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

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License Nos.: DPR-31 and DPR-41

Facility Name: Turkey Point 3 and 4

Inspection Conducted: November 28 - December 12, 1988

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EXECUTIVE SUMMARY

This NRC inspection was conducted to assess maintenance effectiveness at the Turkey Point Nuclear Plant Units 3 and 4. It was performed by an eight-man team using guidance provided in NRC Temporary Instruction (TI) 2515/97. A special maintenance inspection logic tree used to collate and present the inspection findings is included in Appendix 6 of this report.

The inspection was performed during November and December 1988, at which time both units were in outages.

The most recent NRC Systematic Assessment of Licensee Performance (SALP) for Turkey Point which covered the period ending June 30, 1988, rated Turkey Point Maintenance as Category 3 (the poorest rating) and noted an apparent improving trend. This is consistent with the findings of the maintenance inspection team.

The Team's assessment of the effectiveness of the licensee's maintenance was that their program for maintenance was satisfactory but that its implementation was poor. The team did note an apparent improving trend stemming from changes in management's approach to maintenance and from recently instituted programmatic changes, some of which had not been fully or adequately implemented at the time of this inspection. The poor implementation rating was based primarily on the following:

(1) Historically high equipment failure rates
(2) Poor appearance of plant and equipment condition
(3) Inadequate previous allocation of resources for parts, permanent staff and especially technical support
(4) Inadequate engineering support
(5) Insufficient QC inspectors
(6) Poorly implemented work order controls and job planning (which have newly developed good programs)
(7) Inadequate procedure development
(8) Poor spare parts controls
(9) High personnel turnover rates, high overtime rates and lack of timely performance appraisals

Strong points observed included:

(1) Management is openly demonstrating their interest in improved maintenance through frequent meetings; development of a model room to demonstrate good maintenance and housekeeping; attention to correction of longstanding control room instrumentation problems; requiring verbatim compliance with procedures; setting goals and objectives for improved maintenance (personal exposure goals, mean time between equipment failure goals, etc) and monitoring with performance indicators

(2) A recently improved computerized system for work order control and planning which has excellent capabilities

(3) New management with a proven success record

(4) Overall good electrical maintenance

In the inspection four violations were identified which involved incorrect/missing equipment identification tagging (Section 1.2), failure to recognize and properly store certain minor QA records (Section 4.5 and 7.2), inadequate receipt inspection (Section 7.2), and various procedure or procedural compliance deficiency examples (Section 4.5, 5.2, 5.8, and 6.3).

A. INTRODUCTION

1.0 Scope and Objective

This inspection was conducted to assess the effectiveness of maintenance at Turkey Point Nuclear Plant (TPN) Units 3 and 4. It was performed by an eight-man team using guidance described in NRC (TI) 2515/97 (11/03/88). A special maintenance inspection logic tree developed for the NRC has been used to collate and present the inspection findings and is provided in Appendix 6 of this report.

On-site inspection was performed during November 28 - December 2 and December 12-16, 1988. Between these two periods the inspection continued in the NRC office through telephone interviews and reviews of data obtained in the first on-site inspection period.

2.0 Plant Background

The utility has four units at the Turkey Point site. Units 1 and 2 are fossil fueled units. The nuclear plant is comprised of Units 3 and 4, which are 760 MWE (net), Westinghouse, 3 loop pressurized water reactors. Unit 3 began commercial operation in December 1972 and Unit 4 in September 1973.

In recent years, Turkey Point has been of concern to the NRC because of its poor performance record. In the most recent SALP, covering the period of June 1, 1987 through June 30, 1988, the licensee's maintenance was rated Category 3, the poorest rating.

Previous NRC concerns culminated in the licensee obtaining an Independent Management Appraisal (IMA) to aid in determining how performance could be improved. The report of this IMA, which was submitted to the NRC in a letter dated April 18, 1988, identified a number of programmatic root causes of poor performance and recommended corrective actions. Many of the causes identified directly or indirectly have an adverse affect on plant maintenance, and their correction would be expected to improve plant maintenance. Subsequent to receipt of the IMA report, the NRC evaluated the IMA and provided additional recommendations in a letter, dated July 1, 1988. The maintenance inspection team members had access to the IMA related correspondence, but did not rely heavily on it as a basis for any of their rating determinations.

An INPO Evaluation inspection and Maintenance Assistance and Review Team (MART) inspection had been performed at Turkey Point. A May 1988 report of the INPO evaluation and an August 16, 1988 report describing the MART recommendations and licensee implementation plans for the MART were made available to the team during their inspection. The team did not consider the findings of these in their inspection.

3.0 Inspection Methodology

This was a performance-based inspection and, as noted in 1.0 above, it was conducted by an eight-man team. Overall plant condition, performance data, specific equipment and various maintenance-related processes were evaluated by the team through direct observations, interviews with personnel, and reviews of documentation. The selection of specific equipment for inspection was based on the following:

- Probabilistic Risk Assessment (PRA) information (obtained from a NRC generic PRA, as no plant specific PRA had been performed for Turkey Point)
- Known industry problems
- Review of licensee LERs
- Review of licensee Nonconformance Reports
- Inspectors' experience

Examples of items selected included:

- Intake Cooling Water System
- Instrument Air System
- Inverters
- Diesel Generators
- RHR Pumps and Suction Isolation Valves

In conjunction with inspections related to the selected equipment items, the team examined and evaluated maintenance associated processes identified in the NRC maintenance inspection logic tree (referred to in 1.0 above).

The NRC team was lead by Region II and was composed of five Region II inspectors and three NRR personnel. The Region II members included two mechanical/welding specialists (one the team leader), an electrical specialist, an I&C specialist and a health physics specialist. NRR members included a former senior resident inspector, a management specialist and a contractor with a mechanical background.

4.0 Presentation of Inspection Details

As noted in 1.0 above, an NRC developed maintenance inspection tree was used to collate and present the inspection findings. This tree, as completed in performing the inspection of Turkey Point maintenance, is shown in Appendix 6. The tree divides maintenance evaluation into three "parts" (I, II, and III) which are, in turn, divided into eight "areas" (1.0 through 8.0). These areas are further divided into individual maintenance topics or "elements" (1.1, 1.2, 2.1, etc.). Based on their inspection, the team established ratings for most of the elements. Subsequently, area

ratings were determined based on associated element ratings; part ratings based on the associated area ratings; and, finally, an overall maintenance rating was determined from the ratings for the parts.

Four rating categories were used and a color was assigned to each to aide in displaying the ratings on the maintenance inspection tree. The rating categories were as follows:

"Good" Performance (Green)	-	Overall, better than adequate, shows more than minimal effort; can have a few minor areas that need improvement
"Satisfactory" or "Adequate" Performance (Yellow)	-	Adequate, weaknesses may exist, could be strengthened
"Poor" Performance (Red)	-	Inadequate or missing
(Blue)	-	Not evaluated

Each part, area and element, as well as overall maintenance, is represented by a block on the tree. Most of the blocks are split into two parts with the upper portion representing program or process and the lower half representing implementation. The exception is for the part I blocks which are not considered to have separate programs or implementation.

Paragraph B, below, describes the inspection that was performed, the findings, ratings, and the conclusions for each area and element. The ratings of the parts and overall maintenance rating are the Conclusions described in Paragraph C. As already noted, the maintenance inspection tree completed through this inspection is presented in Appendix 6.

The exit interview conducted following the inspection is summarized in Paragraph D. Personnel who attended the exit interview, as well as others contacted during the inspection, are listed in Appendix 1.

B. DETAILS OF INSPECTION

1.0 Direct Measures

Rating: POOR

This area or section encompasses direct measures of plant maintenance performance. Two elements of direct measures were utilized by the NRC team in inspection and assessment of this area. They were plant historic data and walkdown inspections. These elements and details of their individual inspection and assessment are described in Subsections 1.1 and 1.2 below.

Historic data was considered to indicate marginally acceptable performance based on recent improvements. Plant equipment conditions and housekeeping observed in walkdowns were representative of inadequate maintenance.

The team consensus was that these two direct measures taken together indicated that plant maintenance was inadequate, resulting in the POOR rating stated above. While some evidence of improvement was noted, it was as yet insufficient to justify a higher rating.

1.1 Historic Data

Rating: SATISFACTORY

Scope

This element represents plant performance data as an indication of the adequacy of maintenance.

To assess maintenance through this element, a NRC team member examined the following sources of performance data:

NRC Reports:	AEOD Performance Indicators (unpublished data covering the period through the second quarter 1988)
	Licensed Operating Reactor Status Report (October 1988)
	SALP Report 50-250,251/88-15 covering the period from June 2 , 1987 through June 30, 1988
Licensee Reports:	Florida Power & Light Company (FP&L) Comparative Performance Indicator Report
	Licensee Event Reports
	Monthly Operational Reports
	Monitoring and Trend Reports

Findings

For data reported through June 1988, most major maintenance related performance indicators showed both Turkey Point units to have performance worse than the industry averages. Examples from licensee data are as follows:

Indicator	Turkey Point Values		Industry Mean
	Unit 3	Unit 4	
Forced Outage	52%	32%	5%
Maintenance Radiation Exposure (mr/unit/yr)	498	198	163
Industrial Safety Lost Time Accident Rate	0.69	0.69	0.19
Out of Service Control Room Instruments (Avg./unit)	72	66	20

AEOD data on automatic scrams while critical, safety system actuations, significant events, safety system failures, forced outage rate and equipment forced outage rate/1000 critical hours indicated generally improving trends for both units. The values for these indicators differed significantly from those for other older plants only for forced outage rate on both units and for equipment forced outages/1000 hours critical on Unit 3. In these instances Turkey Point's values were significantly worse than those for the other older plants.

Recent licensee data has indicated improving trends with personnel exposures close to the industry average, mean time between failures (of equipment that causes a forced outage) increased and the control room deficiency tag backlog reduced.

The licensee is placing particularly strong emphasis on mean time between failures (MTBF) as an indicator of plant and system reliability and of good maintenance. Documentation presented to the team by the licensee shows that similar plants (Westinghouse 3-loop) have a MTBF of 27 days, whereas TPN has averaged 19 days from 1973 through 1987 (Reference 9/30/88 FP&L interoffice memorandum from J. Donis to F. Southworth). TPN MTBF data shown to the NRC team at their entrance meeting indicated that the TPN 1988 MTBF had improved to about 50 days. This occurred when Unit 3 managed a sustained run of 185 days - its longest ever. At the end of this run Unit 3 was shut down for equipment problems whose correction necessitated months of shutdown.

While additional time and data is needed to confirm the improving MTBF and other trends referred to above for TPN, the NRC team found that management attention and attitudes appear strongly directed toward improvement and that they are closely monitoring indicators to assure continuing improvement.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) Improvement in MTBF for 1988 to about 50 days for TPN as compared to the TPN average of 19 days and industry average of 27 days for similar plants.

(2) Personnel exposures appeared to have improved significantly in the last half of 1988.

Weaknesses (Based on Data through June 1988)

(1) High forced outage rate (6 to 10 times industry mean)

(2) High personnel exposures historically (recent significant improvements indicated are referred to as an apparent strength above).

(3) Excessive out of service control room instruments (over 3 times the industry mean)

Conclusions

Past data from maintenance-related performance indicators was judged to have indicated poor maintenance. However, it appears that recent management attention has resulted in improvement. The consensus of the team was that, on the basis of the recent improvements, this element should be rated SATISFACTORY. This is an expression of the team's optimism that recent improvements observed in the performance indicators will be confirmed in future data points.

1.2 Plant Walkdown Inspection

Rating: POOR

Scope

This element of the inspection encompasses overall plant housekeeping and equipment condition as determined through plant walkdowns.

The inspectors each conducted several tours of plant areas, and their observations during these tours are the principle source of information for rating this element. The data obtained in these tours was supplemented through discussions with licensee personnel,

review of licensee personnel entry data (for the containment and Radiation Controlled Area (RCA)) and a general review of the nonconformance report (NCR) listing. Personnel interviewed included the Maintenance Manager, the three planning supervisors, and various craft and system engineering personnel. Examples of NCRs reviewed are listed in 3.4 and 6.3. Significant personnel entry data obtained is summarized in Appendix 3. The personnel entry data was used to determine how frequently licensee supervisory and engineering personnel entered and observed conditions in the RCA and containments.

Findings

Numerous apparent housekeeping and equipment maintenance deficiencies were observed by the team. Examples are given in Appendix 4. Most of the deficiencies observed appear, individually, to be of minor significance, but should be reviewed by the licensee to assure this is the case. Overall, they were perceived to represent poor maintenance and housekeeping practices.

Among the more significant deficient conditions observed were missing and incorrect identification tags for Unit 3 RHR cold leg suction isolation valves 751 and 750. Because there has been a long-standing recognized problem with equipment identification that has led to operational and maintenance errors, this matter represents a lack of prompt licensee corrective action. It is being identified as Violation 250,251/88-32-01, Lack of Prompt Action to Correct Equipment Identification Deficiencies. Recent examples of operational and maintenance problems stemming from deficient equipment identification included an instance of incorrect work order cancellation that was, in part, due to missing instrument identification (described in Appendix 4(22) below); and a significant event (reactor coolant leakage in excess of 50 gpm on January 7, 1989) that resulted when an unlabeled RHR discharge drain line valve was not closed.

Past equipment identification deficiencies were referred to in the SALP ended May 31, 1987 and more recently in NRC Inspection Report 50-250,251/88-34. Further, equipment identification concerns were to have been corrected through the licensee's Performance Enhancement Program, Project 2, Task 4 (Reference, e.g., September 30, 1987, letter from FP&L to NRC).

From a positive standpoint, the NRC inspectors noted the "model room" concept that management has created to demonstrate their expectations of good plant and equipment conditions which maintenance personnel are expected to achieve in their work.

Both from discussions with workers while conducting their tours and from the RCA and containment entry data presented in Appendix 3, the inspectors found that licensee supervisory and system engineering personnel were seldom observing work or plant conditions in important plant areas (i.e., the RCA and containments).

STRENGTH AND WEAKNESSES IDENTIFIED FOR ELEMENT

Strength

The creation of "model" room concept to communicate, by example, the desired good equipment and housekeeping conditions.

Weaknesses

(1) The generally unsatisfactory equipment and housekeeping conditions that now exist in the plant.

(2) Long-standing inadequate equipment identification tagging

(3) Evidence of insufficient worker pride or "ownership" interest in the condition of plant and equipment, as indicated by evidence of unsatisfactory maintenance practices and the presence of grafitti.

(4) Insufficient/infrequent licensee supervisory and system engineer walkdowns to assess plant conditions.

Conclusions

The licensee appears to be taking generally appropriate actions to improve plant housekeeping and equipment conditions. However, it was the consensus of the team that the current plant housekeeping and equipment conditions are inadequate and a POOR rating is designated for this element.

2.0 Management Commitment and Involvement

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

This area encompasses the emphasis that upper management places on supporting and being involved with the maintenance process and, especially, their support for involvement in various nuclear industry programs and initiatives.

The team found that plant management is very active in support of the maintenance process and that there is evidence of some promotion of involvement in industry programs and initiatives.

2.1 Application of Industry Initiatives

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses upper management support for application of industry initiatives. The initiatives referred to include INPO initiatives, owners group and EPRI programs, NUMARC initiatives and industry-wide reports of generic plant, and equipment problems.

The element was inspected primarily through reviews of reports referred to below and interviews with the Maintenance Superintendent, Assistant Superintendent of Electrical Maintenance and the INPO Coordinator.

Findings

The team's findings for the specific initiatives addressed in the inspection are described under initiative headings below.

INPO Self Assessment, MART, and Evaluation Inspections:

From interviews, the team determined that the licensee had performed a Self Assessment, and that a MART inspection and INPO Evaluation had been conducted within the past year. They reviewed the Self Assessment Report, the INPO Evaluation report, and a report of MART Recommendations and related licensee responses. In addition, the team interviewed the INPO coordinator who is responsible for tracking associated commitment completions and verified a tracking report maintained by the coordinator.

INPO Motor Operated Valve (MOV) Initiative:

From discussion with management, the team understood that the licensee was not involved in this initiative. Further, the team was informed that the maintenance engineer who had been responsible for MOV problems had recently left and had not, as yet, been replaced.

In response to questioning, the team was informed that licensee activities to address NRC Bulletin 85-03 identified valve problems were limited to the valves for which the Bulletin requested action and to troubleshooting. The team was informed that the plant had requested corporate engineering to provide thrust values for all of their MOVs about 2 years previously, but that they had not generally been provided. For a few problem valves, thrust values had been specifically requested and obtained. In his review of the licensee's MART report the inspector noted that the licensee was proposing to establish a MOV program with a target date of January 1989.

Air System Problems:

As discussed in Section 4.1 below, the licensee's responsiveness to instrument air system problems appeared unsatisfactory. This is an indication of a lack of management commitment and attention to an important NRC identified problem area.

INPO Plant Performance Goals:

From an interview with the maintenance manager and a review of a 1988 Mid-Year Report of INPO Industry-Wide Nuclear Power Plant Performance Indicators; the team verified that the licensee had agreed to goals for performance and was actively tracking these goals.

EPRI Reliability Based Maintenance Study:

The team found that the licensee had been one of the main participants in the subject EPRI study. Interviews with management indicated that reliability-based maintenance concepts from the study were not considered useful and were not being employed at Turkey Point.

NRC Information Notices (INs):

The team examined the licensee program established to assure NRC Information Notices were acted on where appropriate. In addition, they checked to determine if the licensee had adequately responded to information provided in the following:

IN	FP&L NO.	Brief Description
86-62	86-098	Molded-case breaker shunt trips
87-41	88-134S1	Circuit breakers by Brown-Boveri Co.
87-66	88-004	Commercial grade relays by Agastat Co.
88-14	88-36	HFA type relays
88-42	88-134S2	Charging spring motor mounting
88-44	88-072S1	Circuit breaker spring release device
88-46	88-73	Defective refurbished circuit breakers
88-57	88-088	SCR failure
88-69	88-98	Finger binding in HFA type relays

Review of documentation from these files indicated that appropriate action had been taken for each of the information notices. This indicated that the licensee had developed a satisfactory system for addressing INs.

STRENGTHS AND WEAKNESSES IDENTIFIED

Strengths

Management appeared to have instituted a well implemented program for addressing concerns described in electrical-related NRC Information Notices

Weakness

Management has been slow in fully responding to the extensive NRC concerns for air systems and MOVs.

Conclusions

Although licensee management has clearly been active in support of a number of industry initiatives, the responses that resulted to MOV and Air Systems problem initiatives appeared inadequate to the team.

Taking into account the overall support that management appears to have provided for the initiatives and that action was already scheduled for better addressing MOV problems, the licensee is rated SATISFACTORY for both their program and implementation with regard to this element.

2.2 Management Vigor and Example

Rating:

Program: GOOD

Implementation: SATISFACTORY

Scope

This element encompasses management's interest and participation in a continuing assessment and improvement of plant maintenance.

The team evaluated this element by examining management awareness of and involvement in the following matters:

- Plant aging
- Self assessment using performance indicators
- Training in maintenance
- Periodic maintenance program review and updating
- Feedback to organizations involving maintenance
- Actions demonstrating top management's involvement in maintenance policies
- Development, implementation, and enforcement of maintenance policies
- Databases used and their goals and effectiveness

The examination of the element was accomplished through observation of licensee meetings, interviews with various levels of licensee personnel and review of documentation. The documented sources of information are identified in the Appendix and/or in the Findings described below. Persons interviewed are included in Appendix 1. Meetings attended are identified in the Findings below.

Findings

During the past year, a new Plant Manager, with the support of the Site Vice President and corporate level management, has undertaken actions intended to improve the performance culture of TPN.

Personnel:

Management is aware of plant maintenance problems and is vigorously implementing activities to improve its maintenance systems and approach. To this end the Plant Manager has instituted management actions directed at strict adherence to procedures, strict individual accountability, improvement of communications and team work, encouragement of individual and group reward mechanisms for work well performed, root cause evaluation, and management exposure to plant operations.

The recent emphasis on improved managerial effectiveness has been a result of various outside evaluations (INPO, IMA, NRC) conducted within the plant during the past few years and a recent (September 1988) plant self-evaluation. In May 1988 a new plant manager was employed at TPN who brought with him many years of experience in the nuclear industry including experience at INPO and at other plants. In August 1988 a new Assistant Maintenance Superintendent was hired who also has many years of experience in the maintenance of nuclear power plants and experience with INPO activities. These two individuals have brought to the management family significant industry experience. This is an important factor since the other top managerial positions related to maintenance are held by employees who have had a long term work history with Turkey Point and FP&L, and in some cases, an exclusive work history with Turkey Point. The Plant Manager and the Site Vice President indicated they intend to make TPN maintenance management more knowledgeable of maintenance operations utilized elsewhere in the nuclear industry. This will be accomplished by, for example, loaning key managers to INPO for extended periods of time. The loaned manager will have an opportunity to audit other plants, learning about and evaluating both successful and unsuccessful industry maintenance operations.

Compliance with procedures:

One of the corner stones of the Plant Manager's program is strict compliance to procedures. In the past, as noted in numerous INPO and NRC documents, plant management did not adequately enforce strict compliance with procedures. In fact, these reports have indicated a need for new and/or updated procedures, especially related to maintenance. Plant management itself indicated that they had come to similar conclusions but had not been as proactive in this area as was desirable. Recently, new plant maintenance policy and procedures have been created and others have been updated. All employees have been notified of the new commitment to strict adherence through a series of meetings (some conducted by the site Vice President, Plant Manager and by the Superintendent of Maintenance). Attendance at one of these meetings during the NRC inspection process revealed a high level of interaction between management and the 35 employees in attendance. At this meeting the Plant Maintenance Superintendent distributed the new Conduct of Maintenance Policy and explained clearly to all employees FP&L/TPN policy regarding strict adherence to procedures, why there is a need for strict adherence, and the advantages and disadvantages to following the policy. He also explained the roles of management and line employees in regard to the maintenance function and how the maintenance function interfaces with the Operations Department. There was open discussion regarding specific indicators for tracking performance and how each level of employee is responsible for achieving the goals established to fulfill the indicator. The Maintenance Superintendent recognized plant staff (journeymen, foreman, and higher levels) for their efforts in improving maintenance indicators. This meeting was found to be an example of management commitment as exhibited by the level of detail discussed related to explaining FP&L/TPN policy and the commitment by top management to spend the time necessary so everyone in attendance had an opportunity to participate and clarify for themselves the meaning of the new maintenance policy.

Model room:

Another way management indicated its vigor was through the establishment of a "model room" as referred to previously in 1.2 above. This room was found to be well maintained, clean, freshly painted, exhibited good housekeeping, etc. It was designed to show maintenance employees not only what management expectations are but also their ability to do good work, as the model room was created by TPN personnel. The team considered this the model room concept an excellent effort which should be expanded to other parts of the plant.

