areas of emergency Preparedness, Emergency Response Facilities, NRC Response Team coordination, and NRC hurricane response equipment, coordination and procedures.
5. August 26-30 and September 9-13, 1985, to assess the operational readiness of the auxiliary feedwater system. This Safety System Functional Inspection (SSFI) covered maintenance, operations, surveillance, quality assurance, training, and design changes and modifications.
6. September 9 - October 10, 1985, to assess the adequacy of 10 CFR 50.59 reviews dealing with the turbine runback system modifications.
7. September 30 - October 4, 1985, in the areas of housekeeping, material identification and control and Gulfalloy supplied material.
8. November 4-22, 1985, in the areas of operation and maintenance of the auxiliary feedwater (AFW) and associated systems. This inspection was conducted as a follow-up to the Safety System Functional Inspection.
9. January 6-10, 1986, to investigate repetitive failures of the stop check valves in the steam supply system to the AFW pump turbines.
10. January 15-16 and 31, 1986, in the area of external exposure and management controls during work performed on the Unit 3 flux mapping system.
11. April 1-4, 1986, to review the Turkey Point/Florida Power and Light Company Fitness for Duty Program.

C. Licensing Activities

The basis for this appraisal was the licensee's performance in support of licensing actions that were either completed or had a significant level of activity during the rating period. These actions consisted of amendment requests, exemption requests, responses to generic letters, TMI items and other actions. The number of closed licensing actions can be summarized as follows:

Active actions at beginning of period (11/1/84)	66
Actions added during period	56
Total actions	122
Completed actions during period	64
Active actions at end of period (4/30/86)	58

The 64 actions completed during this SALP period can be divided into three major categories. The number of actions which were completed for each category are:

Plant specific actions	36
Multi-plant actions	18
TMI actions	10

1. Licensing Actions Completed During This SALP Period

- Spent Fuel Pool Expansion
- Item 4.3 - Automatic Actuation of Shunt Trip Attachment
- Off-site Dose Calculation Manual
- Masonry Wall Design - Response To IE Bulletin 80-11
- Schedule Exemption Request, Appendix R
- NUREG-0737, Item II.F.2.3, Inadequate Core Cooling Instrumentation
- ISI Relief Request
- Neutron Source Data-CY9
- NUREG-0737, Item I.D.2, Safety Parameter Display System
- Effectiveness of LWR Regulatory Requirements
- Reactor Plant Surveillance Material Program TS
- Items 4.2.1 and 4.2.2 - Preventive Maintenance Program

- NUREG-0737, Item III.D.3.4, Control Room Habitability
- Enriched Fissionable Material Limits and Surveillance
- Supplement To SE On New Data Transfer Procedure
- NUREG-0737, Item I.D.1.2, Detailed Control Room Design Review Summary Report
- Remove MOV 750 and 751 From Appendix "J" List
- NUREG-0737, Item II.K.3.30, Small Break LOCA Outline
- Item 1.1 - Post-Trip Review Program Description
- Safety Evaluation for Support of Proposed TS Changes
- Moderator Temperature Coefficient TS Change
- Control of Heavy Loads - Phase II (Followup of MPA #C-10)
- Modification of Commission Order Dated 2/23/84
- Supplementary Confirmatory Order - RG 1.97 Schedules
- Modify Commission Order Dated February 23, 1984 - SPDS
- Item 3.1.3, Post-Maintenance Testing TS, RTS Components
- Item 3.2.3, Post-Maintenance Testing TS, All Safety-Related Components
- Item 1.2, Post-Trip Review Data and Information Capability
- Parameter Selection for SPDS
- Modification of Commission Order
- Emergency Preparedness Schedule Exemption
- Steam Generator (GL 85-02) Review
- Instruments To Follow The Course of an Accident

2. NRR-Licensee Meetings

<u>Subject</u>	<u>Date</u>
Schedule Exemption Request (10 CFR 50.48) Appendix R	December 10, 1984
Technical Specifications - Conversion Program	February 4, 1985
Regulatory Requirements	March 7, 1985
Technical Specifications - Conversion Program	July 11, 1985
Integrated Living Schedules	July 25, 1985
Detailed Control Room Design Review	August 1, 1985
Pressurized Thermal Shock	October 3, 1985
Regulatory Requirements	March 7, 1986
Technical Specifications - Conversion Program	March 18, 1986