Plant visits:

In order to bring a managerial presence to plant activities and to continually keep upper level management aware of plant activities, on October 13, 1988, the Plant Manager issued a memorandum to the various plant department heads, indicating that they were expected to spend at least two hours each day in the plant, walking around conducting site inspections and visits. Previous to this period there was an indication that management had not spent sufficient time observing actual plant conditions or performing "walkdowns". Management considers such site visits to be beneficial not only for the managers understanding of plant conditions but also as a means of improving the communication between management and plant operating personnel.

A review of the RCA inplant entry log for the Maintenance Superintendent indicated that from October 24 to November 26 he made eleven visits, out of a possible 29 days since the new policy directive. Although the team had no data related to his entering other parts of the plant outside containment, it was apparent that the Maintenance Superintendent had been recently entering important plant area on a regular basis.

The team noted, however, that most supervisory personnel did not appear to be entering important work areas such as the containments and RCA as previously referred to in 1.2 above and denoted in Appendix 3.

Quality Improvement Program:

The Quality Improvement Program (QIP) is a corporate-wide managerial approach designed to improve overall quality in managerial activities of FP&L/TPN.

The QIP consists of three internal processes: Policy Deployment, Quality in Daily Work, and Quality Improvement Teams. Through the QIP process plant management develops activities designed to foster clearly defined goals/objectives, accountability for work performed, and an environment for employees to work together toward achieving excellence throughout the plant.

Summary:

Management appears aware of plant maintenance problems and is vigorously implementing activities to correct these maintenance problems. The Plant Manager has encouraged activities to redirect the maintenance staff in the following areas: establishment of standards and expectations for good quality maintenance; strict compliance with procedures; craftsmanship; improved housekeeping; development of a model room; root cause analysis; establishment of performance indicators.

Management has established a variety of managerial structures to encourage improved maintenance by all employees and modify the culture of the organization. These structures consist of establishment of the alue of strict compliance to procedures and improved maintenance of the plant, strict accountability for work performed by individuals, improved decision making procedures through the QIP system, improved communication patterns through direct communication and awareness of plant activities with plant line employees and management; redefined reporting relationships and clarification of managerial and employee roles through written performance objectives and maintenance policy manuals, and finally a reward and punishment system which encourages employees to improve their performance.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR ELEMENT

Strengths

(1) Management's policy and program directed at strict adherence to procedures and strict individual accountability.

(2) Management initiatives directed at improvement of communications and team work; encouragement of individual and group reward mechanisms for work well performed; root cause evaluation; and management exposure to plant operations indicate a vigorous approach toward solving plant maintenance problems.

(3) Management has taken the approach of not establishing "availability goals" in order to place more emphasis on maintenance and meeting safety requirements. Management communication of this was corroborated by the team with craft employees, foreman, and lower level supervisors.

(4) The QIP system as a unifying mechanism for managerial planning, performance indicators, root cause analysis, performance appraisal, and rewards.

(5) The number and variety of performance indicators which provide a tracking system and historical perspective to plant maintenance activities. Such wide spread use of performance indicators provides feedback to employees of plant status and accomplishment of work goals.

(6) The model room concept.

(7) The new computerized Nuclear Job Planning System instituted by management is bringing plant maintenance activities under one database system.

Weaknesses

(1) The team found questionable the method by which new or revised procedures are tested/validated. There appears to be a problem of communication and feedback between procedure writers and plant craft maintenance personnel in the interpretation of procedures which results in many On the Spot Changes (OTSC), stop work orders, and rework. In light of the policy of strict adherence to procedures and the threat of disciplinary action for not complying, the team considers that management needs to take further steps to improve the process by which the organization develops, tests/validates, approves, and issues maintenance procedures.

(2) Management has not been observing activities being undertaken in radiation areas and are not likely to be directly aware of conditions in these areas.

Conclusions

Management appeared vigorous in their approach to improving plant maintenance and the team considered that their program for accomplishing improvement was well defined. Actual implementation exhibited some problems or WEAKNESS as described above, but the team still considered it adequate. The consensus of the team was that, for this element, the program was rated GOOD and the implementation SATISFACTORY.

3.0 Management Organization and Administration

Rating:

Program: SATISFACTORY

Implementation: POOR

This area encompasses the support for maintenance activities provided by corporate and plant management.

The team consensus was that management's program for support of maintenance was SATISFACTORY, but that current evidence did not indicate SATISFACTORY implementation. The implementation results observed largely stemmed from a previous program and were determined to represent POOR maintenance support by management.

3.1 Identify Program Coverage for Maintenance

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope

This element encompasses the plan which management has developed to assure that adequate maintenance coverage will be provided through their maintenance program.

Findings and Conclusions

This element was not inspected or assessed, either directly or indirectly by the NRC maintenance inspection team.

3.2 Establish Policy, Goals and Objectives for Maintenance

Rating:

Program: GOOD

Implementation: SATISFACTORY

Scope

This element encompasses the maintenance policy, goals, and objectives established by management.

The element was inspected through the review of documentation noted below and interviews with personnel who are included in the listing in Appendix 1.

Findings

The current FP&L corporate vision statement is:

During the next decade we want to become the best managed electric utility in the United States and an excellent company overall and be recognized as such.

The current Nuclear Energy Department vision statement is:

To become and be recognized as the safest, best performing nuclear utility, through teamwork and commitment to excellence.

The Turkey Point Plant mission is:

Provide efficient, reliable electric power to our customer system operations in accordance with county, state, and federal regulations with the highest emphasis on public safety.

The Conduct of Maintenance Policy mission statement is:

Maintenance has a primary role in ensuring the safe and reliable operation of a nuclear power generating station. That role is to maintain plant equipment in its design operable condition. In order to effectively support this role high standards, controls, and expectations must be established with regard to the conduct of maintenance. Achievement of excellence in maintenance requires a team effort and a dedicated commitment to raising standards ... Maintenance department personnel are accountable for ensuring that maintenance activities are performed in a quality professional manner within the requirements of plant policies and procedures.

These vision and mission statements have been included in the Plant Manager accountabilities and the Maintenance Superintendent accountabilities. These have been further translated and made more specific in the Maintenance Department Business Plan (the performance evaluation basis of the Maintenance Superintendent and his staff).

A review of the business plans of both the Plant Manager and the Maintenance Superintendent indicated agreement with overall plant goals and internal consistency with each higher level plan. Lower level business plans, which were partially reviewed, indicated clear communication of goals to lower level managers. A review of position descriptions of managerial personnel indicated that the direction proposed by these statements are reflected in their work responsibilities. A review of the Conduct of Maintenance Policy indicated consistency with corporate policy and the business plan of

top managerial officials. This shows internal and external consistency and communication of goals, objectives and values. Such consistency encourages overall accountability and establishment of work priorities within the maintenance department.

Awareness:

The goals and accountabilities of the Plant Manager and of the Maintenance Superintendent have been communicated to line employees and supervisors at periodic staff meetings. The NRC team attended two meetings. One meeting was between the Plant Manager and members of the Reactor Operations staff. At this meeting the goals and objectives of the plant were discussed with an emphasis made toward following procedures. Two way communications were encouraged and a free, frank and open discussion occurred. The other meeting was between the Maintenance Superintendent and about 35 members of the maintenance staff during which the maintenance Superintendent explained the Conduct of Maintenance Policy. A description of this meeting can be found under 2.2, Management Vigor.

The team believes the systems for establishing policy, goals, and objectives for maintenance are well defined and are being implemented on the upper-level management level in a fashion which encourages employees to not only know what those objectives, goals and policies are but to receive periodic and direct feedback on results. Discussions with plant personnel, journeymen, foreman, and craft supervisors, indicated that individuals were generally aware of the expressed goals and objectives of plant management. They indicated that they had met with the Plant Vice President, Plant Manager, and Maintenance Superintendent at different times where such policies were explained. Based on the interviews, however, the team had some doubt that either the line supervisors or lower level staff are fully conversant in the policy, goals and objectives of management despite management's efforts to communicate policy to them.

Performance indicators:

The Plant Manager and Maintenance Superintendent as well as lower level managers have performance indicators for most of their major accountabilities. These are monitored on a monthly basis (if not more often) and corrections are made as appropriate. Performance indicators are shared with plant personnel by posting them prominently and publicly. The above is consistent with the corporate Quality in Daily Work System, a planning and tracking system developed by corporate level management.

Update:

During the past several months much work had been performed to update operating policies and procedures. The Plant Manager stated that updating policy and procedures was one of his major thrusts. A sample review of policies and procedures showed considerable effort

in this area. Of ten administrative policies and procedures manuals reviewed, only one (ADM 210 dated 11/3/88) was currently in draft form. Eight Administrative Manuals were developed and/or revised since January 1988 and one Maintenance Instruction (MI 700) was approved 11/7/88. See below for listing of items reviewed.

Administrative and Maintenance Procedures/Policies Date of Approval

ADM 031	Independent Verification Policy 8/31/88
ADM 019	Management on Shift Policy 1/7/88
ADM 501	Duties & Responsibilities of Systems Engineers 1/15/88
ADM 706	Predictive Maintenance Program 4/26/88
ADM 705	Guidelines for the Analytical Based Preventive Maintenance Program 8/2/88
ADM 701	Plant Work Order Preparation 10/26/88
ADM 714	Conduct of Maintenance Training 1/26/88
ADM 715	Maintenance Procedure Usage 10/21/88
MI 700	Conduct of Maintenance 11/7/88
ADM 210	DRAFT Plant Work Coordination 11/3/88

Maintenance Superintendent goals:

Interview with the Maintenance Superintendent revealed four major thrusts in his area:

(1) Provide additional training in the maintenance area.

(2) Establishing computerized job bank in which qualifications for each worker can be compared with the type of worker needed for the particular job.

(3) Procedures development.

(4) Develop a new "concept" of maintenance. One in which maintenance is important to the plant and that working in maintenance is important and useful.

STRENGTHS AND WEAKNESSES

Strengths

(1) The Plant Manager and Maintenance Superintendent, as well as lower level managers, had performance indicators for most of their major accountabilities. These were monitored on a monthly basis (if not more often) and corrections were made as appropriate.

(2) The performance indicators were prominently and publicly posted within each department's work area.

Weakness

Incomplete knowledge of plant policy and procedures at the craft level, despite management efforts to communicate such policy through formal meetings.

Note: This leads the team to question the adequacy of supervisors/foreman communicating such policies to lower level staff or to the extent supervisors/foreman are fully conversant in the policy, goals and objectives of management.

Conclusions

The team considered the systems for establishing policy, goals, and objectives for maintenance to be well defined and codified in various current manuals and instructions. Techniques were in place for communicating both corporate and plant policy, goals, and objectives. However, the team believes implementation of these techniques should be strengthened so that all levels of employee are made more fully aware. As a result, it was the consensus of the team that the program for this element be rated GOOD and its implementation rated SATISFACTORY.

3.3 Allocation of Resources

Rating:

Program: POOR

Implementation: POOR

Scope

This element encompasses management's allocation of resources to assure proper accomplishment of maintenance. The following were considered:

- Excessive use of contractors
- Delays resulting from understaffing
- Excessive use of overtime
- Delays resulting from unavailability of materials
- Delays resulting from inadequate engineering support

Inspection of this element was accomplished through interviews with licensee personnel and reviews of documentation. Often, the information obtained and assessed resulted in findings that, at least in part, applied to other elements. For example, inadequate engineering support can be largely attributed to failure to allocate needed resources for obtaining sufficient engineering support.

Findings

Although it appeared that the licensee was beginning to allocate sufficient resources to maintenance, evidence indicated that, at least in the recent past, their program had not provided sufficient resources and that maintenance had not been adequately supported. NRC inspection of this element did not address certain items which appeared to be benefitting from application of additional resources - as for example new training facilities, a new maintenance building, etc. Specific items identified as apparent STRENGTHS and WEAKNESSES relative to the licensee's resource allocation are listed below.

STRENGTHS AND WEAKNESSES FOR THIS ELEMENT

Strengths

(1) The current (recently upgraded) database system that supports maintenance.

(2) An apparently expanding preventive and predictive maintenance program.

(3) Recently contracted engineering to correct control room problem equipment.

Weaknesses

(1) Excessive overtime for QC inspectors (estimated 50% on the average) (Refer to 4.2).

(2) Excessive use of contractors for Health Physics (HP) and Systems Engineering support functions (Refer to 4.2 and 4.5)

(3) Insufficient engineering support and QC inspectors (Refer to 4.2 and 4.4).

(4) Delays due to parts unavailability (Refer to 7.2).

Conclusions

The NRC inspectors concluded that while it appeared that allocation of resources was beginning to improve, the WEAKNESSES currently observed indicated inadequate or POOR allocation of resources both in program and implementation.

3.4 Definition of Maintenance Requirements

Rating:

Program: GOOD

Implementation: GOOD

Scope and Findings

This element encompasses definition and implementation of all important aspects of the maintenance process, with provisions for incorporating modifications and changes needed for continuing development and improvement.

This element was inspected by examining procedures as well as a random sample of documentation associated with maintenance activities.

The following procedures were examined:

O-ADM-500 -	Control and Use of Vendor Manuals
O-ADM-501 -	Duties and Responsibilities of System Engineers
O-ADM-502 -	In-Service Testing (IST) Program
O-ADM-701 -	Plant Work Order Preparation
O-ADM-703 -	10 CFR 50.49 Environmental Qualifications
O-ADM-704 -	Environmental Qualification Maintenance Index
O-ADM-705 -	Guideline for the Analytical Band Preventive Maintenance
O-ADM-706 -	Predictive Maintenance Program
O-ADM-708 -	Maintenance Department PC/M Guidelines
O-ADM-709 -	Equipment Lubrication Guide
O-ADM-710 -	Processing, Scheduling, and Upgrading Preventive Maintenance Procedures
O-ADM-711 -	Vibration monitoring
O-ADM-712 -	Lubricating Oil Sample Processing
O-ADM-716 -	Infrared Thermography

The above procedures establish that the following activities have been included in the TPN maintenance program.

- EQ required
- Preventive
- Corrective
- Emergency
- Predictive
- Diagnostic exam
- Surveillance testing
- ISI required
- Modifications

A random sample of Plant Work Orders (PWOs) was examined to verify that they were properly coded as corrective maintenance. PWOs examined were as follows:

PWO No.	Work Performed
WA 871680805	Replaced broken set rod and reset limit switch on operator for MOV-4-749A
WA 871800859	Disconnected and reconnected operator to support mechanical maintenance on MOV-4-749B
WA 880640951	Troubleshoot and correct MOV-3-749A (valve will not open fully)
WA 880502074504	Adjust rotor on limit switch for MOV-4-750 for proper shutdown indication
WA 880171945	Troubleshoot and repair operator for MOV-3-863A (valve failed to close)
WA 872831401	Assist Electrical Department in troubleshooting and repairing operator for MOV-3-869
WA 871480057	Troubleshoot and repair mechanical indicator for MOV-3-866B (Indicator giving false reading; 50% when handwheel at lock)
WA 871731248	Troubleshoot and repair operator for AFW Turbine Trip and Throttle valve MOV-6459C

A random sample of PWOs was examined to verify that they were properly coded as preventive maintenance. PWOs examined were as follows:

PWO No.	Work Performed
WA 881130837	General inspection and lubrication of operator for MOV-4-350
WA 871550901	Performed EQ inspection of operator for MOV-4-6386
WA 880502073931	MOVATS testing of valve MOV-4-751
WA 871550857	EQ inspection of MOV-744B
WA 871550859	EQ inspection of MOV-744B
WA 881130907	General inspection and lubrication of valve MOV-4-860B
WA 881130913	General inspection and lubrication of operator for MOV-4-863A
WA 881130927	General inspection and lubrication of operator for MOV-4-863B
WA 881130940	General inspection and lubrication of operator for MOV-4-872
WA 871550826	EQ inspection of operator for MOV-4-866A
WA 881130850	General inspection and lubrication of operator for MOV-4-843A
WA 881130856	General inspection and lubrication of operator for valve MOV-4-843B
WA 881130935	General inspection and lubrication of operator for valve MOV-4-869

A random sample of nonconformance reports (NCRs) together with attendant documentation was examined to verify that related maintenance activities reflected requirements from the following:

- Vendor's technical manuals
- Vendor's Notices, Bulletins, Letters
- Technical Specifications
- EQ documents
- Engineering analyses
- Maintenance history

NCRs examined were as follows:

NO.	Item
88-0048	Improper bolting for replacement TPCW HX channel heads
88-0059	Valves of improper material of TPCW Hxs
87-0082	Damaged IAS line
88-0119	AFW Train 1 IAS supply check valve problems
87-0125	4C ICW Pump discharge check valve binding
88-0104	Installed gages not IAW Instrument Index
88-0117	ICW valve 4-50-331 with broken spring end wear indications
87-0026	EDG PI-3667A not listed on Q List
87-0032	"A" EDG oil transfer pump cracked stuffing box extension
87-0165	Polar crane main hook wire rope below minimum diameter
87-0003	CCW Solenoid valves differ from instrument index
87-0183	Leaking containment cooler CCW drain valve 10-053
88-0063	Gouge in CCW header to "A" RHR HX
87-0055	RCS RTDs not purchased EQ (P073500-99779W)
87-0136	Flange deformation on PZR Spray valve 455A (orignal valve body which is blind flanged).
87-0173	Reducing orifice Loop "C" RTD bypass missing
87-0231	PCV-456 (PORV) possible overstress of piping welds

STRENGTH AND WEAKNESS IDENTIFIED FOR THIS ELEMENT

Strength

No particular aspect of the licensee's program was considered a STRENGTH.

Weakness

The program did not provide a process and requirements for communicating important information to systems engineers regarding questionable conditions identified in the course of maintenance. This issue is discussed further in Section 6.3.

Conclusions

The team consensus was that the licensee has established and implemented a maintenance program which incorporates provisions for performance of all the important aspects of maintenance, and that the program provides for including changes as might stem from new or corrected vendor recommendations, etc. Both the licensee program and its implementation were judged to be GOOD.

3.5 Conduct Performance Measurement

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the methods by which the licensee assesses maintenance performance.

The NRC team inspection of this element examined and assessed the licensee's use of the following methods of performance measurement:

Plant walkdowns

Maintenance performance indicators

Root cause analyses

Quality assurance audits

Meetings

The inspection was conducted through interviews with licensee personnel, attendance of licensee meetings, and reviews of documentation.

Findings

Plant walkdowns:

Based on a review of licensee data, the inspectors found that the plant supervisory and systems engineering personnel have not frequently entered the RCA and/or containment areas that contain much of the plant's important safety-related equipment. A summary of the

data obtained is presented in Appendix 3. In a memorandum dated October 13, 1988, the Plant Manager specified that upper plant management personnel should spend at least two hours daily touring the plant. He did not specifically ask that any of the tour be spent in the RCA.

Maintenance performance indicators:

The team reviewed the following Turkey Point performance indicator documents:

Maintenance department indicators - for six month period ending November 7, 1988
Nuclear Energy Quality System Indicators - monthly for January through August 1988

1988 Short Term Plan for Nuclear Energy Department - trend of monthly data from January 1988 through September 1988

The above contain trend data such as equipment out of service, corrective maintenance backlog, control room deficiency tags, unplanned days off line, equipment availability, lost time accidents, man rem exposure, LERs, hours in LCO, etc.

Based on their review the team believes that the licensee's trending of performance data is adequate.

Root cause analysis:

The team reviewed licensee root cause analyses for the following:

Intake Screen Wash Instrumentation

ARMS Channel 19 Cable Failure

Boric Acid Blender Flow Converter

Safety Injection Accumulator Level Transmitters

Reactor Vessel Level Drain Down Indicators

Steam Generator Blowdown Flow Transmitter Drift

Feedwater Bypass Valve Leakage

R-15 Condenser Off Gas Moisture Intrusion

The team found that the analyses were thorough and satisfactory. They were performed by maintenance engineers.

Meetings:

The team members attended many of the licensee's Plan of the Day and other meetings. The inspectors felt that they were adequate, but that their appeared to be insufficient communication up to management from lower level personnel.

STRENGTH AND WEAKNESS

Strength

Current root cause analysis methods

Weakness

Apparently inadequate feedback to management through meetings and/or walkdowns

Conclusions

The team consensus based on evaluation of the above findings was that the licensee's program and implementation for this element are adequate, although better direct methods for feedback to management are needed.

3.6 Document Control System for Maintenance

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

The team consensus was that this element was adequately addressed and implemented. The overall rating of the area was satisfactory.

Scope

This element encompasses the document control system utilized for control of maintenance documents.

The element was inspected by sampling the flow of maintenance activities from initiation of work orders to the completion and close out of the work packages, to determine whether:

(a) A document control system was established for control of maintenance activities

(b) Proceduralized documents established the following:

- Responsibility for maintenance
- Accountability for work
- Authority
- Lines of communication
- Documentation requirements
- Required references
- Means of review

(c) The control of maintenance activities were documented and means for the following were established.

- Document modifications resulting from regulatory requirements, codes, standards, guidelines changes, and from plant and industry maintenance experience.
- Assuring responsibility for changes.
- Adequate levels of review for implemented changes
- Assuring proper changes to documentation

(d) The document control system establishes traceability.

(e) The document control system will periodically be reviewed and updated.

Findings

The licensee had established and implemented a satisfactory maintenance document system for plant work orders via procedures O-ADM-701 and AP 0190.86. Their means of review, approval and updating of the maintenance procedures as documented in O-ADM-100, O-ADM-710, AP-0109.1, AP-0109.3, AP-0109.6, AP-0109.7 and AP-0109.14 was satisfactorily documented and implemented.

The team found that errors did occur in recognizing that some records for maintenance support areas required collection and storage as QA records. Examples are noted in Sections 4.5 and 7.2. These examples are cited as Violation 250,251/88-32-04.

STRENGTH AND WEAKNESS IDENTIFIED FOR THIS ELEMENT

Strength

Though the document control system appeared to be generally satisfactorily documented and implemented, no features were noted which were sufficiently outstanding to be termed STRENGTHS.

Weakness

The failure to recognize and maintain certain records, as QA records (e.g. maintenance of HP certification records as discussed on Section 4.5; and maintenance of EQ warehouse storage records as discussed in Section 7.2).

Conclusions

It was the consensus of the NRC team that the document control system for maintenance should be rated SATISFACTORY both in program and implementation.

3.7 Maintenance Decision Process

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses Corporate and Plant management's awareness of and involvement in decisions regarding maintenance activities such as the need to simply maintain as opposed to upgrading or replacing; recognition of need for actions to address plant aging; and whether maintenance work should be deferred.

The element was inspected through interviews with licensee employee's and review of documentation. The personnel and documents are identified in Appendices 1 and 5, and/or in the text below.

Findings

It appeared that in the past, Corporate management preempted plant management decisions on maintenance, often placing excessive emphasis on short term availability rather than upgrading equipment to correct continuing hardware problems. The team believes that this has changed and that current site management is involved in the day-to-day decision making process related to maintenance, and that their degree of involvement is appropriate. The team also recognized

that not all decisions in the past reflected an emphasis on short-term availability. Cases in point are the installation of new batteries, new inverters, the turbine integrated rotor modification, the generator rotor rewind work, offsite power reliability improvements, as well as installation of new diesel generators. The team was told that additional batteries and chargers will be installed to provide increased flexibility of operation.

In reviewing this element the NRC team examined the FP&L/TPN Quality Improvement Program, which is a major vehicle through which problems are identified, analyzed, evaluated and solved. The QIP system is a collaborative decision making system in which decision making Quality Improvement (QI) teams are formed consisting of managerial, professional and craft personnel. These QI teams utilize a structured problem solving/decision making process which emphasizes problem identification, root cause analysis, counter measure/alternative approach analysis, efficiency and effectiveness, and consideration of future impact on TPN activities. Also, they utilize indicators of performance to measure progress. Management reviews QI team progress through a tracking system, and displays team performance indicators so that all employees may keep informed.

It is the team's understanding that the QIP problem solving and root cause analysis approach is utilized by top management in their deliberations related to maintenance plant problems with Corporate level management. This is an indication that management sets an example for other employees related to problem solving and root cause analysis and encourages such activities on all levels.

The NRC team was generally impressed with some of the results coming from the QIP, but also noted that without a strong driving force the resolution of important problems may be dropped or excessively delayed. For example, a QI team has been working on the licensee's spare parts availability problems for over six months, but as yet, no significant correction has resulted.

Corporate staff currently participates in TPN maintenance planning and activities in a supporting role. The Corporate staff acts in a support role to TPN reviewing work activities, programs, and needs. The Corporate staff has taken the lead on defining special maintenance needs stemming from environmental qualification requirements. The team, however, finds Corporate management should be more involved in documented plant walkdowns and should become more familiar with the various plant systems. The Corporate management should take the lead on longer term problems such as aging.

There may not be sufficient communication of important information to management because of apparent deficiencies in the technical support function and the failure to be more directly aware of and involved in the problems of maintenance as through walkdowns of important plant work areas.

STRENGTH AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strength

The QIP

Weaknesses

(1) Insufficient and/or inadequate technical information input to the decision process due to inadequate technical support.

(2) Insufficient Corporate management awareness of and active involvement in providing technical support needed for the decision process.

Conclusions

The team consensus was that the program for the decision process and its implementation are functioning SATISFACTORILY, but that they could be improved through additional corporate and plant technical support.

4.0 Technical Support

Rating:

Program: SATISFACTORY

Implementation: POOR

This area encompasses the elements of technical support that are needed for maintenance to function effectively. It is defined to include internal/Corporate communication channels, engineering support, probabalistic risk assessment (PRA), QC, radiological controls, safety review and the integration of regulatory requirements.

The team consensus was that the technical support for maintenance was programatically SATISFACTORY, but that its implementation was POOR. This conclusion was reached after consideration of the relative importance of the STRENGTHS AND WEAKNESSES identified for each element evaluated by the team in this area.

Important to the team's conclusions in this area were perceived deficiencies in engineering support; insufficient number of QC inspectors; the lack of a PRA; and inadequate communications with the corporate (off-site) engineering function.

4.1 Establishment of Internal/Corporate Communications Channels

Ratings:

Program: SATISFACTORY

Implementation: POOR

SCOPE

This element encompasses the extent to which each department or organization has established channels of communication between the Corporate organizations and the maintenance organizations. The inspection was focused on the following items: information transfer, problem resolution, willful support, and mutual organization respect.

During the course of the inspection, the inspectors conducted interviews with the licensee plant personnel, performed thorough plant walkdowns and made observations to determine the extent of internal and corporate communications.

Personnel contacted for this element of the inspection included: Systems Engineer for the Instrument Air System, Quality Assurance Superintendent, Quality Control Supervisor, and Assistant Mechanical Maintenance Manager.

Documents reviewed for this element included: Generic Letter 88-14; FP&L inspection report dated October 27, 1987, Rust and Debris Inspection; Memorandum dated October 5, 1988, Management Presence in the Plant and Attendence at Meetings; and the Monthly Overtime Status Report for the QC organization for the month of November 1988.

FINDINGS

(a) The administrative procedures that were in place called for well regimented lines of communications between the organizations.

(b) The plant and corporate management appeared to want to improve the communications between their organizations.

(c) There did not appear to be any real lack of respect between the various organizations.

(d) On-site management response to an an important initiative established to increase their awareness of plant conditions, work force morale, and oversight of critical jobs appeared inadequate. The plant manager issued a letter on October 13, 1988 requiring top management to spend two hours a day in the plant. As of the December 1988 NRC inspection those personnel listed on the letter did not appear to have adequately fulfill those requirements as indicated by the Radiation Controlled Area (RCA) entry records. If maintenance management personnel were

making daily tours, they appeared to be missing a good deal of the plant by not touring inside the RCA. The entry date on which this finding was based is shown in Appendix 3.

(e) There appeared to be a failure of communications between the system engineer for the Instrument Air System (IAS) and the Corporate engineering department (JPE) regarding the significance of the IAS. Even though the Generic Letter 88-14 had been issued by the Nuclear Regulatory Commission and required a response within 90 days, the system engineer had been unable to obtain a corporate engineering response to the Rust and Debris Inspection that was performed on the Instrument Air System in October of 1987. The report was sent to Corporate engineering for final evaluation and acceptance or recommendations for further inspections in 1987 and as of December 1988 there had been no response from the corporate engineer. The corporate response to that report is to be used as a significant basis for any further testing or inspection criteria utilized in response to the Generic Letter. It is the team's understanding that Corporate engineering had been similarly delinquent in providing requested thrust values for the plant's motor operated valves.

STRENGTHS AND WEAKNESSES FOR THIS ELEMENT

Strengths

No features were identified that were sufficiently outstanding as to be termed STRENGTHS.

Weaknesses

(1) Failure to adequately implement a requested management tours or walkdowns of the plant.

(2) Inadequate communication between the plant and Corporate engineering in addressing technical problems (e.g., regarding a rust and debris inspection related to NRC Generic Letter 88-14)

CONCLUSIONS

The team consensus was that the program for element was adequately addressed but that implementation was inadequate and requires a good deal more attention by corporate management. The poor implementation rating is based primarily upon the impressions the inspectors received during the many interviews with various plant personnel which indicated that the plant organizations and the Corporate engineering organization are not communicating well.

4.2 Inspect Engineering Support

Rating:

Program: SATISFACTORY

Implementation: POOR

Scope

This element represents the application of engineering principles and evaluations in support of the maintenance process. It was inspected by the NRC team through interviews of engineering and management personnel and review of documentation [modification packages, procedures, portions of Equipment Qualification (EQ), etc.]. Procedures reviewed and personnel interviewed specifically with regard to this element are noted in the Findings below.

Findings

The inspectors found that engineering support for maintenance was principally provided through Technical Department systems engineers, Maintenance Department maintenance engineers, and Project on-site (Site Project Engineering) and off-site [Juno Project Engineering (JPE)] engineers. The off-site engineers were primarily involved in major modifications. The on-site engineers (hereafter referred to as site engineers), systems engineers, and maintenance engineers were directly involved in supporting plant maintenance.

The site engineers were primarily involved in small modifications, material qualification upgrades, and safety evaluations. This work is administratively controlled by Requests for Engineering Assistance (REAs), Plant Change/Modifications (PCMs) and Design Equivalent Engineering Packages (DEEPS). The governing procedures are JPE-QI-3.7, Engineering Equivalent Changes, and AP 0190.84, Request for Engineering Assistance.

The team reviewed several of the PCM packages, involving both completed work and work in progress. No deficiencies were noted in the PCM's except with respect to post modification testing. In almost every case the post modification testing requirements were inadequately described. Typically, a standard paragraph was used which simply stated:

> "Testing shall be performed to ensure the correctness of the reworked condition. Applicable plant and startup procedures shall be used in accordance with Post Maintenance Testing Administrative Procedure AP.0190.28."

AP 0190.28 provides only vague guidelines regarding testing, such as "check for leakage", "operationally check the pump", or "stroke the valve". No vendor requirements, design specification requirements or inservice testing reference values are specified to be checked. None of the PCM packages reviewed stated acceptance criteria or operating characteristics to be verified to assure satisfactory correction of the unsatisfactory conditions addressed by the modification work.

The systems engineers were found to be organized into three groups, Electrical/I&C, Balance-of-Plant and NSSS, each having a lead engineer who reported to the Operations Support Supervisor. He reported to the Technical Department Supervisor who in turn reported to the Plant Manager. The concept of having engineers dedicated to maintaining the integrity of particular systems assigned to them had been in operation at TPN for about two years. The NRC heartily endorses the system engineering concept, however, it has not been implemented adequately at TPN for the following reasons:

(a) Due to personnel turnover and re-assignment, engineers had limited time to become familiar with their assigned systems (average tenure with a system being about six months).

(b) Responsibilities of the system engineers were not well-defined as evidenced by the fact that responsibilites had not been documented and formally issued (only handwritten drafts existed).

(c) The system engineers had not been walking down their assigned systems. Six of seven engineers interviewed by one NRC inspector had not performed any walkdowns in 1988.

(d) The team had the impression that the efficiency of the systems engineers was reduced because information such as PWO's and NCR's were not made readily available to them.

(e) The system engineers were not really tracking all component failures on their systems. This was partially due to the fact that the work tracking system (computerized) did not have the software to automatically track component failures.

(f) Approximately 50% of the 18 systems engineers were contract rather than FP&L employees.

(g) The great majority of the system engineers had not received adequate training in the design and operation of their assigned systems.

(h) The number of systems engineers appeared insufficient. Engineers interviewed stated their time was spent on specific component problems rather than system problems.

There were found to be a total of five electrical/I&C systems engineers. The average professional experience of these engineers was 13 years. Their company affiliation and discipline are tabulated below.

Position	Employer	Discipline
Lead Person	FP&L	Electrical
Engineer	CE	Electrical
Engineer	CE	I&C
Engineer	CE	Elec/I&C
Technician	FP&L	I&C

In recent months, these engineers had spent nearly all of their time on the following tasks:

(a) Acting in liaison role between the plant and Corporate engineering in the processing of requests for engineering assistance

(b) Responding to formal and informal requests for engineering assistance

(c) Reviewing new or revised technical procedures

(d) Reviewing modification packages for completeness

(e) Being actively involved in special tests such as the integrated safeguards test

(f) Reviewing work orders and trending variables on their assigned systems

The maintenance engineers in the mechanical discipline were evaluated, and they were determined to have been effective in fulfilling their role. Duties of the mechanical maintenance engineers were:

(a) Root cause failure analysis when requested

(b) Advise the maintenance crews in the performance of their work

(c) Interface with the systems engineers and project engineers

The Maintenance Department must depend on the Engineering Department to define the special maintenance requirements associated with maintaining compliance with 10CFR50.49 (Environmental Qualification) requirements. One team member held discussions with cognizant plant and corporate personnel to obtain an overview of how this support function was accomplished. The EQ Master List indicates any special maintenance requirements for each component on the list. Administrative Procedure ADM 704 "EQ Maintenance Index" incorporates these special maintenance requirements into a procedure. Then the "Maintenance Tracking System" contains the actual work schedule. A consultant company, Engineering, Planning and Management Co. (Boston) independently reviewed ADM 704 and the preventive maintenance procedures to assure their adequacy. The Quality Assurance Department periodically selects components for program validation. Necessary changes to the program are handled by the PCM method. Special NRC inspections of the licensee's EQ program did not identify any problems in the area of EQ maintenance.

The NRC team felt that some useful root cause analysis work was being accomplished by the maintenance engineers, however, this effort has previously failed to correct several recurring problems in the instrumentation and control area. Examples of these hardware problems are:

(a) The condenser air ejector radiation monitor (R-3-15) does not work properly. This instrument is primarily used as first detection of a steam generator tube rupture accident. While operators may compensate by taking samples, some potentially valuable information is lost.

(b) Several area radiation monitors, that give indication at the area radiation monitoring panel in the control room, are out of service.

(c) The control room air intake radiation monitor spikes high during functional testing causing an isolation of the control room ventilation.

The Operations personnel interviewed indicated that these, and similar, problems had been ongoing for many years. Management stated that recently several I&C engineers had been added to the staff specifically to address these problems. Based on past performance, Operations personnel were skeptical regarding correction of these problems.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The team did not identify any aspects of the engineering support function that were clearly superior to average industry-wide performance.

Weaknesses

(1) Plant Change/Modification packages did not adequately address post modification testing.

(2) The system engineering concept, while part of plant policy intended to address recognized engineering support deficiencies, was not being implemented adequately.

(3) The examples of repetitive failures or perpetually malfunctioning equipment described in this section indicate that the technical support function should be strengthened.

Conclusion

Plant management indicated that they were aware of deficiencies in the area of technical support and, specifically, they were already aware of the weaknesses noted above. Actions to more vigorously implement the system engineering concept and to increase engineering staff had been initiated even before the maintenance inspection. Nevertheless, a rating of POOR implementation was considered warranted. The team gave credit to the licensee for programmatic corrections in progress and thus, rated the program for this element SATISFACTORY.

4.3 Inspect the Role of PRA in the Maintenance Process

Rating: MISSING

Scope

This element encompasses the use of Probabilistic Risk Assessment (PRA) concepts in planning, scheduling, prioritizing, and performing maintenance work.

Findings and Conclusion

From interviews with licensee personnel the team learned that the licensee has not performed a PRA for their plant. This element is missing.

4.4 Inspect the Role of Quality Control

Rating:

Program: SATISFACTORY

Implementation: POOR

Scope

This element represents the extent to which quality control is implemented into the maintenance process. The inspection focused on the following areas: criteria for audit and inspection have been established, documented and used consistently; criteria for reporting of deficiencies has been established and is used effectively; implementation of quality control in the preparation and issuance of process work orders; and how well the quality related work is being monitored to ensure that it is being performed in an acceptable manner.

The documentation reviewed for this area included: Turkey Point Self Assessment; O-ADM-701, Preparation of Process Work Orders; O-ADM-500, Control And Use of Vendor Manuals; AP-0190.19, Control of Maintenance on Safety Related and Quality Related Systems; AP-0190.72, Receipt Inspection, Identification & Control of Safety Related and Quality Related Parts, Materials & Components; and AP-0190.12, Nonconforming Materials, Parts And Components.

Findings

(a) The QC program was well documented by the licensee and was a very thorough and ambitious quality control program.

(b) There was not enough manpower available to perform the program as documented, as there were only six inspector positions allotted and only five of them were filled. As a consequence the QC inspectors were working excessive overtime (estimated 50%).

(c) There was a good deal of emphasis placed on the foreman and supervisors to do peer inspections of the work being performed by their journeyman. The NRC team inspectors questioned whether this was being accomplished. They observed less than satisfactory cleanliness controls being implemented by the workers when they opened the systems upstream of the Reactor Coolant System for maintenance. It was noted during this inspection that the initial opening of a system and/or component was almost never witnessed by a QC inspector. This was the prime time for the foremen to be doing their monitoring responsibilities, and the NRC inspectors noted on at least two separate occasions that a system was opened without a foreman or QC inspector in attendance. It was also noted that the workers

did not adequately clean the equipment prior to actually opening the system, and therefore, there were items introduced into the system which will eventually find their way to the reactor vessel and may end up as new hot particles. The two occasions were the installation of the Residual Heat Removal System pump casing and the disassembly of one of the Safety Injection Accumulator isolation valves.

(d) In addition to all of their normal inspection responsibilities, QC inspectors were found to be required to perform reviews of all PWOs being processed to determine what involvement QC needed to have in the work process. They were also required to do post work reviews of selected PWOs to ensure that all the work and inspections were in fact conducted in accordance with all applicable practices and documentation. Additionally, they were found to be responsible for the investigation and closeout of any and all Nonconformance Reports. All new or revised maintenance procedures were required to be reviewed by these same inspectors to ensure inclusion of proper quality control requirements.

(e) Several team members noted that craft personnel lose substantial work time waiting for QC inspectors to arrive and perform the required inspections. Follow-on discussions were held with plant management regarding this loss of valuable work time, work scheduling problems, and on the apparent QC manpower shortage. Indications were that plant management were unaware of the problems.

CONCLUSIONS

The team consensus for this element was that the program provides for the proper control of quality related activities but that implementation of the program required additional management support to ensure that it could funtion adequately. The POOR implementation rating is a result of the significant weight the team placed on the understaffing condition that exists within the QC inspectors area.

4.5 Integrating Radiological Controls Into the Maintenance Process

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element represents the coordination and integration of radiological controls into the planning and performance of maintenance work. It includes the ALARA steps that are incorporated

into the work planning as well as ALARA practiced during the performance of work.

Inspection related to this element was conducted principally by the team member who is a health physics specialist. Related observations from other team members were utilized in its assessment.

The inspection was performed thorough observation of the licensee's radiological control practices during plant tours, while observing maintenance, through reviews of related records and procedures and through interviews with licensee health physics and maintenance personnel. Personnel interviewed included the ALARA Supervisor, HP Supervisor, HP Operations Supervisor, Assistant HP Supervisor, Dosimetry Supervisor, I&C and Planning Supervisor, Maintenance Training Coordinator, and Corporate Health Physicist. Procedures reviewed are listed in Appendix 5.

Findings

The findings are divided into the categories - (1) Health Physics Organization Qualifications Training and Support of Maintenance Activities, (2) ALARA Program, (3) Internal Exposure Control, and (4) External Exposure Control.

(1) Health Physics Organization Qualifications Training and Support of Maintenance Activities

The inspector reviewed the licensee's radiological protection organization, staffing levels, qualifications, and its methods and degree of interaction with the maintenance programs.

From his review he determined that the licensee's radiation protection organization was adequately structured to support maintenance, in that, the licensee had a sufficient number of ANSI 18.1 - 1971 qualified technicians onsite to support the large work effort needed to accomodate two units in an outage. However, the number of FP&L (i.e., non-contract) ANSI qualified health physics technicians was low in comparison with plants of similar size. The licensee has historically relied on contract HP support to supplement the plant's staffing levels during routine operations. The licensee reported that they had authorization for 50 ANSI HP technician positions, 23 of which were not filled. They reported that the health physics staff had a total of 39 vacancies in all.

With both units in an outage during the inspection, the inspector determined that the licensee had approximately 70 ANSI qualified contract HP technicians and approximately 50 junior contract HP technicians on site to support the maintenance activities. The staffing levels appeared to be adequate, and

there was no apparent shortage of health physics personnel to cover the work load.

The licensee had established a health physics staffing goal for 1989, which should preclude any requirement for contract health physics support during non-outage periods. According to licensee representatives, the licensee's HP staffing goal is self sufficiency during non-outage operation periods with supplemental use of contract health physics support only in outages.

Technical Specification 6.3.1 requires that each member of the facility staff meet or exceed the minimum qualifications of ANSI N18.1 - 1971. Paragraph 4.5.2 of ANSI N18.1 - 1971 states that technicians in responsible positions shall have a minimum of two years of working experience in their speciality. Licensee Administrative Procedure 11550.80 (Health Physics Procedure HP-30, Qualification of Personnel) dated April 29, 1986 provides the guidelines for the qualifications program for Health Physics Department personnel and Health Physics contract personnel. Section 7.0, in part, states that contractor qualification guides constitute Quality Assurance Records, and therefore, shall be transmitted to Document Control and be retained for the lifetime of the plant in accordance with quality assurance record requirements. Licensee procedure, 0-HPA-003, Control of Health Physics Records revision dated July 5, 1988, Section 5.1.5 requires completed quality assurance records be turned over to the health physics records custodian to file quality assurance records in an approved Quality Assurance cabinet for storage until the records are stored in the plant quality assurance record storage area.

The inspector randomly selected ten contract HP technicians from a duty roster to evaluate the technicians' qualifications during the first week of the maintenance inspection. The licensee could only provide the inspector qualification and training files for six of the ten requested. Of the six records reviewed two did not have the completed qualification records required by the licensee's procedure. During the second week of the inspection, the inspector reviewed all of the on site contract health physics technicians' qualifications and training records and determined that the records were adequately documented. However, the licensee had not stored the records in accordance with quality assurance requirements, in that the records were not indexed or stored in an approved storage method. Prior to the initial request to review the training and qualification records the inspector determined that the records were stored by several individuals at various locations.

The inspector informed cognizant licensee personnel that this failure to maintain qualification and training records for contract health physics in accordance with quality assurance procedures was a violation of 10 CFR 50, Appendix B, Criterion XVII. It is identified as Violation 250,251/88-32-04, QA Records Not Properly Stored. Another example of this violation is described in Section 7.2.

Technical Specification 6.4.1 states that a retraining and replacement training program for the facility staff shall be in accordance with ANSI N18.1-1971. Paragraph 5.5 of ANSI N18.1 states that a training program shall be established which maintains the proficiency of the operating organization through periodic training exercises, instruction periods and reviews. While reviewing the contract health physics technicians qualifications, resumes, qualification check off guides and written examinations, the inspector determined that several contract personnel had qualification guides and examinations that were several years old. The inspector determined that the licensee did not have any requirements to conduct periodic evaluations of contract health physics technicians knowledge of plant specific procedures. Licensee representatives agreed that periodic reassessment of contractor health physics technicians was important and proposed a procedure revision to address specific training and Health Physics Department responsibilities including retraining requirements for contract health physics technicians. The licensee stated they planned to implement the new procedure by June, 1989. The licensee's failure to have and implement procedural requirements for periodic retraining of contract HP technicians is a violation of TS 6.4.1 and 10 CFR 50, Appendix B, Criterion V. This was identified as an example of procedural violations included in Violation 250,251/88-32-02, Procedural Related Deficiencies. Additional examples are described later in this report in Sections 5.2, 5.8, and 6.3.

Through interviews with maintenance personnel at work locations thoughout the plant, the inspector determined that the plant maintenance staff in general believed that the health physics staff was providing adequate support.

In a presentation to the inspection team on November 28, 1988, a licensee representative reported that the planning and scheduling coordination had been poor in the past. The licensee had just recently assigned an individual with a health physics background to the planning and scheduling group. This organizational change was made to improve the planning process by having health physics matters considered in the early planning stages of maintenance activities. The planning representative was able to cue the plant's radiation protection staff to prepare for upcoming work in areas where health physics

support would be required. This allowed the health physics group time to make appropriate surveys, set up necessary equipment, and set radiation protection requirements prior to the start of the maintenance activity. According to licensee representatives, the addition of a health physics planner had improved maintenance efficiency since the plants radiation protection staff could be prepared to support maintenance activities when maintenance task were assigned.

(2) ALARA Program:

The licensee's ALARA Policy is described in D-ADN-60, Health Physics manual, June 28, 1985. The policy statement commits Florida Power and Light Company to ensure that radiation exposures to personnel are kept as low as is reasonability achievable (ALARA). The policy describes responsibilities for the Group Vice President of Nuclear Energy, the Vice President of Nuclear Operations, the Plant Manager, the Corporate Health Physicist, the Plant Health Department Supervisor, the Health Physics ALARA Coordinator and the Health Physics Training Department Supervisor. The policy document also provides the guidelines for preplanning job/task activities and establishes a requirement for the plant to have an ALARA Review Board to periodically evaluate the effectiveness of the plants ALARA program. The document requires that the ALARA Review Board meet at least on a quarterly basis and/or after each refueling outage. The licensee implements the company policy through O-HPA-006, ALARA Program, revision dated August 30, 1985, which further describes the responsibilities for the plant staff.