3. NRR Site Visits

Discuss Licensing Schedules and Status of Ongoing Modifications	January 29 - February 1, 1985
SALP Meeting and Site Visit	February 14-15, 1985
Performance Enhancement Program	February 21-27, 1985
Prehearing Conference and Site Visit	March 25-28, 1985
SPDS Meeting and Implementation	August 13-15, 1985
Auxiliary Feedwater Inspection	August 26-30, 1985
Auxiliary Feedwater Exit Meeting	September 12-13, 1985
Auxiliary Feedwater	October 31 - November 1, 1985
Wrong Train/Wrong Unit	November 21-22, 1985
Maintenance Survey	December 2-6, 1985
Site Visit and Status of Modifications	March 11-13, 1986

4. Commission Briefings

None

5. Schedule Extensions Granted

Modification of Commission Order Dated July 15, 1985
February 23, 1984, Extension of Schedules
for Completion of SPDS and RG 1.97

Modification of Commission Order Dated December 24, 1985
February 23, 1984, Extension of
Schedule for completion of Emergency
Operating Procedures

6. Reliefs Granted

Inservice Inspection Relief - Regenerative February 13, 1985
Heat Exchangers

Inservice Inspection Relief - Main coolant April 23, 1985
piping welds and main steam reducer to
nozzle piping welds

7. Exemptions Granted

Fire Protection - Schedule Requirements of January 4, 1985
10 CFR 50.48(c)(2), (c)(3) and (c)(4)

8. License Amendments Issued

<u>Date</u>	<u>Amendment No.</u>	<u>Subject</u>
November 21, 1984	111/105	Spent Fuel Pool Expansion
April 22, 1985	112/106	Integrated ISI Program
May 9, 1985	113/107	Deletion of Limits on Fissionable Material
June 27, 1985	114/108	Allow Breaching of Containment for Surveillance Testing
June 27, 1985	115/109	Moderator Temperature Coefficient

9. Hearings and Pre-Hearings

Hearing - Operational Limits Amendments U.S. District Court House, Miami	December 10-13, 1985
Prehearings - Spent Fuel Pool Rerack and Fuel Enrichment Amendments University of Miami Law School, Miami	March 26-28, 1985

D. Investigation and Allegation Review

No major investigations were conducted at Turkey Point during this appraisal period.

E. Escalated Enforcement Actions

1. Civil Penalties

- a. A Proposed Imposition of Civil Penalty (EA-83-138) for unauthorized entry into a locked high radiation area had been issued during the previous SALP period. On November 9, 1984, a conference was held with FPL to discuss their corrective actions and possible mitigation of the \$40,000 Civil Penalty. The NRC concluded that the Severity Level II¹ (Supplement IV) violation was valid, but that the licensee's extensive corrective actions justified complete mitigation of the associated Civil Penalty.
- b. A Notice of Violation (Severity Level III, Supplement I) and Proposed Imposition of Civil Penalty (EA-84-121) for \$25,000 was issued on February 28, 1985, for failure to satisfy the Technical Specification Limiting Condition for Operation action statement for the Unit 4 intake cooling water system. This violation, although issued during the current SALP period, was addressed in the previous SALP analysis.
- c. A Notice of Violation (Severity Level III, Supplement I) and Proposed Imposition of Civil Penalty (EA-85-80) for \$100,000 was issued on August 20, 1985, for failure to determine whether a change to the facility's spent fuel pit cooling lineup created an unreviewed safety question. FPL requested mitigation on September 19, 1985, however, an Order Imposing Civil Monetary Penalty in the amount of \$100,000 was issued on January 14, 1986.
- d. A Notice of Violation (Severity Level III, Supplement IV) and Proposed Imposition of Civil Penalty (EA-86-38) for \$50,000 was issued on April 28, 1986, for radiation exposure control problems associated with maintenance activities on the Unit 3 traversing incore probe system on January 8, 1986. The licensee's request for mitigation of the Severity Level and Civil Penalty is being evaluated.