The licensee determines an annual exposure for the staff based on historical information and work planned for the up-coming year.

In existing procedures the Health Physics ALARA Coordinator has the responsibility to determine station annual radiation exposure estimates. The coordinator receives information from the various plant work groups on planned work and calculates a person-rem exposure rate for an outage day and a non-outage day based upon historical exposure information. The licensee also added 20 non-scheduled outage days per unit in its 1988 person-rem exposure estimate. The licensee's exposure estimates are tracked on a daily basis with direct reading dosimeters (DRD's) and the licensee's person-rem goals are made for DRD's. According to licensee documentation the exposures measured from their thermoluninescent dosimeters (TLD's) are approximately 80% of the DRD exposure. That is, DRD's tend to over-estimate exposure by 20 percent. The 1988 person-rem estimate based on DRD's was projected to be 900 person-rem. In October the licensee revised the projected 1988 person-rem exposure to 1470 person-rem (DRD). The majority of the exposure increase was due

to expanded work scope for the planned Unit Four outage. As of November 30, 1988, the licensee person-rem exposure was only 733 person-rem.

The primary reason that the estimated person-rem exposure was below earlier projection was due to an unexpected Unit 3 outage. The unplanned outage on Unit Three was moving planned work and exposure for Unit 4's scheduled outage into 1989. As a result, it appeared that the licensee's 1988 person-rem would be approximately 400 person-rem per unit (TLD). This exposure would be close to national averages for Pressurized Water Reactors.

ALARA Review Board

The inspector attended an ALARA Review Board Meeting held December 15, 1988. The agenda included setting person-rem exposure goals for 1989. The ALARA coordinator proposed an estimate of 1200 person-rem (TLD) for 1989. The increase person-rem exposure in 1989 of approximately 400 person-rem was attributed to extending the number of forced outage days, expanded Unit 4 refuel outage work, and a planned refueling outage for Unit 3.

The plant manager reviewed the proposed person-rem estimate for 1989 and found it unacceptable in that the annual person-rem exposure was too high and not in line with national person-rem exposure's per unit for similar pressurized water reactors. The plant manager also found the forced outage contribution of 80 days per unit at 2 person-rem per day excessive. The plant manager requested the ALARA coordinator to reevaluate the method used to derive the annual goal and to target a goal of 375 person rem per unit. The ALARA coordinator agreed to re-evaluate the 1989 person-rem estimates and discuss the results in a future meeting. The plant manager stated that he expected the forced outage days to decrease in 1989, and that he wanted to make contractors accountable for their exposure contribution, which was about 70% of the 1988 person-rem total in December of 1988.

Health physicists from the utilities corporate staff presented an Exposure Reduction Plan, which identified numerous exposure reduction activities/methods to reduce the licensee's radiation exposures. Implementation of the proposed Exposure Reduction Plan would require significant plant management support and resources. The inspector noted that the list included numerous short and long term exposure reduction activities that have been proven to be effective in reducing plant radiation sources and exposure levels at other similar facilities. The ALARA board agreed to consider the proposed exposure reduction activities and make assignments for consideration and implementation.

Representatives from the plant health physics staff reported on the use of "zone coordinators" in the licensee's Unit 4 containment. Licensee representatives reported that having specific health physics personnel assigned responsibilities for certain areas within containment was under review and appeared to be successful in controlling and assisting maintenance activities and providing continuity for work in the assigned areas. The majority of zone coordinators were plant personnel, however, the licensee did have two contractor personnel coordinating work. The success of the zone coordinators has not been fully evaluated, but appeared to be an appropriate management approach to provide adequate radiological protection measures and surveillance for maintenance activities.

ALARA Planning and Exposure Tracking

The inspector reviewed selected ALARA Preplanning packages and determined that the licensee was utilizing various ALARA techniques on numerous maintenance activities. During the inspection the inspector observed pre-job briefings, discussed with maintenance personnel the ALARA methods that would be applied to minimize radiation exposure for planned work, and observed the use of a shield mockup. The inspector reviewed a video made by the ALARA staff which showed maintenance workers practicing the construction of a temporary shield wall that would later be erected in a high dose rate area to reduce radiation exposure.

The inspector reviewed selected computer printouts that are used to track exposure for various radiation work permits (RWPs) or tasks. The printouts can provide supervisor information on occupational radiation exposures their staff may have received.

(3) Internal Exposure Control:

Technical Specification 6.8.1 requires written procedures to be established, implemented, and maintained to meet or exceed the requirements and recommendations of Appendix A of USNRC Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A recommends that the licensee have procedures addressing respiratory protection. Licensee Administrative Procedure 0109.6, Temporary Procedures, dated August 4, 1987 states, in part, that temporary procedures shall be approved for duration time period of no more that one year from the date of Plant Manager - Nuclear approval and that the Operators Department is responsible for transmitting the obsolete temporary procedure for record retention.

During plant tours, the inspector observed the use of temporary ventilation systems, containment enclosures, and respirators to limit or prevent exposures to airborne radioactive material.

The inspector reviewed records for several workers who were issued respirators to determine the workers qualifications for use of the respirators and determined that the workers were properly qualified.

The inspector reviewed the licensee's procedures for sampling airborne radioactive material, reviewed selected air sample surveys, and verified that air samplers utilized to survey airborne radioactive material were properly calibrated.

The inspector observed the use of supplied air respirators in the Unit 4 containment for various maintenance tasks in highly contaimnated areas. The inspector observed the use of supplied air respirators receiving air supplied from the plant's breathing air system and portable breathing air systems. The inspector reviewed the breathing air quality evaluation records for the systems and verified that the air quality met the requirements for Grade D Air as specified in Compressed Gas Association Commodity Specification G - 7.1, 1966.

The inspector determined through interviews with licensee representatives that the breathing air quality was evaluated with air testing equipment operated by the licensee's safety staff. However, the inspector determined that the breathing air quality testing was not procedurally addressed, and the inspector stated that failure to operate the testing equipment without approved procedures was a violation of Technical Specification 6.8.1. This is another example of procedural deficiencies noted earlier in this section and identified as Violation 250,251/88-32-02.

The inspector verified that the supplied air respirators were operated and used in accordance with their certification requirements extended by the National Institute for Occupational Safety and Health Administration/Mine Safety and Health Administration/(NIOSH/NSHA). By reviewing records, the inspector verified that the pressure gauges on the portable and plant breathing air systems were calibrated as required by 10CFR20, Appendix A, Footnote h. The inspector also observed that the pressure supplied to respirators in use met the appropriate NIOSH/NSHA certification requirements for the respirators.

During a tour of the refueling floor in the Unit 4 containment, the inspector noted that a portable breathing air system not in use, had two operating procedures physically attached to the control panel. The procedures were TP-392, Operation of the Nomonox Portable Breathing System dated October 15, 1987 and O-HPT-064.1, Operation of the Nomonox Portable Breathing System dated October 4, 1988. Procedure TP-392 was a temporary procedure, which had expired on October 15, 1988, and differed

from O-HPT-064f.1 (the procedure in effect), in that it did not contain the same detail and did not specify the operating pressures necessary per length of supplied air hose per respirator necessary to ensure that the respirators were receiving air at pressures required in their NIOSH/NSHA certification. The temporary procedure had not been removed as required by licensee procedure 019.6, Temporary Procedure, dated August 4, 1987. The inspector noted that failure to remove the temporary procedure TP-392 could be considered a violation of licensee procedure 019.6 and failure to follow procedures as required by Technical Specification 6.8.1.

As only one instance of failure to return an expired procedure to Document Control was observed and as the current procedure was found with the expired procedure, this matter appears to have limited safety significance and will not be cited as an NRC Violation.

External Exposure Control

The inspector reviewed the licensee's procedures for monitoring external radiation exposure and control into the licensee's radiological control areas. The procedures reviewed were O-HPA-001, Radiation Work Permit Initiation and Termination, dated July 9, 1987 and OHPA-030, Personnel Monitoring of External Dose, dated April 30, 1987.

The inspector made tours of the licensee's laundry, personnel decontamination area, hot machine shop, health physics instrument calibration facility and of the auxiliary and Unit 4 containment buildings within the radiological control area (RCA). The inspector made independent radiological surveys and observed radiological postings in the RCA and found the areas properly posted and high radiation areas properly controlled.

The inspector observed work in progress in the licensee's auxiliary and Unit 4 containment buildings. He evaluated the radiological controls for workers performing maintenance on a safety injection system accumulator check valve, the Unit 3 B RHR pump motor, and the Unit 3A charging pump. The inspector reviewed the radiation work permits for each task and determined that the activities were properly controlled.

On December 15, 1988, the licensee's maintenance manager, the NRC team leader, and the team leader's supervisor (NRC Section Chief) attempted to enter the radiation controlled area to tour a RHR pump room and the Unit 3 containment. However, the group was delayed when a check of the licensee's computer records for control of such entries were found to indicate that the team leader had not logged out of the radiation controlled area during his previous entry early in November. During that entry, the team leader had been accompanied by the maintenance manager and believed that he had logged out properly. Licensee personnel stated that sometimes errors were made in the computer data entries and that this might account for the apparent error. In completing approval forms to allow the team leader to re-enter the radiation controlled area, the leader was informed that he had received an approximately 30 mr dose in his previous entries. The team leader questioned this as he did not believe he had been in any radiation area where the time and exposure levels would have been sufficient to have resulted in such a dose. In response to his questioning on this licensee personnel obtained records that showed the inspector to have made two other entries following his early November entry and in both instances exposures of about 15 mr were indicated. The inspector noted that he had made no entries subsequent to the early November entry and that he had not been on an inspection or at Turkey Point either of the days.

Later in this tour another error was observed in the licensee's entry controls for radiation areas. The maintenance manager, NRC team leader, and NRC section chief had completed their tour of the RHR pump room and were required to have a different Radiation Work Permit (RWP) logged in for their entries to the Unit 3 containment. The NRC section chief noted that log in personnel made an apparent error in the RWP number logged for the maintenance manager. This error was verified and then corrected by licensee personnel. The licensee was unable to explain the apparent error of the two entries documented in the licensee's personnel exposure tracking system and was continuing an investigation of the possible cause when the inspection ended. The inspector stated that investigation results would be reviewed in a future inspection as an Inspector Followup Item (IFI) 250,251/88-32-05, Controls/Accountability for Entry into Radiologically Controlled Areas.

The inspector reviewed selected personnel contamination reports completed in November, 1988. The reports were written for personnel in contact with hot particles. Hot particles were picked up in the Unit 4 containment, Unit 3 containment, laundry facility, personnel decon room, and the hot tool room. The licensee requires a dose assessment if the hot particle exceeds 25,000 dpm - hour. Six of the ten records selected showed a skin dose assignment. The dose assignments ranged from 18 to 157 millirem. The particles included fission and activation radio nuclides. The probable cause for nine of the 10 events was categorized as accidental, and one was identified as failed protective clothing. The radiological investigation report involving failed protective clothing did not state how the protective clothing (full protective clothing with a respirator) had failed. Corrective action included surveys in the areas where personnel had been working, counselling the employees on

work practices, and changing protective clothing requirements. In many cases, however, it appeared that the corrective action was weak and a more thorough investigation was appropriate. For example, in one case a worker exited Unit 4 containment, surveyed himself in a whole body frisker, went to the dressout area and dressed, and from there the employee proceeded to the radiological control area (RCA) exit point. At the RCA exit point the health physics personnel detected a hot particle on the outside of the employee's pants when he set off the whole body frisker. For counter measures the Radiological Incident Report (RIR) Root Cause And Corrective Action Evaluation documented "area surveyed for contamination and none found". The RIR did not indicate what areas were surveyed. For specific instructions/actions to prevent recurrence, the licensee documented "no corrective action required". The particle was sent to the counting room and found to contain 9.8 E-3 microcuries of cobalt 60 and 2.8 E-4 of cesiun 137 for a total 1.01 E - 2. The inspector stated that the root cause evaluation was inadequate in that no explanation was given for how a particle could have been on the outside of the individuals personal clothing. The time the individual may have been exposed to the particle was not discussed. A stay time of 0.5 hours was given for exposure time, but it is not clear from the documentation how 0.5 hours was obtained. If the particle had been on the employee for a longer period, a dose assessment may have been necessary. The inspector informed cognizant licensee personnel that a review of the licensee's root cause evaluations would be conducted in future inspections as IFI 250,251/88-32-06, Root Cause Evaluations in Radiological Incident Reports.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) The licensee has established a multi-disciplined planning section which includes a health physics specialist to interface with plant maintenanace and other planners in facilitating maintenance tasks

(2) The licensee has had a low turnover rate for health physics technicians

(3) The licensee has increased staffing level authorization

(4) The licensee has been able to obtain necessary numbers of contract HP techs to cover work load

(5) Strong policy statements have been issued from plant ALARA board

Weaknesses

(1) The health physics staff needs better input from the plant planners. The outage scope and work activities have been expanded in recent outages and that has caused unplanned support needs and attendant increased exposure.

(2) The training program and testing of contract technicians has not been clearly defined. As a result the licensee did not have a retraining program for those technicians that were qualified four to six years ago.

(3) The training and qualification documentation records have not been treated as QA records resulting in violation of 10 CFR 50, Appendix B, Criteria XVII.

(4) The licensee has a small HP staff when compared to other facilities of similar size and as a result has had to depend heavily on contract support.

(5) There is a lack of participation through the ranks in the exposure goal formulation and awareness and a lack of exposure accountablity by contractors and staff section heads.

(6) Licensee person-rem totals have consistantly been above the national average from 1984 through 1987. The licensee exceeded the national average for PWR's from 12% to 75% per unit.

(7) The licensee is behind other utilities in implementing many of exposure reduction techniques utilized in the industry today.

(8) An NRC maintenance inspection team member detected problems with the licensees dose tracking system (IFI 88-32-05).

(9) Documentation on radiological investigation reports is poor and improvement in root cause determination is needed.

(10) Failure to have a procedure for monitoring breathing air sampling to meet grade D air or better resulted in a violation.

(11) Control of procedures was identified as a possible problem. But as only one example was identified, it will be treated as an isolated incident and not cited as an NRC violation.

Conclusions

The inspector observed various jobs in progress and found that the radiation protection was adequate in each case. In general the radiation work permits described adequate protection requirements for

the work to take place. The licensee appeared to be monitoring maintenance activities closely. The assignment of a health physics person into the planning and the scheduling process should help improve worker efficiency and in turn help reduce radiation exposures. The trial use of zone coordinators in the Unit 4 containment could improve job coverage, communication, and efficiency.

The licensee has committed resources to the ALARA program to reduce personnel exposures to radiation. The existing ALARA program is defined in utility and site policy and administrative documents. The licensee has an ALARA staff including an ALARA coordinator, and technicians to support the on-going ALARA program. The licensee is conducting prejob planning and utilizing ALARA concepts on numerous maintenance activities. The licensee is tracking and reporting personnel radiation exposures per task. Department heads are attending ALARA Board Meetings and the site is receiving technical support and resources from the Corporate staff for exposure reduction activities.

The ALARA policy states that it is everyone's responsibility to minimize occupational radiation exposures. However, the inspector determined that accountability for keeping exposures low was poor, since the ALARA coordinator reported that section supervisors were not actively involved in planning methods for reducing personnel exposures. Through interviews with various maintenance foremen, the inspector determined that they were not aware of any section ALARA goals. Through reviews of exposure records reporting person-rem per section records, the inspector found that approximately 70% of the licensee's exposure was received by contractors.

The inspector also determined through interviews with health physics and ALARA personnel that outage planning had been weak, in that , it was common for the work scope to change significantly after the outage began. In general, the licensee has implemented some ALARA exposure reduction activities, however, the licensee's staff has depended mostly on health physics and ALARA initiatives to keep exposures ALARA when the licensee's staff needs to be more responsbile for keeping exposures ALARA.

Specifically, section supervisors (both plant and contractors) need to be more involved in the ALARA goal setting process by becoming more knowledgeable of planned maintenance, the exposure required for the task and techniques to reduce the exposure. The supervisors should be working closely with the ALARA staff, attempt to limit unplanned work, and be accountable for meeting the established goals and objectives to minimize personnel exposures to radiation.

During the ALARA Board Meeting the inspector attended December 19,1988, the plant manager made it clear that he wanted ALARA exposure reduction incentives in all contractor agreements. The lack

of accountability by contractors and the staff section heads for the ALARA program is identified as a program weakness.

The health physics supervisor and foreman level personnel need to spend more time observing work conditions. The root cause for personnel contaminations needs additional management attention. The licensee needs to review its techniques for monitoring hot particles and determining their source as well as taking steps to prevent the creation of additional hot particles thorough improved cleanliness control procedures. The licensee needs to pay attention to documentation detail in log books and radiological investigation reports. Filling the Health Physics staff vacancies needs continual attention. Additionally, the training and evaluation of contract health physics technicians needs improvement in testing and retraining.

The licensee's exposures for the year are near the industry average, primarily based on improvements reported by the licensee for the second half of 1988. Taking all of the above into consideration, the licensee's program and implementation for this element are rated SATISFACTORY.

4.6 Safety Review of Maintenance Activities

Rating:

Program: SATISFACTORY

Implementation: POOR

SCOPE

This element encompasses the integration of industrial safety into the planning and performance of maintenance work.

NRC inspection of this element was conducted through reviews of documentation, interviews with personnel, and observations of individuals conducting maintenance work.

FINDINGS

Through discussions with the licensee's Safety Supervisor the inspector determined that the licensee's safety program is administered through a joint safety program agreement between the licensee and the unions.

A Safety Committee exists which consists of the maintenance manager and two Union representatives from the mechanical discipline. The main purpose of the committee is to investigate accidents. Accident reports are submitted to the Corporate joint Safety Committee.

According to the Safety Supervisor, FP&L employees hold safety meetings on a monthly basis to discuss various safety topics. The Safety Supervisor trends accidents and provides reports to plant staff on accidents requiring medical attention and lost time accidents. The Safety Committee reports injury trends by the various crafts and also reports the type of injuries that are recurring. The Safety Supervisor utilizes a flow chart to identify root causes for various type injuries.

The inspector learned through the Safety Supervisor that the site's largest contractor, Bechtel, holds safety meetings once a week. Bechtel, also mans a first aid station on site and reportedly has persons trained in first aid on duty twenty-four hours a day, seven days a week. The licensee has an ambulance on site and is capable of transferring potentially contaminated personnel to a local hospital approximately twenty miles away.

In order to determine the extent to which electrical safety was integrated into the maintenance process, an NRC inspection team member completed the following:

(a) Discussed the records of accidents involving electrical equipment with the Site Safety Supervisor.

(b) Reviewed the extent to which electrical preventive maintenance procedures contained safety precautions.

(c) Observed ongoing maintenance activities including the grounding of 4.16 KV cables and buses.

(d) Discussed topics in the area of industrial safety with the Assistant Superintendent for Electrical Maintenance and electrical foremen.

The record showed that five accidents involving electrical equipment were reported in 1988. Each accident resulted in minor or no injury, and none were lost time accidents. Three of the accidents were caused by workmen while performing repair work or trouble shooting on 120 Volt circuits. Two of the accidents were partially attributable to poor maintenance. On August 30, 1988, at the intake structure, a man received an electrical shock while standing on the ground and touching the traveling crane. Investigation showed that the equipment ground path was lost due to the crane rail being painted for part of its length where the crane was stopped. During September, 1988, an electrician brushed against a 480 Volt molded-case circuit breaker, and received a shock while doing so. The circuit breaker switch (ON-TRIPPED-OFF) was broken which had exposed live parts in this older type circuit breaker.

Newly issued (upgraded) electrical preventive maintenance procedures instruct the user, in the Precautions/Limitations Section, to observe safety rules outlined in the FP&L Safety Rule Book. The rule book discusses many topics related to safety and includes a chapter entitled Power Resources/Nuclear Energy.

Besides reference to the Safety Rule Book, upgraded electrical procedures contain safety precautions at appropriate places throughout the procedure. Older procedures, still in use, do not contain nearly as many safety precaution. For example, Maintenance Procedure 9407.3, 4160 Volt A and B Bus Switchgear Cubicle Component Inspection, merely states, "This procedure is intended for use <u>only after a full bus clearance has been issued, and safety grounds have been installed.</u>"

Observation of ongoing electrical maintenance activities including 4160 Volt and 480 Volt work led the inspector to conclude that safety is taken seriously by the electrical maintenance crews. Foremen were observed to fulfill their responsibilities in the area of safety by conducting pre-work briefings and walkthroughs for any work involving the possibilty of contact with 4160 Volt (or above) live parts.

Through interviews with licensee representatives the inspector determined that reporting safety concerns or problems was easily accomplished by phone. The number to report safety problems was on most of the phones at the site. The person reporting the concern did not have to get involved in filling out paperwork. Employees were taught in General Employee Training (GET) to try and correct safety problems themselves, if possible, warn others, and call safety when safety problems are identified.

However, on tours, the inspectors observed several potential safety hazards. An inspector observed one employee on the refuel floor of upper containment disconnect an air powered tool that was still under pressure. The employee narrowly excaped injury when the hose and tool flew apart. In several other incidents the inspectors observed personnel working at heights failing to properly use safety belts to preclude injurious falls.

As noted in Appendix 4, NRC inspector observed numerous potential fire hazards in a tour of the welding shop.

Licensee data contained in their September 1988 "Comparative Performances Indicator Report" shows that they do not track the Lost Time Accident Rate for Personnel Involved in Maintenance. However, they did track Industrial Safety Lost Time Accident Rate and Turkey Point's rate was over three times the industry average.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) Procedural safety precautions and implementation of good safety practices in electrical maintenance.

Weaknesses

(1) Inadequate attention to fire hazards in the welding shop

(2) Perceived poor safety practices with regard to the use of air tools and safety belts

(3) Above average Industrial Safety Lost Time Accident Rate

(4) The licensee did not determine their Lost Time Accident Rate for Personnel Involved in Maintenance for comparison with industry averages.

Conclusions

The program described to the NRC team members was perceived as being satisfactory. However, based on the number of unsatisfactory safety practices they observed, the concensus of the NRC maintenance inspection team was that a POOR rating applied to implementation.

4.7 Integration of Regulatory Documents in the Maintenance Program

Rating: NOT EVALUATED

Scope

This element encompasses integration of regulatory documents into the maintenance process.

Findings and Conclusions

The team did not sufficiently evaluate the licensee's integration of regulatory documents into the maintenance process to determine a rating.

5.0 Work Control

Ratings:

Program: SATISFACTORY

Implementation: POOR

This area represents maintenance work control processes. For NRC inspection it was defined to include maintenance in progress (i.e., actual work activity performance), work order controls, equipment records and history, job planning, work prioritization, maintenance work scheduling, backlog controls, maintenance procedures, post maintenance testing, and completed work control records.

The team determined that the licensee's programs for work order control and job planning were well documented and had few apparent weaknesses. Therefore, their programs were rated GOOD. The programs for the other elements evaluated were found to be not quite as complete and well defined, but were considered SATISFACTORY. Having weighed the assessments for the individual programs in this area, the team concluded that the overall program rating was satisfactory.

The team found evidence of inadequate implementatiom of work order control, job planning, work scheduling, and maintenance procedure programs; which led them to conclude that implementation in the work control area should be rated POOR. Important weaknesses that contributed to this rating included an apparent lack of supervisory oversite of maintenance related work, inadequate recognition of parts availability problems in planning, failure to properly identify rework, historical data not being effectively used, inefficient handling of clearances, and inadequate validation of procedures.

The inspection and assessment of the elements of this area are described below.

5.1 Review of Maintenance in Progress

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope and Findings

This element encompasses the performance of maintenance work and was inspected through direct observation of work in progress, interviews with involved personnel, and review of the associated documentation. The documentation reviewed and personnel interviewed are listed below and/or in Appendices 1 and 5.

Maintenance observed in progress and related findings determined during this inspection are described below under the category headings "Electrical maintenance", "Mechanical maintenance", and "Summary of STRENGTHS and WEAKNESSES".

Electrical maintenance:

Portions of various ongoing electrical maintenance activities were observed during the course of the inspection period. While observing these ongoing activities, the NRC inspector attempted to verify that requirements and good practices were adhered to in all facets of the work control process. Ongoing activities observed included, but were not limited to, the following: 7.5 KVA vital inverter preventive maintenance, 4 KV motor connections, reactor trip breaker bracket changeout, 480 V ground fault trouble shoot, MOV wiring modification, MOV limit switch adjustment, instrument air dryer preventive maintenance, and insulation resistance measurement on main generator. For a few of these work orders, the clearance tag log in the control room was verified. Each of the observed activities was being conducted under approved work orders. Procedures were being followed step-by-step, data was being carefully recorded and steps initialed. It was observed that the lifted lead/installed jumper control sheets were being properly utilized. It was determined that procedures were in place to control fuse and parts replacements. For a few of the observed activities, the qualifications of the journeymen performing the work were checked by the inspector. In summary, as far as could be determined by review of electrical maintenance in progress, work performance control at Turkey Point is adequate.

Mechanical maintenance:

An inspector observed mechanical maintenance being performed on pumps and valves, as described in 4.4 above. His findings, were limited to negative observations as to the lack of licensee precautions for assuring that foreign materials were not introduced into open systems.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

No positive feature of work in progress appeared so significant as to be termed a STRENGTH.

Weaknesses

It appeared that the licensee was not taking adequate precautions to preclude introduction of foreign materials into piping systems (e.g., the Reactor Coolant System).

Conclusion

No significant STRENGTHS or WEAKNESSES were identified in inspection of electrical maintenance in progress. Based on a team member's review, described above, electrical maintenance in progress appeared SATISFACTORY. Other maintenance in progress was not inspected extensively, although a team member did note one weakness in mechanical maintenance. It was determined that due to a lack of extensive observations, this element was assigned a NOT EVALUATED rating.

5.2 Establish Work Order Control

Ratings:

Program: GOOD

Implementation: POOR

Scope

This element encompasses the work order process utilized to control identification of maintenance work, performance and recording of maintenance work, and the tests and inspections needed to assure proper completion of the work.

The NRC inspection and assessment of this element was conducted through interviews with personnel and review of documentation identified below and/or in Appendicies 1 and 5.

Findings

(a) The work order documentation (Administrative Procedure 0-701) was reviewed and found to be relatively well documented. The work order process is a computerized system that incorporates a large number of very useful tools for the planners, system engineers, maintenance engineers, and management to use in the course of their normal work scope.

(b) The equipment history files for each of the systems for the past four to five years are included in the computer database.

(c) It has the capability to track equipment as individual items.

(d) It automatically identifies a system or component that is NPRDS related and/or EQ related as soon as the component is entered into the work order process.

(e) It is presently being upgraded to include all of the warehouse inventories of spare parts to assist the planners in the pre-planning stages to ensure the materials needed for the work are available or need to be ordered.

(f) Not all of the maintenance planners were actually using all of the available resources to plan their work packages.

(g) Training of the individuals who have to use the work order system on a routine basis doesn't appear to be of a sufficient quantity/quality or possibly of sufficient depth to impress upon them the total capabilities of the system before they actually start using it. There appeared to a possible problem in the area of the planners not using all of the available resources when planning a job in that there were repairs made to the same component of the IAS several times and the work orders (one of which was WA881019103144) were all identified as first time repairs. In this case there was a piece of tubing that had burst and needed to be repaired and the trendable condition was not identified. Several work orders which were identified as something other than trouble/breakdown work were identified by the inspectors as trouble/breakdown requests (WA881112044056 valve failed LLRT,coded as non breakdown; WA881009065534 repair packing leak, coded as Planned Misc.; WA881009065858 repair packing leak, coded as Planned Misc.;WA880812141706 too much moisture in desiccant, coded as non trouble/breakdown).

(h) The inspectors were informed that the journeyman section of the PWO had been expanded on Nov. 7, 1988 to allow all of the work description and findings of the workers to be entered into the system so that the machinery history portion of the system could be better maintained and more readily available for the planners to use when preparing work packages. Procedure 0-ADM-701 requires entry of journeyman's work reports into the computer. However, the data entry technicians had not been instructed to include all of the journeyman's work write-ups in this section of the computerized inputs and the inspectors found that a significant amount of each journeyman's work report was being omitted and could only be accessed through hard copy records. The aforementioned observations may be indicative of insufficient training in what's available, or possibly in the lack of understanding that all of the personnel involved in the preparation and completion of the work order packages, including the final configuration prior to being placed into document control, are required to prepare and complete the work order packages in verbatim compliance to the Administrative Procedure 0-ADM-701. The noncompliance with ADM-701 is identified as an example of procedure noncompliance which is cited in Violation 250,251/88-32-02, Procedural Related Deficiencies.

(i) The system does not lend itself to easily or readily being capable of identifying the status of work orders in the field and, therefore, it is extremely difficult to accurately assess the total maintenance backlog. In addition it is extremely difficult to determine when a work order has been completed and if it has received all of the required reviews to accept the maintenance work that was performed even though the system is designed to supply that information (This situation would improve if a PWO was classified as Finished when the work is completed and the review process has started and classified as Coded when all the reviews are completed and the package is ready for records storage). Coding difficulties appear to be due in part to the fact that the planners are the same personnel that have to ensure a package is ready for closeout reviews and after it has received all of the necessary reviews determine that it's ready for document storage. If the planners are busy trying to prepare work order packages for the existing outage then all of the completed ones tend to get left lying in an in-basket waiting for the planners to give them to the data entry technician so they can make the finished entries and send them to the appropriate document reviewers and then make the final coded entries and send them to the proper retention files.

Conclusions

The team consensus was that the program (which is outlined in ADM-0-701) for the work order process is a very GOOD program and is improving with each new enhancement the licensee adds to the system, but the implementation of the work order process requires more attention to ensure that everyone involved in the process thoroughly understands and uses the process to its maximum capabilities. The team agreed that implementation was POOR. The basis for this is that there were too many work orders reviewed that were incorrectly documented in accordance with the licensee's program and that additional training in the use of the system appears warranted.

5.3 Maintain Equipment and History Records

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the maintenance of equipment history records for use in trending and root cause analyses.

The NRC inspection of this element was conducted through review of procedures and and selected PWOs and through interviews with licensee personnel involved in generating and/or using the records. The personnel interviewed are included in Appendix 1 and the procedures reviewed are identified in Appendix 5.

Findings

(a) The equipment history records are being maintained in the Nuclear Job Planning System (NJPS), which is an integral part of the computer system, and they are accessible by the planners.

(b) All of the planners have been informed and have received some training on the NJPS system.

(c) The maintenance work orders do track repair times and these are the documents that become the equipment history records.

(d) All of the maintenance history records are correlated with the Master Equipment List (MEL) because it is also an integral part of the computerized work order process system and it is kept current.

(e) All of the NPRDS equipment is automatically identified by the computer system as soon as it is entered on a PWO and the NPRDS coordinator reviews all completed PWOs that have been identified as being NPRDS related work activities.

(f) The data for the equipment history is as yet relatively unorganized but the system is undergoing an enhancement that will allow it to retrieve and organize all of the available data by equipment and/or system including all of the data that has been previously entered and not categorized.

(g) Although the system has the ability to supply the various system engineers and maintenance engineers with trending data, the data has not been getting entered into the system with enough consistency to ensure a highly reliable data base from which to extract information. This has been due, in part, to the fact that until the computer space was increased for journeyman work input the data entry technicians were paraphrasing and it was difficult at best to determine what was significant system work. Therefore, these personnel have not and are not yet utilizing this capability of the system as yet.

(h) It does not appear as though any of the maintenance records are being used in any root cause analyses and this may be a result of the perceived indication that a good deal of repair work is accomplished without any real efforts being undertaken to determine root cause failures even though, the PWO does require the journeyman to at least make an assessment of what may have caused the failure in the first place.

(i) There did not appear to be any indication that the training department was putting any emphasis on the use of maintenance history and equipment records by anyone on a daily basis.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) The MEL is an integral part of the computerized work order process system that maintains the historical records.

(2) The system automatically identifies NPRDS equipment.

Weaknesses

(1) Apparently insufficient training in the use of the equipment maintenance history records.

(2) Very little use of the historical data for determining root cause of equipment failures.

(3) Inadequate entries of historical data in the system.

<u>Conclusions</u>

The consensus of the team was that the program was in place and was SATISFACTORILY documented and the implementation of the program was in place and was SATISFACTORY but could use some strengthening in several areas.

5.4 <u>Conduct Job Planning</u>

Rating:

Program: GOOD

Implementation: POOR

<u>Scope</u>

This element encompasses the licensee's maintenance work planning.

NRC inspection of this element examined and assessed procedural controls for job planning to determine if they included items such as: impact on safety, coordination of activities, completeness of

work packages, sequencing of job activities, tool/part availability, specific processes required to perform the work, qualifications and assignment of personnel to do the work, and, do the controls allow for early coordination with the technical support groups.

The inspection was conducted through a review of procedures and interviews with licensee personnel. The procedures reviewed and personnel interviewed are identified in Appendices 1 and 5.

Findings

(a) The entire PWO computerized system is a definite advantage for anyone trying to adequately plan a job because of its built-in access to virtually all of the history, system identifications, component descriptions, and special interest identifiers.

(b) The system is continually being enhanced to create even more reliable and updated data bases.

(c) The inspectors perceived that job planning is being accomplished without the planners utilizing all of the available resources captured within the PWO computer system as a routine maneuver.

(d) Planners are not accessing the data bases to identify whether a job is rework, is becoming a possible trend, or to make a determination if this work may have been performed under another component classification. In reviewing completed PWO packages the inspector noted several jobs that appeared to be rework candidates. When he questioned the planners about the apparent rework he was informed that the PWOs were identified through different components and, therefore, were not recognized as possible rework or trends.

(e) The NRC inspector found that the estimated hours that the planners were assigning to a particular work order may not be indicative of the time previously taken to perform the same work. The inspector noted several PWOs which had actual hours logged that differed greatly from those estimated for the job (WA880812141706, WA880611521, and WA880922025655) but for which there was no supervisor justification entered on the completed PWO as required by the PWO procedure.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The computerized job planning system has built in access to important data such as equipment history, system identifications, component descriptions and special interest identifiers.
Weaknesses

(1) Generally, planners are not sufficiently accessing the job planning system data bases to identify whether a job is rework, is becoming a trend, or to determine if the job may have been performed previously under a different component classification.

(2) Failure to assess inaccuracies in estimated work hours following job performance.

Conclusions

The team consensus was that the program for job planning was GOOD and should be capable of supplying a strong planning system, but that the implementation of the program requires a great deal more involvement by management to ensure that it is implemented to achieve its design capabilities. The implementation was assigned a POOR rating.

5.5 Perform Work Prioritization

Ratings:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the process whereby work priorities are assigned.

Factors considered in NRC inspection and assessment of the licensee's work prioritization included determinations as to whether their priorities were based on PRA criteria and safety significance and whether effects on safety were considered in assigning priorities to balance of plant (BOP) work.

Inspection of this element was performed through review of documentation identified in Appendix 5 and through interviews with personnel included in Appendix 1.

Findings

(a) No work orders were identified that had been incorrectly prioritized.

(b) All of the work identified as emergency or unexpected appeared to be getting worked in a reasonable period of time with the proper prioritizations being applied as necessary.

(c) There is no plant specific PRA and therefore the work prioritization cannot be PRA influenced.

(d) There are enough new and unanticipated maintenance activities ongoing that there are some very old PWOs that are of a significantly low priority (there seemed to be a significant number of these on the IAS) that have been awaiting available work time to the point that the conditions have become "normal" and the operators have learned to operate around them. This could possibly lead to an indifference by the operators to continue to identify small discrepancies that they can learn to live with. This in turn could lead to more significant problems occurring to the system that may have been prevented had the original problems been resolved.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

It appeared that the documented prioritization process was being consistently followed.

Weaknesses

(1) PRA is not used in prioritizing work as the license does not have a PRA for their plant.

(2) It appeared that too many old low priority work orders were being permitted to remain uncompleted.

Conclusions

The consensus of the team was that the program was adequately documented and the implementation of the program was adequate although there were some areas that could be improved upon.
The team rated both the licensee's program for this element and its implementation as SATISFACTORY.

5.6 Maintenance Work Scheduling

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope

This element represents the licensee's work scheduling process, which was inspected by examining PWOs, schedules and assignments and through interviews with involved personnel.

The NRC inspection and assessment of this element was conducted to determine if the maintenance scheduling process adequately enhances the maintenance activities, and controls the backlog of maintenance work. Personnel interviewed and procedures reviewed relative to this element are included in Appendices 1 and 5.

Findings

(a) The licensee has established several new scheduling groups to enhance their ability to adequately schedule work on a daily as well as an outage basis.

(b) There is a daily plan-of-the-day (POD) meeting where everyone is informed of the work status from the preceding day or morning and exactly what is scheduled to be worked this day and what types of holdups can be expected.

(c) The licensee puts out a very comprehensive POD that can be used to track ongoing work activities.

(d) The schedulers for the outages did not appear to actually acknowledge that the smallest organizations that must support the maintenance activities are the true bottlenecks of the system and therefore need to be the ones the schedules are created around.

(e) It was perceived by the inspector that the schedulers were overly optimistic about available craft time they had to work with on a daily basis and therefore were actually scheduling more work than could be accomplished in a given time period (when asked how much work time they thought was actually received in a shift, planners informed the inspector about 70% or about 5.5 hours for an 8 hour shift, and when asked how much work time was scheduled for non trouble/breakdown work he was also told 70% of the shift hours. This appeared to leave no time for daily trouble/breakdown work).

(f) It was difficult to determine from the POD meetings exactly what items were critical path work for the day or for the outage, and who was actually driving the schedule to ensure everything was going as planned and that any conflicts that arose were handled in the most expeditious and productive manner.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

No characteristics of the licensee's scheduling were identified as STRENGTHS or WEAKNESSES.

Conclusions

No apparent STRENGTHS and WEAKNESSES were identified in the licensee's scheduling of maintenance work. A review of the findings indicates that this element was not evaluated in sufficient detail to provide a rating. Therefore, the program and implementation for this element have been designated NOT EVALUATED.

5.7 Establish Backlog Controls

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the process established to control the backlog of maintenance work.

The NRC inspection of the element was directed toward determining how the maintenance backlog is controlled and whether:

- written justification and approval is required for deferral
- prioritization and time limits are applied to deferred work
- ALARA is considered for radiation exposures
- the maintenance staff is sufficient to control backlog
- the safety importance of BOP deferrals is considered
- backlog is reduced on the basis of prioritization
- the backlog is measured and assessed (trended and size considered in estimated man hours and number of work orders)

The inspection was conducted through review of licensee Maintenance Department Performance Indicators and interviews with personnel who are identified in Appendix 1.

Findings

(a) The licensee has instituted a rigorous approach for identifying and controlling or bringing under control the large number of backlogged work orders (as indicated by the number of trending graphs that were available for the team's inspection).

(b) Deferred work orders were found to require management approvals for deferment and as the deferment time increases so does the level of management approval required to continue the deferment.

(c) The total number of backlogged work orders has been reduced considerably over the past 6 months (as indicated on the licensee plots which are upgraded at least monthly).

(d) The methodology developed to measure the ratio of corrective to preventative maintenance relies significantly on the code category assigned to the work orders by the planners and there were several instances (refer to section 5.2) identified by the inspectors that tend to cast an element of doubt as to the validity of the current trends developed.

(e) The program is still in its infancy.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

No STRENGTHS or WEAKNESSES were identified.

Conclusion

Having weighed the significance of the above findings, the team consensus for this element was that the program for the control of backlogged maintenance is in place and is adequate and the implementation of the program was adequately in use. The program and implementation are rated SATISFACTORY.

5.8 Provide Maintenance Procedures

Rating:

Program: SATISFACTORY

Implementation: POOR

Scope and Findings

This element encompasses the process of providing maintenance procedures.

NRC inspection of the element was conducted through review of maintenance procedures and controlling administrative procedures and through interviews with licensee personnel involved in preparation, review and use of maintenance procedures.

Several NRC inspectors assessed the licensee's process for providing maintenance procedures. The inspection they conducted is divided into the two priciple areas, electrical maintenance and mechanical

maintenance. Details of the inspection and findings for each area are provided below followed by a Summary of the STRENGTHS and WEAKNESSES identified. Documentation reviewed and personnel interviewed relative to each area are identified below and/or in Appendices 1 and 5.

Electrical maintenance:

Considerable inspection effort was expended in reviewing the electrical preventive maintenance procedures at Turkey Point. This inspection effort was directed at answering two questions:

(a) Were there procedures in existance to cover all the normal preventive maintenance activities that should be governed by procedures?

(b) Were the procedures of sufficient quality to be considered acceptable for maintenance work at a nuclear power plant?

Question (a) was addressed by studying the index of procedures and discussing with the Assistant Superintendent for Electrical Maintenance, the Assistant Superintendent for Planned Maintenance and the Predictive Maintenance Coordinator for Planned Maintenance any apparent gaps that could be discerned from the index. Question (b) was addressed by detailed review of three electrical procedures (discussed below), by witnessing maintenance work (refer Section 5.1) and by discussions with electrical craftspeople and the Assistant Superintendent for Planned Maintenance.

During the interviews with the Support Supervisor for Electrical Maintenance and the corporate Manager of Nuclear Maintenance, the inspector learned that several different independent groups perform electrical maintenance work at Turkey Point. Each of these groups uses procedures that were developed independently, but all these procedures were either subjected to the plant review process or developed under an approved Quality Assurance program. The Electrical Maintenance Production Section (there are also Planning and Support Sections) is responsible for performing nearly all corrective and preventive maintenance within the turbine generator and reactor areas. The NRC inspection focused on procedures used by the Production Section. The FP&L Substation Group maintains the switchyard and power transformers. The Substation Group operates independent of the plant, except that their work must be coordinated with plant outages. Virtually no attention was focused on this group during this inspection. Protective relays for the 4160 Volt system are calibrated and tested by the Electrical Maintenance Support Section. Their calibration and test program, as described by the supervisor, is acceptable, and is discussed further in Section 6.1.2, "Electrical Maintenance." Extensive overhauls and major modifications are performed by outside companies under contract, and are discussed further in Section 6.2, "Establish Control of Contracted Maintenance."

The Electrical Maintenance Production Section has, for its use, a total of 65 upgraded preventive maintenance procedures and 6 upgraded general maintenance procedures (e.g., troubleshooting and bus grounding). The upgraded preventive maintenance procedures are tabulated below:

Associated Equipment	Quanity of Procedures
DC Systems	10
4.16 KV switchgear and associated relays	6
480 V load centers and associated relays	5
Motor control centers	5
Cathodic Protection System	2
Motors	10
Recorders	4
Emergency diesel generator	1
Motor operated valves	2
Miscellaneous systems and equipment	23

In addition to the upgraded procedures mentioned above, the plant also has numerous older style procedures.

Procedure 0-PME-005.3 (upgraded), "4160 V General Electric Breaker Inspection and Cleaning" was reviewed in detail. This procedure, which is for vertical lift type circuit breakers, contained all of the inspection and cleaning steps that are considered standard industry practice for this type of equipment, except that the procedure did not call for inspecting the control relay contacts. Checking of primary contact resistance is considered optional by industry. Since the procedure called for checking primary contact resistance, this is considered a strength. Procedure 0-PME-005.6 (upgraded) "4160 V A and B Bus Inspection and Cleaning" was reviewed in detail. The 005.6 procedure clearily defined the individual tasks to meet the objective, incorporated appropriate safety precautions, and incorporated independent and supervisor verification points. The procedure called for a final megohmmeter check after all cover panels (except one) are replaced to help detect problems that could have

been caused by the inspection itself, such as tools that may have been left inside the enclosure. Therefore, overall, the procedure was considered good, however, the NRC inspector had the following comments:

(a) The procedure should incorporate steps for checking bus bar connection and support bolts. Care must be taken to include sufficient detail in these steps.

(b) A criteria should be given for the insulation resistance measurement, and this value could be trended by Systems Engineers.

Procedure MP 9407.3 (older format) "4160 Volt A and B Bus Switchgear Cubicle Component Inspection" was briefly reviewed, and the inspector had the following comments:

(a) The procedure should include a check that the space heaters are operable.

(b) The procedure should include a check of the ventilation fans.

(c) Steps should be added to inspect the potential transformer, reactor and system grounding equipment compartments.

The MP 9407.3 procedure was considered adequate for use, but should go through the Procedure Upgrade Program to ensure that it meets all the criteria and standards imposed by that program.

Motor preventive and predictive maintenance is not fully addressed by procedure. Even though the index of procedures includes ten procedures related to motor maintenance, these procedures are for specific tasks on specific motors. The preventive maintenance of many important motors is not covered by procedure. However, the "Five Year Unit Overhaul Planning Subsystem," which is used for scheduling and cost estimating of outage work five years ahead, includes preventive maintenance of motors. This system causes work orders to be generated for preventive maintenance on important motors. The work order then includes a motor inspection instruction. A sample of these type work orders was examined during the inspection. The adequacy of the entire approach to motor preventive and predictive maintenance is marginally acceptable. This fact, however, is not considered a programatic weakness because, the industry has been slow to define what maintenance is actually needed on motors.