Commission BriefingsSchedule Extensions Granted

Modification of Commission Order Dated July 15, 1985
 February 23, 1984, Extension of Schedules
 Completion of SPDS and RG 1.97

Modification of Commission Order Dated December 24, 1985
 February 23, 1984, Extension of
 Schedule for completion of Emergency
 Operating Procedures

Reliefs Granted

Service Inspection Relief - Regenerative February 13, 1985
 Exchangers

Service Inspection Relief - Main coolant April 23, 1985
 Ring welds and main steam reducer to
 Cable piping welds

Exemptions Granted

Protection - Schedule Requirements of January 4, 1985
 CFR 50.48(c)(2), (c)(3) and (c)(4)

License Amendments Issued

	<u>Amendment No.</u>	<u>Subject</u>
September 21, 1984	111/105	Spent Fuel Pool Expansion
January 22, 1985	112/106	Integrated ISI Program
March 9, 1985	113/107	Deletion of Limits on Fissionable Material
April 27, 1985	114/108	Allow Breaching of Containment for Surveillance Testing
May 27, 1985	115/109	Moderator Temperature Coefficient

- e. A proposed Severity Level III (Supplement I) violation, with an associated \$50,000 Civil Penalty, for inadequate testing and failing to satisfy an NRC Order regarding the operability of a neutron flux detector system on Unit 3 was issued on June 25, 1986.

2. Orders

- a. An order imposing a civil monetary penalty was issued on January 14, 1986, as discussed in paragraph E.1.c above.
- b. An order updating the Performance Enhancement Program was issued on August 12, 1986 subsequent to the SALP period.

F. Licensee Conferences Held During Appraisal Period

1. November 2, 1984 - Management meeting to discuss PEP progress
2. November 9, 1984 - Enforcement Conference to discuss corrective actions related to an entry into a high radiation area
3. December 7, 1984 - Management meeting to discuss PEP progress
4. December 18, 1984 - Enforcement Conference to discuss an AFW pump failure
5. February 15, 1985 - Management meeting to review SALP report
6. February 20, 1985 - Management meeting to discuss a change to the Physical Security Plan
7. February 22, 1985 - Management meeting to discuss PEP progress
8. March 28, 1985 - Enforcement Conference to discuss the containment spray system
9. April 12, 1985 - Management meeting to discuss PEP progress
10. May 23, 1985 - Management meeting to discuss PEP progress
11. June 4, 1985 - Enforcement Conference to discuss radioactive waste transportation, a security computer outage and spent fuel pool alterations

12. August 30, 1985 - Management meeting to discuss PEP progress and AFW system testing
13. September 24, 1985 - Management meeting to discuss PEP progress
14. October 9, 1985 - Enforcement Conference to discuss turbine runback system
15. November 26, 1985 - Management meeting to discuss PEP progress
16. January 8, 1986 - Enforcement Conference to discuss maintenance issues and the Gamma-Metrics neutron detectors
17. January 31, 1986 - Enforcement Conference to discuss AFW system stop check valves and the loss of high radiation area access control
18. February 25, 1986 - Management meeting to discuss the FPL health physics program
19. February 26, 1986 - Management meeting to discuss the Select System Review Milestones
20. March 7, 1986 - Management meeting to discuss PEP progress
21. March 21, 1986 - Management meeting to discuss requalification examination results, CCW flow balancing, and intake cooling water flow concerns

G. Confirmation of Action Letters (CALs)

CAL 50-250, 251-86-01 was issued on April 2, 1986, to confirm Region II's understanding of what actions would be completed by FPL prior to restarting Units 3 and 4 to ensure that emergency diesel generator loads are maintained within allowable limits.