The NRC inspector solicited the opinions of journeymen and foremen on the adequacy of the "new" procedures. These discussions revealed that the topic of procedures was a sensitive one among the craftspeople. Apparently, the issuance of many new or totally rewritten procedures within a relatively short period of time,

together with explicit instructions for verbatim compliance, was causing problems. The NRC inspector attempted to determine the nature of the problems. Two examples of inadequate procedures were cited: First, the fire pump diesel generator starting battery surveillance procedure effectively called for overfilling the battery. Craftspeople questioned the procedure, but the problem could not be resolved before the battery failed surveillance test and was replaced; Second, a new procedure for trouble shooting was developed by the I&C group, for the I&C group. However, the procedure was issued for Joint I&C and Electrical use. Therefore, for a period of time until the procedure could be modified, the Electrical craftspeople did not have a useable troubleshooting procedure. Several electrical procedures contained individual steps that were unworkable, which caused a slowdown or stoppage of work progress.

Maintenance managers were aware that the problems described above had occurred, however, it could not be determined whether or not the cause has been corrrected.

The inspector inquired of the Assistant Superintendent of Planned Maintenance whether or not a procedure was issued for the conducting of high-potential test. Periodic high-potential testing of cables and equipment was not a part of the maintenance program, however, the need for performing an occasional test may arise. In response to this inquiry, the licensee presented a copy of a self-study module which covered the operation of the DC high potential tester. Apparently, completion of training is a substitute for a detailed procedure in performing high potential test. This is acceptable if the training has been recent and the work order specifies the test voltage, connections and provides a data sheet.

The fact that the maintenance program does not include protective trip testing of molded-case circuit breakers is considered a weakness by the inspector. In addition, since problems have occurred in the recent past, upgraded procedures may not be subjected to "walkthroughs" by the users before being issued.

Mechanical maintenance:

In reviewing the mechanical maintenance procedures identified in Appendix 5, two procedures appeared to be inadequate:

(1) O-PMM-022.3 Emergency Diesel Generator 18 Month Preventive Maintenance, Revision of October 24, 1988.

    Revision of this procedure had been accomplished through the Procedure Upgrade Program (PUP) and in anticipated conformance to upper-tier controlling procedures (O-ADM-100,127, 201, 500, 710, and AP-0109.1 and 0109.7).

However, O-PMM-022.3 was deficient as revised in that it failed to delete requirements regarding chromate water which are no longer applicable. Also, it failed to delete major modifications (power pack assembly, cylinder liner installation and measurement, cylinder head installation, and lube oil cooler) which will not be required for several subsequent 18 month intervals.

(2) MP-0703 Maintenance of 2" and Larger Copes-Vulcan Air Operated Control Valves, Revision of September 17, 1986.

The current revision of this procedure predated the PUP. However, the revision had been reviewed by the Plant Nuclear Safety committee (PNSC) and approved by the Nuclear Plant Manager.

MP-0703 was deficient as revised, due to inclusion of a note after section 9.15 as follows:

"Note: If a hydrostatic test is to be performed, use TABLE 1 for initial torque. After hydrostatic test, loosen bolts one at a time and retorque to values prescribed in TABLE 2" (TABLE 2 torque valves were lower than Table 1).

The note effectively requires bonnet stud nuts to be torqued to higher values (for hydrostatic testing) then loosened and retorqued to lower values (no less crush on bonnet gasket) after hydrostatic testing is completed. This requirement is considered to be technically incorrect.

Cognizant licensee personnel were unable to explain the failure to adequately revise the procedure in (1) above. However, they were able to reduce NRC concern related to adverse effects on components in (2) since O-PMM-022.3 had not been used since its October 24, 1988 revision and Copes-Vulcan vendor information was obtained, which indicated that gasket crush would not be adversely affected by adherance to the note in MP-0703.

The inspectors informed cognizant licensee personnel that the procedural deficiencies referred to in (1) above would be identified as a part of violation 250,251/88-32-02, Procedural Related Deficiencies.

Additional Findings Regarding Maintenance Procedures are as Follows:

(a) The licensee is in the process of upgrading (through the Procedure Upgrade Program) all of the maintenance procedures in an attempt to bring them to a standard that the craftsmen can rely on for the correct performance of their jobs.

(b) The procedures supplied to the crafts personnel do not always work as required and the craftsmen have to spend a great deal of time getting on the spot changes (OTSCS) written and approved before they can continue with the job.

(c) Recently, procedures have been issued for joint craft use (I&C/Electrical Trouble Shooting) that have not been compatible for use by both crafts and these procedures were very slow in getting modified or replaced even though the crafts line management knew the problem existed.

(d) In reviewing both old style and new upgraded procedures the inspectors identified weaknesses in both that may be indicative of insufficient technical review of these procedures prior to issuance. This is exemplified in the deficient procedure referred to previously in (1).

(e) During interviews with various crafts personnel the inspectors noted that there appears to be some significant concerns about verbatim compliance with procedures. This may be indicative of insufficient training to impress upon the craft personnel exactly what is expected and required of them for verbatim compliance or of a more significant issue that the craft personnel are not comfortable with the quality of the procedures being supplied to them.

(f) In discussing the procedure preparation process with the manager of the Procedure Upgrade Program group the inspector was concerned with the situation that the authors of these procedures are not always experts for the systems or activities that they are preparing procedures for and they rely heavily upon external reviews by technically competent personnel which are assigned to the procedure. Additionally, there is no group review of the comments received on the procedures but only one-on-one discussions by the author and the individual that provided the comments. This type of incorporation can become extremely frustrating to the author if he has conflicting inputs and neither inputter wants to relinquish his position. Usually the author will attempt to decide which one has a more authoritative position as far as the procedure goes and he will then go with that individual's comment (even though it may be technically in error due to some oversight that neither is aware of). Group reviews tend to get all of these type of issues resolved for the good of the procedure and they also allow others to personally receive input of varying perspectives which does a lot to preclude oversights in the procedures.

(g) The perception that the inspector received during this interview was that the system engineers are not always involved in the procedure preparation process as much as they should be and with the knowledge that these individuals possess they should be the most technically qualified persons to be authoring and/or reviewing all the procedures being developed for their systems.

(h) When the procedures are being validated there is no requirement that there should be a relatively inexperienced worker as well as an experienced worker walking the procedure down so that both perspectives can be received on how well the procedure is worded to preclude as much misinterpretation as possible.

STRENGTHS AND WEAKNESSES FOR THIS ELEMENT

Strengths

The licensee has undertaken procedural upgrading which includes a validation process.

Weaknesses

(1) No procedures for protective trip testing molded-case circuit breakers.

(2) Procedural deficiencies resulting from an inadequate review and validation process.

Note: For examples found, it did not appear that incorrect maintenance would result. However, the errors appeared to hamper maintenance performance.

Conclusions

The team consensus for this element is that the program is in place and is SATISFACTORY, but that the implementation of the program is POOR and is in need of additional management oversight. The basis for the POOR rating for the implementation is the fact that in reviewing procedures the inspectors found errors and in conducting interviews with various craft personnel there was a general feeling of distrust in the procedures being supplied to them for performance.

Procedural deficiencies referred to above are being identified as additional examples of NRC Violation 250,251/88-32-02, Procedural Related Deficiencies.

5.9 Conduct Post-Maintenance Testing

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope

This element encompasses the post maintenance testing utilized to verify satisfactory operability of equipment following maintenance.

The NRC inspection of this element was to determine whether the licensee had adequately documented and implemented criteria for performance of post maintenance testing.

The inspection performed was primarily limited to a review of the applicable procedures: 0-ADM-714, Conduct of Post Maintenance testing and AP-0190.28 Post Maintenance Testing.

Findings and Conclusions

Although it appeared that the procedures reviewed lacked sufficient detail regarding post maintenence testing requirements, neither the program nor its implementation were reviewed in sufficient detail to provide a useful assessment. Both the program and implementation ratings were designated NOT EVALUATED.

5.10 Review of Completed Work Control Documents

Ratings:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope, Findings, and Conclusions

This element encompasses licensee processing of completed work control documents. It was not assessed in sufficient detail to justify a rating.

6.0 Plant Maintenance Organization

Rating :

Program: SATISFACTORY

Implementation: SATISFACTORY

This area represents the processes by which the plant maintenance organizations control, support, and direct maintenance activities.

The team consensus, as indicated by the above rating, was that both the program and implementation in this area were satisfactory. Though a number of apparent STRENGTHS and WEAKNESSES were noted by the team, none were considered noteworthy enough to single out as having particular influence on the ratings. However, the team did note that the electrical maintenance subelement was functioning particularly well and, as a consequence, was rated GOOD for both program and implementation.

6.1 Establish Control of Plant Maintenance Activities

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

This element encompasses the role that the mechanical, electrical and instrumentation and control organizations have in controlling maintenance activities in their respective areas. Each of the three organizations, their activities and the team's inspection and assessment of their activities relative to this element are discussed and rated below. Based on their assessments, the team consensus established the rating noted above.

6.1.1 Mechanical Maintenance

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope Findings, and Conclusions

This subelement represents the controls which the mechanical maintenance organization utilizes to assure that its activities are properly accomplished. There was insufficient inspection to assess either program or implementation for this subelement. Therefore, it was assigned a NOT EVALUATED rating for both program and implementation.

6.1.2 Electrical Maintenance

Rating:

Program: GOOD

Implementation: GOOD

Scope

This subelement represents the controls, which the electrical maintenance organization utilizes to assure that its activities are properly accomplished.

Inspection and evaluation of the subelement was performed principally by the electrical specialist on the NRC maintenance inspection team.

Findings

In performing his inspection of this element, the NRC inspector reviewed the Component Work History Reports for the Unit 3 4 KV and 125 VDC systems. The purpose of reviewing these reports, which covered the past two years, was to look for any repetitive failures. The repetitive failures identified from this review were:

(a) 23 work orders to correct mechanical problems with the safety-related 4.16 KV switchgear. These work orders were written for problems like a broken pin on the spring discharge cam, incorrect alignment, broken spring discharge, etc.

(b) 17 work orders to correct problems with fuses and fuse holders mounted in the 4.16 KV switchgear control compartments.

(c) 15 work orders to trouble shoot problems with the inverter (or inverter related equipment) synchronism indicating light.

Other information was also obtained through study of the Component Work History Reports. First, two work orders were written to trouble shoot hard grounds on the DC system. The two work orders were closed in two days and twenty days respectively. Second, there were not any ground faults on the 4.16 KV system in the last two years.

The significantly large number of work orders to correct mechanical problems with the safety-related 4.16 KV switchgear is attributed to the relative age of the switchgear. The licensee stated that they were planning to have all the 4.16 KV safety-related circuit breakers completely overhauled. Licensee personnel stated they were dealing with the fuse and fuse holder problems by instituting a replacement of all the affected equipment with new equipment. The inverter synchronism, indicating-light burnout problem was not addressed as a repetitive failure by the licensee. The conclusion that the NRC Inspector drew from his review of the corrective maintenance work history on the two selected electrical systems was that repetitive failures of electrical equipment had not been a problem at Turkey Point.

Another indicator that was used to help evaluate the electrical maintenance was statistics on outstanding corrective maintenance. A printout of all outstanding corrective maintenance work order data listed by priority was obtained. The numbers of unfinished work orders are tabulated below for the three highest priorities.

UNFINISHED WORK ORDERS

ELECTRICAL SYSTEM CORRECTIVE MAINTENANCE

PRIORITY	NUMBER OF WORK ORDERS		
	UNIT 3	UNIT 4	COMMON
A	2	6	1
B	26	14	24
C	56	29	25

Other statistics obtained from the printout of outstanding work orders is as follows. There were 25 outstanding work orders for the Heat Tracing system, 14 for the Cathodic Protection system and thirteen for replacing switch protective covers. The remaining work orders are randomly distributed, covering a wide range of problems and minor deficiences. The total amount of outstanding electrical corrective maintenance work at Turkey Point is considered reasonable for a nuclear power plant and electrical work backlog appeared under control. In addition, review of the types of problems in the backlog did not indicate that system operation is being affected.

The inspector observed that the electrical maintenance organization appeared effective in ensuring the integrity of the electrical systems although there were some weaknesses in this area. The batteries are only about three years old, the recommended maintenance has been performed on them and there has been no history of hard grounds on the DC System. System engineers track the lowest cell voltage, lowest specific gravity, etc. using line plots. On the other hand, battery performance tests are not being carried out. IEEE Std 450-1975 and 1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations," calls for periodic performance tests to determine whether the rating of the battery is holding up. IEEE Std - 450 states that performance tests of battery capacity should be made within the first two years of service. Additional performance tests should be given to each battery at five year intervals until it shows signs of degradation. Once degradation is noticed or 85 percent of sevice life is reached, annual tests should be conducted. The real purpose of the periodic performance test is to predict when the knee of the aging curve has been reached. The service test, or load profile test, called for in the Turkey Point Technical Specification, is not as useful as the performance test in predicting the degradation of battery capacity. Therefore, the lack of performance test information may become important as the battery gets older.

In terms of maintaining electrical system integrity, other statements can be made. The inverters are relatively new, and are considered reliable. 4.16 KV bus bars are inspected and megohmeter readings made to detect possible deterioration. The protective relay system for the 4.16 KV system is well maintained. They perform the following checks at nominal eighteen month intervals:

(a) Calibration and functional checks
(b) Trip coil check
(c) Insulation resistance check and excitation test on current transformers.

The environmental qualification program has been fully implemented, and the maintenance organization ensures that equipment remains in a qualified condition. Most rooms and areas of the plant are quite compact. As a result of the narrow walkways and tighter clearances between control panels, switches have been inadvertently bumped and operated by operators and maintenance people. In order to prevent these kinds of occurrences from happening in the future, Turkey Point has made extensive use of protective covers over switches mounted on the front of control panels and switchgear.

The procedure for preventive maintenance on the 480 V motor control centers includes maintenance on the molded-case circuit breakers such as visual inspection and mechanical operation of switch. However, the maintenance program does not include verification testing of the overcurrent characteristic of the 480 V molded-case circuit breakers. The lack of such tests is considered a weakness in the program. Even though regulations and standards do not specifically call for overcurrent characteristic tests on molded-case circuit breakers, the NRC considers periodic testing important to ensuring the automatic trip mechanism is functioning, which, in turn helps ensure system integrity.

The licensee is using qualified persons to perform the electrical maintenance work. The plant policy being implemented is to allow only persons who have been judged qualified by the formal qualification process to work independently on any work order. A review of Component History Reports for the 4 KV and 125 VDC Systems revealed only one case where a work order to trouble shoot a problem was prematurely closed-out. This record tends to support the assertion that qualified persons are performing the maintenance work. The NRC inspector's impression, after observing several activities in progress and talking with several crafts persons, is that the workers were qualified to perform their assigned tasks.

Control of materials, (i.e. ensuring that proper components are installed when replacements are necessary) and tools was addressed during the inspection. The NRC inspector did not identify any problems in this area, and believes that proper controls are being observed. Work prodecures include steps to restore equipment and systems to their proper configuration after maintenance work is completed. Accountability for work performance is demonstrated by having journeymen, foremen, and field supervisors sign each work order completion report.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The inspector did not note any particular item in his inspection of this subelement that would be termed a strength, but a GOOD overall program and implementation was generally observed.

Weaknesses

The licensee's program does not include periodic verification testing of 480 V molded-case circuit breaker overcurrent trip mechanisms.

Conclusion

The inspector determined the that electrical maintenance organization is effective in identifying electrical maintenance needs. With few exceptions, damaged or inoperative equipment identified by the Operations Department or during preventive maintenance work was documented so that corrective measures can be taken in a timely manner. Also, the preventive maintenance program is judged to be effective.

In consideration of the above, the electrical maintenance organization was concluded to have work controls which exhibit few weaknesses and a GOOD rating was assigned for both program and implementation.

6.1.3 Instrumentation Control (I&C) Maintenance

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This subelement represents the controls which the I&C maintenance organization utilizes to assure that its activities are satisfactorily accomplished. Inspection and evaluation of this subelement was performed principally by the I&C specialist on the NRC team.

In performing the inspection the NRC inspector held discussions with the various levels of supervision in the I&C maintenance organization from the supervisor to the technicians.

Findings

The organization of the unit is different from that of the mechanical and electrical maintenance organizations. The technicians are assigned to crews with a field supervisor in charge. Work assignments are made by the production supervisor to the field supervisors. The calibration lab is under the supervision of the assistant production supervisor.

The inspector observed the technicians performing portions of various tasks. The following PWOs were reviewed either after completion or while in progress:

8155/64 - Radiation Monitor RD-4-15, detector defective

8242/63 - Radiation Monitor - RD-3-15, Monitor failed high

7796/64 - Leak at solenoid Valve SV-4-6427B

6183/63 - Flow indicator FI-3-5119 and block valve leaking boric acid

7385/63 - Calibrate FI-3-130

6183/63 - Green pen erratic on TE-606

7853/63 - Radiation detection RD-3-12 failed low

6514/63 - Radiation Monitoring Detector RD-3-15 failed

It was noted that PWO 6514/63, which was for repair of a Unit 3 radiation detector used to indicate a steam generator tube rupture/failure, was delayed first for a detector tube and later for the qualified sealing materials. The replacement detector was removed from Unit 4 and installed in Unit 3. The sealing material was on site but was designated for use only in an electrical discipline applications. An engineering evaluation was to be performed to determine if the sealing material on hand could be used for sealing the radiation detector in question. The evaluation was not reviewed by the inspector.

This particular detector has been a trouble item almost from the onset of operation. Its recurring failures were explained to the inspector as being due to the location of the detector and its exposure to slugs of water during load reductions and plant shutdown. The inspector was advised by the licensee personnel that several modifications had been tried but that replacement of the damaged sensor following the shutdown or load shift was the best method of maintenance used to date. One figure quoted to the inspector was that the detector (R-15) monitoring the Steam Jet Air Ejector (SJAE) exhaust had failed 19 times in the first 4-1/2 years of operation of Unit 3. The inspector verified that proper documentation had been established to account for the removal of the detector from Unit 4 and to permit installation in Unit 3.

An examination of the calibration lab was conducted. The calibration program for control of test equipment is within the scope of MI-700, Conduct of Maintenance. Records are maintained for all calibration controlled test equipment indicating the PWOs on which the equipment had been used, the person who checked the equipment out, the responsible supervisor and the length of time the equipment had been checked out. The test equipment can not be checked out to a person unless he is qualified to use it. This feature is also controlled by the computer program. The calibration records for the equipment are maintained on the computer and each day a record is produced that indicates the equipment which is due calibration on that day and can not be used until recalibrated. Recalibration can be required either due to the length of time since last calibrated or the number of times used. A record of the PWOs for which the equipment was used is maintained in the computer until such time as it is determined that the equipment was not found out of calibration when tested. The calibration lab is well organized, clean and the testing area is especially well maintained.

The overall morale of the personnel in the I&C shop appeared good. Discussion regarding the performance of maintenance indicated that PWO completions are often delayed due to lack of qualified parts/materials.

All personnel interviewed were familiar with the temporary systems alteration program and when it is to be used. Additionally, review of new/revised procedures were by the field supervisor and his crew. Records for MI-700 training for the I&C technicians were examined. A problem arose during the inspection regarding the qualification records for individuals transferred from the FP&L St. Lucie site. Until qualification records could be verified those technicians involved will be limited in their assignments. The supervisor of each crew is responsible for insuring that the personnel are qualified to perform the task assigned. It was noted that there is no meeting of the field supervisors to discuss procedures or procedural changes.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The licensee is having the NSSS supplier to overhaul and certify the various control modules in the process control racks.

Weaknesses

(a) There appears to be a problem in obtaining qualified replacement parts.

(b) Field supervisory personnel are lacking in complete supervisory training.

This unit has experienced a higher turn-over rate than other disciplines in that personnel often move from it into the operational training program. The unit is functioning in a satisfactory manner.

Conclusion

The organization as set up to accomplish I&C maintenance appears to function in a satisfactory manner. It should be noted that the I&C supervisor is involved in the day to day operation of the I&C maintenance department at a much more detailed technical level than should be required. The inspector was advised that this was due in part to the lack of training of the field supervisor but that a training program was being developed that would, upon completion, free more of the I&C supervisor's time for his assigned duties.

6.2 Establish Control of Contracted Maintenance

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope

This element encompasses the controls which have been placed on maintenance contractors to assure the adequacy of their work.

The inspection of this element was conducted through a review of documents and interviews with personnel.

Findings

This licensee frequently issues contracts for maintenance when the task will put a demand on the permanent maintenance staff that causes interruption of the normally assigned tasks. The inspector was advised that most of the contracted personnel have been at the site for several years and are familiar with the site safety, radiation, and QA/QC requirements. The maintenance work performed by outside contractors is controlled by the Construction/Backfit Department.

At the time of the inspection, the Mechanical Department had issued purchase orders Nos. B88950-90240 and 90241 to an outside firm to provide the labor, tools, equipment, services, and supervision necessary to perform valve inspections, repairs and repacking of safety and nonsafety-related valves. As part of the contract, training requirements for the contract personnel are specified. In line with this requirement the qualifications of the craftsmen are required prior to receiving the FP&L administered training. The work performed by the contractor is subject to FP&L's QA/QC requirements. Calibration of tools used by the contractor is controlled by the licensee. In some instances the tools are furnished by the licensee. At the time of this NRC inspection Unit 4 was in a refueling outage which involved additional maintenance functions and would place a high demand on the existing maintenance staff. For this reason the Construction/Backfit Department assigned the task of performing the required activities. In addition to refueling activities, the reactor coolant pump motors and seals will be overhauled, the RHR pump motors overhauled and the electrical connections to the pressurizer heaters inspected and repaired.

The Construction/Backfit Department issued contract #FPL-88-845 to the NSSS supplier to perform this work under the vendor's QA/QC program which has been accepted by the licensee. The licensee's Architech Engineer has a standing contract to furnish the necessary manpower as required. The inspector did not request the contract identification.

The inspector examined the training records for the contract personnel for each of the three contracts discussed above. The craftsmen performing the valve inspection/repacking were certified by the supplier of the packing material as being qualified to install this special packing material. The personnel qualifications of the supervisory personnel were reviewed by the inspector and appeared to be adequate. The craftsmen are certified journeymen by the trade union representing them. The licensee gives a series of training courses to insure that the badging requirements are met by each of the craftsmen before they perform any work on site.

Conclusions

The licensee appears to have a satisfactory program to control the qualifications of the contractors who perform work on site and at other locations within control of the contractor, and it appears to be satisfactorily implemented. However, other important aspects of the control of contractors, such as:

- procedural controls to assure proper instructions, documentation and materials are used by contractors
- establishment of a program to monitor performance and monitor accountability
- controls to assure quality contractor work

were not assessed and, as a consequence, this element is being rated NOT EVALUATED with respect to the overall program and implementation.

6.3 Establish Deficiency Identification and Control System

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the methods established for identification and control of deficiencies.

Inspection of the element was conducted principally through review of documentation as noted below in the findings.

Findings

The team reviewed the following nonconformance reports (NCRs) as well as those listed in 3.4 above for completeness, adequate review, and close out.

NCR	SUBJECT
87-0215	I&C fuse inspection Unit 3
87-0216	" " " Unit 4
87-0272	" " " Unit 3
87-0223	" " " Unit 4
88-0011	Air leak at AFW FCV Positioner
88-0012	Pressurizer heatup rate exceeded
88-0028	SV-4-200C wiring discrepancy
88-0104	Wrong gauges installed, Intake Cooling Water System
87-0026	PI not on Q List
87-0003	SAV different from Inst List
87-0045	CVCS PS-201 A, B, and C not EQ certified.

Nineteen other NCRs were reviewed which were generated at least one year earlier to determine that timely closure of items was being accomplished. Closures appeared timely.

There appears to be adequate assessment of NCRs for reportability and, generally, engineering dispositions appear correct. However, NCRs do not appear to be routed to appropriate systems engineers and, as a result, an important input may be missed.
A "green tagging" system for identification of deficiencies is described in the licensee's procedure for work order preparation, Procedure 0-ADM-701. The NRC inspectors observed generally appropriate application of the green tags and proper resolution of the associated deficiencies through performance of plant work orders. An NRC inspector did, however, observe an instance in which proper

correction of an identified instrument deficiency was not accomplished (on pressure indicator PI-1545) because a PWO was erroneously canceled (coded out). This error resulted when a planner apparently checked the wrong instrument and determined, incorrectly, that the deficient condition did not exist. The planner was required by procedure to confirm that there was no deficiency with the orginator. This confirmation was not obtained. This matter is discussed further in 1.2 and provided examples of noncompliance with procedure requirements and missing identification tagging referred to in Violations 250,251/88-32-01 and 250,251/88-32-02.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The apparent absence of errors in recent engineering dispositions of deficiencies.

Weaknesses

(1) Systems engineers are not adequately informed of deficiencies identified in their systems.

(2) A planner's erroneous closure of an instrument deficiency.

Conclusion

The licensee's program for this element was SATISFACTORY, though it could be improved by assuring that system engineers were included in the deficiency review process. The licensee's implementation for this element was also considered SATISFACTORY, though in one instance improper implementation was observed in that work to correct a deficiency was cancelled without proper verification that correction was unnecessary.

6.4 Perform Maintenance Trending

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the establishment of methods for detecting repetitive failures and adverse quality trends. It includes trending on the system, component and part levels; use of root cause analysis; use of self assessment/performance indicators; evaluations of rework and consideration of systematic and other than specific fixes.

The element was inspected through reviews of documentation and interviews with licensee personnel.

Findings

As stated in section 3.5, the licensee trends various performance indicators. Some of the sources for trending data are as follows: Nuclear Job Planning System (NJPS), the Critical Component Program, and the Predictive Maintenance Program. A review of these programs relative to the above criteria indicated that: the NJPS is the plants computerized equipment history program, however, the system is not sufficiently accessible and does not facilitate the access to specific information. The Critical Component Program is only in its infancy and is currently completing analysis of only a few major systems. No evidence of a thorough rework evaluation was demonstrated to the inspectors. The NJPS could provide a tool for rework evaluation, however, it again does not facilitate access of specific information and is not being used in this capacity.

Root cause analysis is being done and the results are being generically applied as applicable. However, this is done at the plant only by specific request of management and programs which automatically initiate root cause analysis (on-site) are only recently developed.

It was found that the licensee did not have a program to trend failures of systems, components and parts and such trending was not performed. Predictive maintenance vibration and oil analysis data is trended.

Based on examinations of PWOs as described in 5.2 above the team determined that the licensee did not appear to have adequate methods of identification and evaluation of rework to determine and address adverse trends.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) Tracking of performance indicators

(2) Trending of predictive maintenance data

Weaknesses

Failure to trend part, component, and system failures

Conclusions

The licensee was considered to have a marginally SATISFACTORY program and implementation for this element.

6.5 Establish Support Interfaces

Rating:

Program: NOT EVALUATED

Implementation: SATISFACTORY

Scope

This element encompasses the communication interfaces the maintenance organization establishes with support organizations to aid it in obtaining needed information, assistance and cooperation.

NRC inspection of this element was conducted only as adjunct observations/reviews of other matters. Plan of the day meetings that were being conducted to aid in communication of important outage work support needs were attended and observed by NRC team members. Interviews with health physics personnel provided some insight on support communications relative to associated planning and scheduling. Discussions of PWOs with planners and a system engineer provided information on related communications. Discussions with maintenance and stores personnel regarding parts problems also provided insight regarding communications.

Findings

The inspectors found that the plan of the day meetings were well-attended and provided a generally satisfactory interchange of information regarding outage work, needs, and responsibilities among various plant organizations. Some NRC inspectors felt, however, that critical path items could have been better identified; and that exchanges during the meetings flowed too much from principle managers down, with large numbers of participants not actively sharing information.

A health physics person had recently been assigned to interface with the maintenance planning and scheduling personnel and interviews indicated that this was aiding in assuring adequate health physics support for maintenance activities.

Discussions with the IAS systems engineer indicated that maintenance was not informing him of potentially important deficiencies identified in his system. This appeared to stem from the licensee's failure to have an adequate proactive systems engineering program.

With regard to parts problems, it appeared that maintenance personnel had inadequate communications with the warehouse operation such that deficiencies in numbers of parts needed for maintenance could be recognized by them prior to need.

The following matters were determined to be of sufficient importance to be specifically identified as STRENGTHS and WEAKNESSES in the licensee's support interfaces :

Strengths

(1) Addition of a health physics person to the planning and scheduling of maintenance activities.

Weaknesses

(1) Failing to keep systems engineers adequately informed of problems identified in their systems.

(2) Failing to adequately communicate regarding parts needs.

Conclusions

There was insufficient NRC review of the licensee's documented program for communication between maintenance and support organizations. Therefore, the program was designated as NOT EVALUATED. The NRC team consensus was that while the licensee implementation of support interfaces appeared somewhat weak, it was marginally SATISFACTORY.

7.0 Maintenance Facilities, Equipment and Materials Control

Rating:

Program: POOR

Implementation: POOR

Scope

This area encompasses the plant maintenance facilities, equipment and materials control with regard to the part they play in supporting the maintenance process. For NRC evaluation, this area was divided into four elements which were examined separately.

Maintenance facilities and equipment provided (7.1)

Materials controls (7.2)

Maintenance tool and equipment controls (7.3)

Control and calibration of measuring and test equipment (7.4)

The team consensus was that both program and implementation were inadequate for this area. Although two elements of this area (7.3 and 7.4) were not evaluated, the team felt that the WEAKNESSES identified in control of spare parts were sufficient to justify a POOR rating for this area. The team considers inadequacies in the licensee's control of spare parts to be one of the principle deficiencies in their maintenance program and its implementation.

7.1 Provision of Maintenance Facilities and Equipment

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the maintenance facilities and equipment provided by the licensee. It was inspected to assess the extent to which these facilities and equipment facilitate performance of maintenance.

This area was examined by general inspections within the maintenance shops, tool rooms, training areas, and areas within and outside the RCA with respect to the following attributes.

* Facility arrangement and accessibility..
* Training and Mockup facilities.
* Staging, laydown area, and scaffolding available and in sufficient quantities and space.
* Communications systems availibility.
* ALARA training and mockup facilities area available and adequate to meet the ALARA goals and objectives.

Findings

(a) Maintenance facilities were located as efficiently as possible considering the generally crowded plant layout.

(b) Maintenance supervisors offices were located close to the shops.

(c) Maintenance shops appeared to have most tools required for the work performed.

(d) Parts and tools storage and requisition was well organized and adequately stocked.

(e) Metering and calibration labs were well organized and calibration activities efficiently completed.

(f) Staging and laydown areas were inadequate, especially within the RCA.

(g) Rigging and scaffolding was poorly organized and completed, especially within the RCA.

(h) Training and mockup facilities appeared inadequate with relation to ALARA goals.

(i) The storage of contaminated tools was small and crowded.

STRENGTHS AND WEAKNESSES FOR THIS ELEMENT

Strengths

Findings (b), (d), and (e) were considered significant enough to be termed STRENGTHS.

Weaknesses

Findings (f), through (i) were considered WEAKNESSES

Conclusions

The team noted that within the last two years the licensee had made a number of improvements in facilities, and equipment, e.g., the addition of a new maintenance building and new training facilities. However, some WEAKNESSES remain - for example, with regard to the adequacy of stagging and laydown areas and storage of contaminated tools. Having weighed the STRENGTHS and WEAKNESSES identified, the consensus of the team was that the program and implementation for this element were both SATISFACTORY.

7.2 Establishment of Materials Controls

Rating:

Program: POOR

Implementation: POOR

Scope

This element encompasses the licensee's material controls in their support of the maintenance process. This area was examined by a general inspection of warehouse storage conditions and specific examination of a random sample of stored parts (Code Class Valves and CVCS Hi-Head charging pump parts)together with attendant QC

documentation/computer records for the parts involved. Records associated with maintenance of EQ temperature and humidity requirements (July and August 1988) and training of warehouse personnel were also reviewed. Procedures and other documentation were also reviewed in order to assess the following attributes:

* Policies and procedures had been documented and implemented which provided:

  - Guidelines for ensuring a timely procurement of materials, including long lead time items.

  - Guidelines for identifying required documentation, testing, inspections and traceability of records.

  - Guidelines for identifying required specifications for materials.

  - Guidelines for identifying and expediting emergency procurements.

  - Requirements for identification of acceptable sources including their qualification.

  - Guidelines for identifying the required number of spare parts (each type), the number control, and reorder.

* Guidelines and criteria for identifying materials shelf life.

* Guidelines for spare parts identification.

* Guidelines for identifying acceptable consumable materials.

* Guidelines for receipt inspection and the criteria to be met.

* Storage, considering:

  - Separation of qualified and unqualified materials.

  - Storage of hazardous materials.

  - Protection of stored materials and parts.

* Traceability of documentation

* Issuance - with consideration for requisition identification, work order identification and guidelines and controls for returning if not used per the work order.

Documentation and hardware examined by the team for this element are listed below.

I. Procedures

AP-0910.4	APO-0190.72	0-ADM-500
0-ADM-703	0-ADM-900	

Corporate QA Manual

QP 17.1 The Collection and Storage of QA Records for Nuclear Power Plants, Rev. 14.

QP 4.1 Control of Procurement Originated by Operating Plant Personnel, Rev. 20.

QP 13.1 Handling, Storage and Shipping of Material, Parts and Components, Rev. 6.

QC 4.1 Quality Control Departments Procurement Reviewer's PDRT Instructions, Rev. September 20, 1988

Operation and Backfit Stores QA Manual

QI NO.	TITLE	REV. NO.
QI 1-S-1	Organization	7
QI 2-S-1	Training Program	13
QI 2-S-10	Housekeeping	2
QI 4-S-1	M&S Requisitions & M&S Catalog Control	1
QI 6-S-1	Document Control	11
QI 7-S-1	Receipt Inspection	15
QI 8-S-1	Identification and Control of Purchased Material	3
QI 13-S-1	Handling, Storage & Shipping	13
QI 15-S-1	Control of Non Conforming Material	2
QI 16-S-1	Corrective Action	5

II. Parts - CVCS Hi-Hd Charging Pump

Part Name	Stores Number
Adapter, Primary Female	630-12601-0*
Gasket, Cylinder Head	630-27002-1
Gasket, Disch. Valve CVR	630-27002-1
Gasket Stuffing Box	630-27002-1
O-Ring	630-35701-1
Packing, Secondary	630-36801-3*
Gasket for Seal Dot Sight Glass	764-05061-8
Cap, Machined - for the Suction Stabilized	630-18100-2
Packing, Primary	630-42110-1
Spring, Primary	630-50410-3
Ring, Backup Primary	630-41636-1
Ring Backup Primary, (Back)	630-41630-1
Packing, Secondary	630-42115-1
Ring, Backup Secondary (Front)	630-41635-2
Cylinder, Fluid	630-23001-1
Guide, Suction Valve	630-31401-1
Guide, Discharge Valve	630-31401-1
Valve, Discharge	630-54502-1
Seat, Suction Valve	630-47601-1
Seat Discharge Valve	630-47601-2
Spring, Suction and Discharge Valve	630-50701-3
Spring, Primary	630-50801-0
Spring Secondary	630-50901-6*
Box Stuffing	630-16001-3
Gland, Stuffing Box	630-28301-8
Bushing, Throat	630-17001-9*
Valve, Discharge Stop	630-54601-9
Follower, Gland	630-26001-8
Plunger	630-39101-5
Flange, Stuffing Box	630-25001-2
Stension, Cylinder Head	630-24001-7
Primary Male Adapter (Incorporated with throat bushing)	630-12601-1
Adapter, Secondary Male	630-12701-6*
Adapter, Secondary Female	630-12801-2*
Packing, Primary	630-36701-7

Note: Parts labelled with an asterisk were in stores but are obsolete due to PCM 85-134

III. Parts - ASME 3/4 in. SS Valve 12-UG-TSW

Part Name	Store Number
Kit - Bellows Sub Assy	577-38651-6
Kit - Sub Assy w/ Adapter Stellite Insert	577-38676-1
"O" Ring - Metal	577-38801-2
"O" Ring - Wire	577-38826-8
Packing Set - 3 es	577-38926-4
Pin (2 Req. Per valve)	577-39026-2

IV. Other ASME Code Items

Items	Store Number
3/8 in. 3-way EQ Solenoid Valve	570-65790-5
Pressure Gauge	760-20430-1
Pressure Gauge	760-20910-8
Gauge Glass Washer	764-05061-8

Findings

During the above examinations the team noted a lack of conformance to corporate QA manual procedures QP 13.1 and QP 17.1 relative to daily records of temperature and relative humidity for the Class B (EQ) storage warehouse. The records had been taken but were not traced as QA records. The team informed cognizant licensee personnel that this would be considered another example of failure to control QA records as previously noted for HP technicians qualification records in Section 4.5. (Violation 250, 251/88-32-04).

The team observed evidence of excessive obsolete inventory in the stores warehouse. Cognizant licensee personnel agreed and noted the previous licensee identification of procedural inadequacies regarding accountability/responsibilities for parts ordered to other than standard M&S Stock Numbers (the PC/M or CWPO Nos.). Several examples of in-house obsolete parts were noted for the CVCS Hi-Head Charging pumps.

The team also noted a concern regarding the history of the CVCS Pump Fluid Cylinder (M&S #630-23001-1) as a typical example of programmatic deficiencies and inadequate resource allocation, which are causing excessive delays from issuance of parts to issuance of purchase order for their replacement. Details are as follows:

- On December 14, 1988 computer shows, one cylinder in-house, three minimum required and non on-order. (Computer was in-error since the one in-house was issued for work on 3A charging pump on December 13, 1988).

- Required minimum of 3 was violated on October 7, 1987 (Only two on-hand).

- Stores issued BAR (Buyer Action Request) to PDRT (Procurement Document Review Team) on October 24, 1987.

- BAR lost for some reason until October 5, 1988.

- On October 5, 1988 PDRT sent BAR to JPN (due to question of code issue date for pump).

- On December 14, 1988 JPN had not responded due to low priority ie. this was one more of the over 300 backlog.

- As of December 14, 1988 - No parts on hand, no parts ordered, no indication from stores computer of new violation of minimum.

Cognizant licensee personnel responded that root causes of the above situation had been identified by the QIP Turkey Point/ St. Lucie cross plant team to improve the control and standardization of components and their parts. The team acknowledged that this effort appears incisive and highly self-critical. However, QIP recommendations have generally not been implemented.

The team found inadequate receipt inspection of CVCS Pump Suction discharge valve seats (M&S #630-47601-1). Several of these parts were examined by the inspectors and demonstrated unacceptable cleanliness (surface contamination due to dust, grease, millfilings, etc) in that cleanliness requirements of the receipt inspection procedure, TS 7.1, were not met.

These parts were reinspected by licensee QC personnel in response to the NRC teams concerns. The reinspection results were as follows:

- RIR-R87-7772 (A) = 65 EA. (B) = 8 EA.
  P. O. 87649-90126
  Re-inspection Results
  1 EA. has a grind mark on collar. approx. 1/8" wide 5/8" long and approx. 1/16" deep
  34 EA. have surface contamination i.e. dust, millfilings, grease
  38 EA. clean no apparent surface contamination

- RIR-R86-3842 36 EA.
  P. I. 04926-73253
  Re-inspection Results:
  1 EA. has surface rust, dust, grease
  35 EA. all show signs of surface contamination i.e. dust, grease, mill filings

The inspectors reviewed the original RIRs R87-7772 and R86-3842 and noted that cleanliness was one attribute shown to be inspected and acceptable earlier per licensee procedure TS 7.1 requirements.

The inspectors informed cognizant licensee personnel that this item would be identified as Violation 50-250/251/88-32-03, Failure to Properly Perform Receipt Inspections.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

(1) The licensee's QIP self-assessment appeared to be incisive and highly self-critical of performance in this area.

(2) The licensee has taken some aggressive actions to improve performance, including plans for more than doubling present EQ warehouse storage.

(3) Documentation (with one exception) appeared to clearly establish that materials and equipment conformed to procurement requirements.

(4) Warehouse storage meets Class B (EQ) requirements and is well organized (though crowded).

(5) Parts issuance is efficient and stores personnel appear well trained.

Weaknesses

(1) Excessive obsolete and untraceable inventory due to lack of procedural requirements for a uniform part numbering system.

(2) Inadequate procedural controls to ensure systematic update on repeat violation of minimum inventory requirements.

(3) Inadequate allocation of resources to prevent highly excessive delays from issuance of parts to issuance of purchase orders for their replacement.

(4) Inadequate receipt inspection of ASME component parts.

(5) Inadequate control of QA records relative to maintenance of EQ storage conditions.

<u>Conclusions</u>

The overall inadequacies in parts control described above, represent a major deficiency in the licensee's maintenance. On the basis of

this deficiency, the consensus of the team was that the program and implementation for this element are POOR.

7.3 Establishment of Maintenance Tool and Equipment Control

Rating:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope, Findings, and Conclusions

This element encompasses the maintenance tool and equipment controls established by the licensee.

The element was not inspected in sufficient detail to draw any conclusions. Therefore, it is being rated NOT EVALUATED both for program and implementation.

7.4 Provide Control and Calibration of Metering and Test Equipment

Ratings:

Program: NOT EVALUATED

Implementation: NOT EVALUATED

Scope, Findings, and Conclusions

This element encompasses the licensee's control and calibration of metering and test equipment.

While the team's observation for this element tended to indicate a GOOD program and implementation for this element, it was not inspected in sufficient detail for evaluation. Both program and implementation were, therefore, rated NOT EVALUATED.

8.0 Personnel Control

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This area encompasses the training, staffing control, testing and qualification and current status of maintenance personnel.

The team consensus was that the program for and implementation of personnel control were both SATISFACTORY. This conclusion was reached after consideration of the relative importance of the STRENGTHS and WEAKNESSES identified in each element evaluated.

8.1 Establish Staffing Control

Rating:

Program: SATISFACTORY

Implementation: POOR

Scope

This element encompasses the proceduralization and implementation of personnel control in the maintenance process. Components of personnel control include:

- Hire, fire, and promote polices
- Organization chart
- Personnel disciplinary actions
- Turnover mininization policy
- Shift coverage control
- Job descriptions
- Descriptions of types of craft and their responsibilities
- Number of personnel
- Emergency maintenance control

The element was inspected through interviews with personnel and review of documention.

Findings

The findings for this element are described below under the headings organization, discipline, performance appraisal, employee turnover, overtime and staffing levels. These are followed by a listing of the STRENGTHS and WEAKNESSES.

Organizational:

Turkey Point Nuclear Plant organization charts were readily available from the administrative/personnel office. The charts reviewed were up to date indicating current positions and incumbents.

The supervisor/foreman ratio appeared adequate in the electrical and mechanical departments. The number of supervisors in I&C appeared extremely large. This appeared to be caused by the lack of foremen in I&C, as a result of the labor union contract. Management seemed to utilize some I&C supervisors as they would foremen, although other supervisory duties at times conflicted with the "foreman" role. The I&C supervisors and journeymen interviewed did not consider the lack of foremen a major problem in getting work accomplished. During these interviews a thought was expressed that lack of foremen may limit possible advancement opportunities among the I&C journeyman ranks, but advancement was seen by these employees as possible to the supervisor level and to the operations department.

A review of job descriptions of managerial personnel was made. The job descriptions were up to date and clearly written. Job descriptions were used as a basis document for the incumbent's performance evaluation. Job descriptions for union employees were not available since the union contract contained provisions for defining the work assignments of those in the bargaining unit. A review of the union contract indicated such provisions.

The major accountabilities of the Plant Manager and Maintenance Superintendent were reviewed. These were found in their job description and in their business plan. There was internal consistency between these two documents and the business plans of these two individuals. Major accountabilities of the Plant Manager were: plant reliability and efficiency, compliance with county, state, and federal regulations with the highest emphasis on public safety; cost and expenditure control, and employee development, safety and welfare. In turn, the Maintenance Superintendents major accountabilities utilized those of the Plant Manager as a basis and were as follows: system equipment maintainability, employee turn over rates, outage duration and productivity.

Discipline:

Plant management's emphasis on strict adherence to maintenance procedures had resulted in several disciplinary actions for individuals who had not followed procedures. Disciplinary action was strict. In the view of all employees interviewed such action was conducted in a fair and equitable manner. (Employees concerned apparently were told to follow procedures, were aware of the policy, and were told that disciplinary action would take place for flagrant violations. The employees concerned did violate procedures, were caught, and were disciplined, and none was released.) When questioned, plant management indicated that they had a policy which was widely distributed indicating strict adherence to maintenance procedures was important to improving the maintenance program of the plant. This policy was confirmed by reviewing Turkey Point policy. By disciplining the violators a message would be sent to all employees that management was serious about improving the maintenance of the plant. Management considered this an example of changing the cultural values among employees.

Performance appraisal:

Interviews with a variety of bargaining unit employees indicated that they had not received recent performance appraisals. Several indicated that they had not been formally appraised in years. When asked about this, the manager of the administrative unit indicated that this may have been true in the past but that he had recently spent a considerable amount of effort in encouraging supervisors to rate their employees. The union contract called for periodic performance appraisals for employees at various intervals, four months for new employees or two years thereafter. Non-bargaining unit employees were to be appraised on a yearly basis.

The administrative unit supplied a computer printout of all plant employees indicating when each received their last performance appraisal. The data indicated that non-bargaining unit employees throughout the plant were generally appraised on a yearly basis. Of the 298 non-bargaining unit employees, both exempt and non-exempt, 10% were not appraised within the past 12 months as required. Of note, the data indicated the Maintenance Superintendent had not been appraised in 30 months. Of bargaining unit employees in the maintenance department who were scheduled to receive a performance appraisal every two years, 81% had not received an appraisal within the scheduled time period. Thirty-five percent of the two year bargaining unit employees had not been appraised in the last six years. Of those employees in the bargaining unit entitled to receive an appraisal after four months of employment, 72% had not been appraised. It appeared that management had not adequately concentrated on appraising bargaining unit employees, thus not providing these employees with formal feedback on their performance. Management should be strongly encouraged to conduct performance appraisals for bargaining unit employees in a timely manner and regularly rate all employees in order to provide them the necessary feedback on performance.