H. Licensee Event Report Analysis

During the assessment period, 51 LERs for Unit 3 and 30 LERs for Unit 4 were analyzed. The distribution of these events by cause, as determined by the NRC staff, was as follows:

Cause	# LERs	
	Unit 3	Unit 4
Component Failure	18	15
Design	7	1
Construction, Fabrication, or Installation	1	1
Personnel		
- Operating Activity	8	3
- Maintenance Activity	4	3
- Test/Calibration Activity	9	2
- Other	2	1
Out of Calibration	-	2
Other	2	2
TOTAL	51	30

I. Enforcement Activity

UNIT SUMMARY

FUNCTIONAL AREA	NO. OF DEVIATIONS AND VIOLATIONS IN EACH SEVERITY LEVEL						
	UNIT NO.	D 3/4	V 3/4	IV 3/4	III 3/4	II 3/4	I 3/4
Plant Operations		1/1	9/8	1/1			
Radiological Controls		1/1	1/1	1/1			
Maintenance		1/1	7/5				
Surveillance		1/1	11/9				
Fire Protection		3/3	1/1				
Emergency Preparedness							
Security			1/1	1/1			
Outages			6/7	*			
Quality Programs and Administrative Controls Affecting Quality		0/1	3/3				
Licensing Activities							
Training							
TOTAL		7/8	39/35	3/3			

FACILITY SUMMARY

FUNCTIONAL AREA	NO. OF DEVIATIONS AND VIOLATIONS IN EACH SEVERITY LEVEL					
	D	V	IV	III	II	I
Plant Operations		1	12	1		
Radiological Controls		1	1	1		
Maintenance		1	7			
Surveillance		1	11			
Fire Protection		3	1			
Emergency Preparedness						
Security			1	1		
Outages			7	*		
Quality Programs and Administrative Controls Affecting Quality		1	3			
Licensing Activities						
Training						
TOTAL		8	43	3		

(*) An additional apparent violation was issued after the end of the SALP period as discussed in the Outages analysis.

J. Reactor Trips

Ten unplanned reactor trips and seven manual shutdowns occurred during this evaluation period for Unit 3. Unit 4 sustained eleven unplanned trips and six manual shutdowns. The unplanned trips are listed below.

1. Unit 3

- a. December 13, 1984 - The reactor tripped from 100 percent power due to a turbine generator trip caused by a ground in the generator exciter. The unit was placed in cold shutdown to replace the exciter, which had suffered some burned rotor windings.
- b. January 19, 1985 - A plant shutdown was in progress because of a condenser tube leak. Reactor power had been decreased below 10 percent and the anticipatory reactor trip due to a turbine trip had been blocked (permissive P-7). A slight power increase rearmed the P-7 permissive, so when the operators manually tripped the turbine a reactor trip resulted.

- c. January 29, 1985 - A reactor trip resulted from the inadvertent trip of the rod drive MG sets due to a personnel error. The turbine operator had been instructed to tag open the Unit 4 MG set output breakers, however, he entered the wrong room and opened the Unit 3 breakers instead.
- d. July 16, 1985 - A subcritical reactor trip occurred due to the loss of the "3C" vital instrument bus inverter. The loss de-energized a source range nuclear instrument causing a spurious source range high flux trip. A blown fuse was replaced and the inverter was returned to standby service. The licensee was in the process of replacing all twelve inverters in an effort to improve reliability.
- e. July 21, 1985 - The reactor tripped from 100 percent power due to a spurious protection relay actuation attributed to a lighting strike near the Unit 3 turbine deck. The auxiliary and main feedwater systems did not respond properly during the transient and a short outage followed to effect repairs.
- f. July 29, 1985 - The reactor tripped from 100 percent power during the performance of reactor protection system (RPS) testing. The cause was suspected to have been dirty relay contacts in the RPS cabinets. No specific dirty contact could be identified, but detailed system testing was satisfactorily completed prior to restarting the unit.
- g. August 1, 1985 - The reactor tripped from 32 percent power when an instrument inverter failure caused the "A" SG level to increase to the high-high level setpoint thereby tripping the main turbine and the reactor. The failed components were replaced and the inverter was returned to service.
- h. October 15, 1985 - The reactor tripped from 100 percent power when a construction worker in the cable spreading room inadvertently jarred the main transformer differential relay causing the turbine generator and, in turn, the reactor to trip. A reactor restart was delayed until auxiliary feedwater system Technical Specification operability requirements could be satisfied.
- i. November 30, 1985 - The RPS was actuated and the reactor trip breakers were opened but all the control rods had already been inserted. A source range nuclear instrument had failed to automatically energize during a plant shutdown, so the instrument fuses were removed and reinstalled to determine whether improved fuse contact would restore instrument power. The instrument did energize and the resultant pulse surge caused a false high source range flux spike which actuated the RPS.

- j. March 5, 1986 - A reactor trip occurred due to a source range instrument spike while conducting a plant shutdown. The shutdown was required because the component cooling water flow to the containment coolers could not be shown to meet design values.
2. Unit 4
- a. November 24, 1984 - The reactor tripped from 100 percent power when the "4A" 4160 volt ac bus lost its power supply, resulting in a loss of power to the "4A" reactor coolant pump (RCP) and a loss of reactor coolant flow. The loss of power was caused by a phase-to-ground fault in the "4A" RCP breaker.
- b. February 6, 1985 - The reactor tripped from 27 percent power during a startup because the "A" steam generator (SG) level was low coincident with a steam flow - feed flow mismatch for the same SG. A post-trip investigation found the steam flow channel to be reading high. The post-trip review (erroneously) stated that the steam flow transmitter had been corrected (more in the next paragraph) and the unit was restarted.
- c. February 7, 1985 - The reactor tripped from 100 percent power when the "4B" main feedwater pump de-energized due to a loss of power to the "4C" bus. The power loss resulted from protective relay action in response to an electrical fault on the "A" phase of the 240 kv switchgear. A safety injection signal was initiated during the transient as a result of a low-low reactor coolant system average temperature coincident with high steam flow indication in two channels. One channel failed high due to a blown fuse, but the second channel actuated because of a zero offset which had not been corrected after the trip discussed in the previous paragraph. No actual steam flow existed because the main steam line isolation valves had been closed earlier in the transient.
- d. May 15, 1985 - A reactor trip occurred when a construction worker bumped a relay in the safeguards relay rack while preparing to pull a cable in the area. The relay actuation initiated a turbine trip on high-high level in the "C" SG, which tripped both main feedwater pumps and isolated the SG. All systems responded normally and the unit was returned to operation later the same day.
- e. May 17, 1985 - The reactor tripped when the "C" SG registered a low level in coincidence with a feed flow - steam flow mismatch. The transient resulted from a loss of off-site power caused by brush fires north of Miami that affected the 500 kv transmission lines.

- f. May 30, 1985 - The reactor tripped on a low SG level coincident with a feed flow - steam flow mismatch. The transient was caused by the loss of a vital instrument inverter which resulted in a turbine runback. A blown fuse was replaced in the "4A" inverter but troubleshooting failed to reveal any other problems.
- g. June 6, 1985 - The reactor tripped as the result of a main turbine trip on high SG water level. A ground in a nuclear instrument channel caused a fuse in the "4C" inverter to blow resulting in a loss of automatic feedwater control. The faulty circuits were repaired and the unit was returned to power operation.
- h. June 21, 1985 - A subcritical reactor trip occurred due to the loss of the "4C" vital bus inverter. The loss de-energized one source range and one intermediate range nuclear instrument, each generating a reactor trip signal. The evaluation of this and previous inverter failures ultimately resulted in the licensee's decision to replace all the inverters.
- i. July 17, 1985 - The reactor tripped from 100 percent power due to a loss of the "4D" inverter, which caused a turbine runback and the resultant high pressurizer pressure signal. The inverter failures were recognized as a repetitive problem and the licensee was expediting their replacement.
- j. August 20, 1985 - The reactor tripped from about 30 percent power due to a turbine trip caused by a SG high water level condition. Power was initially lowered to 70 percent when a dropped rod caused a turbine runback. After the unit stabilized, a second dropped rod caused another turbine runback and the resultant SG high level turbine trip.
- k. November 23, 1985 - The reactor tripped from hot standby during shutdown due to a source range high flux trip when the source range nuclear instruments energized.