Employee turnover:

A review of current employee turnover rates was made from data supplied by the administrative unit. During the past 12 months the total annual turnover rate for FP&L Power Plants was 2.7% (95 employees). The Turkey Point Nuclear plant annual rate was 3.5% (27 employees), considerably higher than FP&L power plants as a whole. The Turkey Point Nuclear plant rate compared favorably with the company total employee turnover rate of 4.2% (633 employees).

According to information supplied by the Maintenance Superintendent, within the past 15 months the mechanical maintenance department had a turnover rate of 16%. Within the past 12 months the electrical maintenance department turnover rate was 13.5%. The I&C turnover rate was 20.4% in 1987 and 10.1% in 1988. It should be noted that traditionally I&C technicians transfered to operational units rather than leave the FP&L system, and that employees in mechanical and electrical as well as I&C transfered to other units within Turkey Point or the FPL system as part of normal career changes.

Turnover figures for previous years were not available at the time of this inspection for use in comparison purposes, but the current data indicated rather high rates with reductions in the I&C area.

Employee Turnover Rates

	Active Employees	Separations 12 Months	Annual Turnover Rate
Turkey Pt.Nuclear	764	27	3.5%
FPL Power Plants	3,522	95	2.7%
FPL Company-wide	15,121	633	4.2%

Overtime:

Turkey Point Nuclear, in response to the IMA Report, had established guidelines and controls to reduce the amount of overtime. For the I&C department bargaining unit employee overtime for 1987 was 51.27% while in 1988 the overtime rate was decreased to 29.8%. This reduction apparently was a result of an increase of I&C staff from 37 to 47 employees. Further analysis of overtime rates is not possible at this time because no data regarding current overtime expenditures for the electrical and mechanical departments was available during the time of this inspection. The data that had been supplied did indicate, as in the IMA Report, that overtime was excessive and may be a contributing factor in the quality of maintenance activities.

Interviews with bargaining unit employees and non-bargaining unit supervisory level employees indicated that overtime was excessive with employees working ten-hour days including Saturday work. The Maintenance Superintendent indicated that he was making a concerted effort to reduce overtime. Overtime rates in the maintenance department appeared to be high and may be a negative factor in the quality of maintenance activities. Management should be encouraged to make a concerted effort to reduce overtime during the next 12 months.

Staffing levels:

A review of the TPN staffing levels was made from data supplied by the administrative unit. Budgeted and actual staffing levels were on target except for the I&C and Health Physics departments. The I&C budgeted level is 80 while the actual employment level is 91. This indicated an effort by management to reduce overtime in I&C and work backlogs. The Health Physics department budgeted for 89 employees but actual staffing level is 49. TPN utilized contracted workers to a great extent, not only in the maintenance area but in other areas (e.g., system engineers). The correct ratio between contract workers and FP&L workers had not been established, but the team considered over-use of contracted workers diminished managements efforts to improve the cultural values at TPN. The team was concerned that contract workers do not have the same sense of "ownership" to improving the maintenance operations of the plant that full time TPN employees would have. The Plant Manager indicated he was concerned with the large number of contract workers and planned in the future to reduce such numbers.

TPN Staffing Levels as of 12/27/88

	Actual	Budgeted
Mechanical	181	179
I&C	91	80
Electrical	60	59
Health Physics	49	89
Reactor Engineering	10	12
Chem/RadioChem	22	20
Operation	150	141
Management Info.	14	13
Security	8	8
Budget	5	5
Personnel/Adm.	15	15
QC	16	18
Training	54	58

Fire Protection	3	5
Document Control	12	8
Safety Eval.	4	5
Backfit/startup	12	12
Technical	51	62
Reliability	12	17
Plant Management	19	7

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The team did not identify any aspects of the personnel staffing control program that were clearly superior to average industry-wide performance.

Weaknesses

(1) The team found that management has not adequately concentrated on providing formal, regular appraisals of employees; thus loosing some of the benefits in improved performance and worker satisfaction that can be gained through formal performance appraisals.

(2) A relatively high turnover rate in the maintenance areas may have had a negative effect on overall performance.

(3) Overtime rates were excessive and may be a contributing factor in the quality of maintenance activities.

(4) Use of contract personnel appears excessive.

Conclusions

The first three weaknesses mentioned above may all be interrelated. The team believed that the situation with performance appraisals could be easily rectified. Overtime rates would be reduced by increasing staff and through increased efficiency. Correction of these problems may help reduce the turnover rate, but this problem may be difficult to eliminate. Excessive use of contract personnel may also be readily corrected though lack of availability of properly qualified personnel may delay the effort. Due to these weaknesses, the licensee's efforts in the area of staffing control were POOR. Documentation was SATISFACTORY.

8.2 Provide Personnel Training

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses training for plant and contractor personnel. The rating associated with this section is an evaluation by the maintenance team inspection members of the extent to which training is implemented and documented in the maintenance process. Facts relevant to the evaluation of this element were obtained in a discussion between the NRC inspector and the Maintenance/Specialization Training Program Supervisor, a follow-up discussion with the Maintenance Training Coordinator and observation by all the NRC team members.

The discussion with the Maintenance/Specialized Training Program Supervisor covered the history of the training program at Turkey Point, and it provided an overview of the program. The session also included a tour of the training center.

Findings

In January 1986, FP&L inaugurated a training program modeled from the INPO guidelines. Since then the program has received INPO accredition in the areas of electrical, mechanical and I&C maintenance as well as other areas. In 1986 they utilized the training facilities at the Cutler Plant, a nearby fossil plant owned by FP&L. In January 1987 a new 65,000 square foot space, two story, training building was completed, and that became the training center for Turkey Point personnel. For the first 18 months of the INPO program, journeymen attended classroom courses from the initial phase of the basic program. July 1, 1987 was an important date in the licensee's program, because after that date each Journeyman had to be rated qualified under the INPO program in order to work independently. Actually journeymen were rated in each of about 20 areas related to their discipline. Successful completion of the initial phase would result in full qualification. Since none of the journeymen had completed even a majority of the basic initial phase of training by July 1, 1987, a problem of qualification of journeymen arose. The problem was avoided by a process of "grandfathering" whereby a panel of supervisors issued ratings of qualified in specified areas according to criteria agreed upon by the Training and Maintenance Departments.

For a new employee (hired after July 1, 1987), the initial basic phase is mandatory and consists of a two-week introductory course, discipline courses and on-the-job training. The introductory course covered regulatory requirements, hazardous materials and like topics for the first week and plant systems for the second week. The discipline courses varied in duration as summarized in the table below.

BASIC INITIAL PHASE - JOURNEYMAN

DISCIPLINE	NUMBER OF WEEKS	
	CLASSROOM	ON-THE JOB
Electrical	9	3
I & C	14	3
Mechanical	10	3

The on-the-job training may be given by an instructor from the training department or a designated journeyman. Technical staff, such as GEMS personnel and field supervisors, would receive six weeks of initial training in systems, regulations and organization. Limited use of self-study modules were incorporated in the program. A typical self-study module is No. 1501018, "Operate Direct Current High Potential Tester", which, as the title implies, covers a particular task.

One instructor taught exclusively courses for quality control inspectors. He used a curriculum built around INPO guidelines, which at the time of inspection had not received formal accreditation. Journeymen who work for a contractor received site specific training by FP&L and specific-task training usually given by an outside company.

In addition to the initial basic training, the program provided for continuing education. The goal is that each FP&L journeyman would receive four weeks of training annually to include refresher courses, industry events topics, systems training and specialty training. An example of specialty training given in the past was an MOV maintenance course given by an outside company.

During an interview, one of the quality control inspectors for surveillance and maintenance work described the training he received in 1988 to the NRC inspector. He had attended an in-house two-week course on visual examination and passed a EPRI administered test for proficiency levels I and II on that subject. He had also attended digital thickness, security and EPRI EQ training. The quality control inspector stated that he typically receives two to three weeks of training per year. Individual journeymen confirmed that they typically receive about three weeks of training in their disciplines per year. The NRC inspection team members did not

identify or have brought to their attention any cases where re-work was required due to lack of training of the journeymen.

The Training Department Organizational Chart showed positions for three instructors in each of the disciplines, mechanical, electrical and I&C. However, one position in the mechanical and electrical discipline was vacant at the time of the inspection. The two mechanical instructors had each worked at Turkey Point Nuclear for about seven and one-half years in the Maintenance Department. The two electrical instructors had considerable years of experience in their fields and as instructors. Each of the I&C instructors had twenty years of military experience, two in the Navy's Reactor Controls Division and one in the Air Force. Two of the I&C men had considerable experience as instructors. The Maintenance Training Coordinator had about twenty years experience at Turkey Point in the mechanical area. Typical training for instructors is as follows:

- Public speaking - 3 days
- Writing skills - 5 days
- Course development - 5 days
- Outside technical course - one week per two year period
- Systematic approach to training - 5 weeks

Except for certain specialty training discussed in section 8.4, the NRC inspection team did not identify any specific recommendations for improvement of Turkey Point's training program to support maintenance. The licensee had already recognized that the systems engineers in the operations support group did not have sufficient training in the area of systems design and operation to fulfill the role of "systems engineers" as envisioned by the new policy stressing the concept of system engineering. Therefore, the licensee was in the process of developing a 12 - week systems course. Implementation of the overall training program was flawed due to extensive reliance on "grandfathering". The team did not delve into the quality of the training program as it existed before start of the "INPO" program.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strengths

The team did not identify any aspects of the training program that were clearly superior to industry wide performance.

Weaknesses

(a) Extensive use of "grandfathering"
(b) Lack of solid systems design and operation courses

Conclusions

The team's assessment of the licensee's program and its implementation is one of adequate. Indications were that a commitment had been made by management to provide quality training, and, in time, the program will probably improve. Both program and implementation were now considered to be SATISFACTORY.

8.3 Establish Test and Qualifications Process

Rating:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the integration of personnel testing and qualification into the maintenance process.

The rating associated with this section was an evaluation by the maintenance team inspection members of the extent to which the training program incorporated objective testing of maintenance personnel. Easy retrievability and traceability of training and test records was considered a hallmark of a good program.

Findings

During a discussion with the Maintenance Training Coordinator, the NRC inspector requested to review the files on a particular journeyman picked at random. The Coordinator and his administrative assistant quickly retrieved the requested documents from a central file. The central file consisted of recently issued original documents and microfilms of older documents. An actual graded exam taken in 1986 was seen by the inspector on a microfilm viewer to support the worker's rating of qualified for a particular task. This exercise demonstrated that records of formal instruction were retrievable from a central file. In discussions with the Assistant Superintendant of Electrical Maintenance and Field Supervisors, the NRC inspector saw that the managers had summary sheets which indicated the qualifications of all the workers in each area. These summary sheets facilitated assigning workers to particular jobs. One of the NRC inspectors reviewed selected training records for quality control inspectors involved in material receipt inspections. These records were found to be in order. Training and qualification records for health physics personnel were not always properly maintained; refer to Section 4.5 for details.

SIGNIFICANT STRENGTHS AND WEAKNESSES WERE NOT IDENTIFIED FOR THIS ELEMENT

Conclusion

The NRC team's judgment was that the program and implementation of training tests and qualification was SATISFACTORY.

8.4 Assess Current Status

Ratings:

Program: SATISFACTORY

Implementation: SATISFACTORY

Scope

This element encompasses the status of maintenance personnel in relation to testing and qualification, drug problems, work performance by unqualified personnel and turnover rate.

Findings

There were approximately forty-three electrical journeymen working at TPN during the dual unit outage (not counting contract personnel). This was determined through interviews with field supervisors. About four men were on loan from the St. Lucie Plant, and one is permanently assigned to the tool room. Eleven of the forty-three were not considered qualified in many areas because they were relatively recent hires and had not completed training. Five of the eleven new hires represented new positions and six were due to turnover. In general, new men worked on mid-shift or back-shift. This situation resulted in the mid-shift and back-shift being staffed almost entirely by technically unqualified workers. Obviously, this has an impact on the progress of work. Therefore, turnover rate, at least, among electricians, was considered a problem by the team. The Maintenance/Specialized Training Program Supervisor stated that relatively high turnover rates among journeymen was a fact of life at TPN. This had its impact on training because resources had to be devoted to providing the basic initial phase of courses for new employees.

One team member identified that lack of re-training of health physics personnel hired on a contract basis was a problem; refer to 4.5 for details. In section 6.1.3, "Instrument and Control Maintenance", a problem regarding the qualification records for individuals transferred from the FP&L St. Lucie site was discussed. Section 5.2, "Establish Work Order Control" discusses that planning personnel and systems engineers may need additional training in the use of the computerized work order control system in order to maximize the usefullness of that system.

While the Turkey Point Plant does have a random drug testing program, this program or any possible drug related problems were not inspected during this inspection.

The training center at Turkey Point certainly provides the necessary facilities in terms of equipment, models, training aids, workshop and classroom space etc. to support a good training program.

STRENGTHS AND WEAKNESSES IDENTIFIED FOR THIS ELEMENT

Strength

Training Building

Weaknesses

(1) High turnover rate

(2) Lack of or inadequate training in certain areas.

Conclusions

The team, taking into account the STRENGTH and WEAKNESSES identified above, concluded that both the licensee's program and its implementation were SATISFACTORY.

C. CONCLUSIONS

As previously discussed in A.4 above, the evaluation of maintenance described herein utilized the maintenance inspection tree depicted in Appendix 6. The tree divides the maintenance evaluation into three parts (I, II, and III) which are, in turn, subdivided into a total of eight elements.

Part I is entitled, "Overall Plant Performance Relative to Maintenance" and is composed of evaluations of the direct measures of plant performance provided by historic data and plant walkdown observation data. The NRC maintenance inspection team determined that these direct measures indicated POOR maintenance.

Part II is entitled, "Management Support of Maintenance" and consists of those organizations and actions which management uses to support maintenance. The team concluded that management's program in this regard was SATISFACTORY but that implementation was POOR. The team was strongly influenced in rating implementation POOR by evidence of inadequate past allocation of resources to maintenance and apparently insufficient engineering support (particularly with regard to use of systems engineers).

Part III is entitled, "Maintenance Implementation" which represents the controls that are applied to maintenance activites, personnel and hardware to assure proper performance of maintenance. The team again concluded that the program was SATISFACTORY but implementation was POOR. The POOR rating stemmed principally from evaluations which found weaknesses in implementaion of work controls and material controls (especially spare parts).

The team's overall conclusion was that the program for maintenance at Turkey Point was SATISFACTORY but its implementation was POOR. In many areas, new programs and increased management attention were noted which appeared to be improving the maintenance process and its implementation. The team was optimistic that this improvement would continue.

D. EXIT INTERVIEW

The inspection scope and results were summarized on January 12, 1989, with those persons indicated in Appendix 1. The inspectors described the areas inspected and discussed the results that are described above and shown in the Maintenance Inspection Tree in Appendix 6. Four violations and one Inspector Followup Item were described to the licensee. In a subsequent telephone conversation on March 21, 1989, the licensee was informed of several changes to the evaluations of several elements from those described in the exit meeting. These changes did not effect the overall conclusion described in the exit meeting. The licensee was informed of an additional Inspector Followup Item and of another example of one of the Violations that had been identified. The Violations and Inspector Followup Items identified as a result of the inspection are listed below.

Violation 250,251/88-32-01, Failure to Take Prompt Corrective Action with Regard to Equipment Identification Tagging, paragraph 1.2.

Violation 250,251/88-32-02, Procedural Related Deficiencies, paragraph 4.5, 5.2, 5.8 and 6.3.

Violation 250,251/88-32-03, Failure to Properly Perform Receipt Inspections, paragraph 7.2.

Violation 250,251/88-32-04, QA Records Not Properly Stored, pargraphs 4.5 and 7.2.

Inspector Followup Item 250,251/88-32-05, Controls/Accountability for Entry into Radiologically Controlled Areas, paragraph 4.5.

Inspector Followup Item 250,251/88-32-06, Root Cause Evaluations in Radiological Incident Reports, paragraph 4.5.

Appendices

APPENDIX 1

PERSONS CONTACTED

Notes: (1) Persons who attended the exit meeting are indicated with an asterisk (*)
(2) Individuals specifically interviewed relative to material in a report subsection have the subsections listed beside their titles in parenthesis ( )

NAMES AND TITLES

*R. Acosta, Director, QA
*J. Anderson, Supervisor, QA Regulatory Compliance
*J. Arias, Supervisor, Regulatory Compliance
*D. Chaney, Director, Nuclear Licensing
*W. Conway, Senior, Senior Vice President, Florida Power and Light Company (FP&L)
*J. Cross, Plant Manager
*J. Gianfrancesco, Assistant Maintenance Superintendent
*S. Hale, Engineering Project Manager
*J. Hasmen, Director, Nuclear Energy
*J. Hays, Manager, Nuclear Energy Services
*J. Kappes, Maintenance Superintendent
*J. Newman, Regulatory Compliance
*J. Odom, Site Vice President
*L. Pearce, Operations Superintendent
*C. Pell, Assistant to Senior Vice President - Nuclear
*D. Sager, Acting Vice President - Nuclear Energy
*F. Southworth, Technical Supervisor
*R. Stevens, Manager, Plant Licensing
*J. Velotta, Manager - Planning and Control, Nuclear Energy Department
J. Donis, Operations Support Supervisor, Systems Engineering
R. DeLaEspriella, Systems Reliability Project Engineer
W. Raaseh, Balance of Plant Lead Engineer
G. Max, System Engineer, Instrument Air System
M. Carman, System Engineer, Component Cooling Water
P. Fatka, System Engineer, Chemical Volume Control System
K. Greeves, System Engineer, Intake Cooling Water
H. McKaig, System Engineer, Reactor Coolant System
S. Schaeffer, System Engineer, RHR Safety Injection
T. Gillmore, System Engineer, Emergency Diesel Generator
P. Zocco, Mechanical Maintenance Engineer
H. Young, Site Project Manager
J. Strong, Assistant Superintendant, Mechanical Maintenance
R. Lee, Inspection Supervisor
R. Hawkes, Planning Supervisor, Mechanical Maintenance
S. Franzone, Lead Licensing Engineer
M. Molroq, Lead Mechanical Engineer
L. Thompson, Mechanical Engineer

M. Wayland,. Assistant Superintendent Electrical Maintenance
D. Boyle, Production Supervisor Electrical Maintenance
G. Heisterman, Support Supervisor Electrical Maintenance
R. Bumgarner, Safety Supervisor
C. Kelly, Maintenance/Specialized Training Program Supervisor
M. Powell Maintenance Training Coordinator
R. Love, Field Supervisor Electrical Maintenance
A. Janelle, Stores Supervisor
G. Regal, Technical Supervisor Corporate Maintenance
J. Mosesso, Technician Regulatory Compliance
M. Aside, Operating Experience Feedback Engineer
T. Dillard, Manager of Nuclear Maintenance Corporate
A. Martinez, Elec/I&C Supervisor Operations Support Group
E. Carrasquillo, Plant Electrician
D. Manka, Chief Electrician
B. Young, Plant Electrician [Acting Chief]
M. Goostree, Field Supervisor Electricial Maintenance
E. Guerra, Maintenance/Surveillance Inspector Quality Control Department
T. Coleman, ALARA Supervisor
P. Hughes, Health Physics Supervisor
R. Brown, Operations Supervisor, Health Physics
J. Bates, Assistant Supervisor, Health Physics
J. Williams, Plant Technician, Dosimetry Supervisor
J. Webb, Planning Supervisor, Health Physics
G. Riveron, Planning Supervisor, Instrumentation and Controls, I&C
R. Longtemps, Outage Manager, Operations
M. Powell, Maintenance Training Coordinator
J. Danek, Health Physicist, Corporate
R. Seay, I&C Planning Supervisor
J. Harley, I&C Supervisor
A. Ray, Plant Work Order Coordinator and Trainer
S. West, Acting Electrical Maintenance Planning Supervisor
L. Bladous, QA Superintendent
R. Earl, QC Supervisor
W. Williams, Assistant Superintendent, Planned Maintenance
J. Webb, Outage Planning Manager
J. Mogarero, Electrical Planning Group Data Entry Technician
M. Smith, I&C Planning Group Data Entry Technician
V. Wagner, Procedure Upgrade Program Supervisor
K. York, QA Records Supervisor
G. Rhodes, QA Records Technician
J. Ferrare, PDRT
B. Sharp, Administration
E. Wertz, Administration
T. Finn, Training Manager
T. Dillard, Maintenance Staff, Corporate Office
G. Regal, Maintenance Staff, Corporate Office
T. McNamara, Mechanical Field Supervisor
M. Willis, I&C Journeyman

L. Capera, I&C Journeyman
R. Garcia, Electrical Journeyman
G. Smith, Services Manager, Administrative Office
L. Sayers, Administrative Office
L. McCullough, Administrative Office
R. Sontag, INPO Coordinator
H. Schneider, Predictive Maintenance Coordinator

APPENDIX 2

ACRONYMS AND INITIALISMS

AEOD	-	NRC Office for Analysis and Evaluation of Operational Data
CCW	-	Component Cooling Water
CE	-	Combustion Engineering
CVCS	-	Chemical Volume Control System
EDG	-	Emergency Diesel Generator
EPRI	-	Electrical Power Research Institute
EQ	-	Equipment Qualification
FP&L	-	Florida Power and Light Company
GL	-	NRC Generic Letter
HX	-	Heat Exchanger
IAS	-	Instument Air System
ICW	-	Intake Cooling Water
IMA	-	Independent Management Appraisal
IN	-	NRC Information Notice
INPO	-	Institute for Nuclear Power Operations
I&C	-	Instumentation and Controls
JPE	-	Juno Project Engineering
LCO	-	Limiting Condition of Operation
LER	-	Licensee Event Report
MART	-	Maintenance Assistance and Review Team
MTBF	-	Mean Time Between Failures
MWE	-	Megawatts Electric
NCR	-	Nonconformance Report
NJPS	-	Nuclear Job Planning System
NPRDS	-	Nuclear Plant Reliability Data System
NSSS	-	Nuclear Steam Supply System
NUMARC	-	Nuclear Utility Management and Resources Council
OTSC	-	On the Spot Change
PDRT	-	Procurement Document Review Team
POD	-	Plan of the Day
PRA	-	Probabilistic Risk Assessment
PUP	-	Procedure Upgrade Program
PWO	-	Plant Work Order
RCA	-	Radiologically Controlled Area
RCS	-	Reactor Coolant System
RHR	-	Residual Heat Removal
SALP	-	Systematic Assessment of Licensee Performance
SI	-	Safety Injection
TI	-	NRC Temporary Instruction
TPN	-	Turkey Point Nuclear Plant
VP	-	Vice President

APPENDIX 3

RADIOLOGICALLY CONTROLLED AREA AND CONTAINMENT ENTRY DATA FROM SUPERVISORY AND ENGINEERING PERSONNEL

RECORDS OF THOSE MANAGERS REQUIRED TO TOUR 2 HOURS DAILY SINCE 10-13-88
RECORDS WERE REVIEWED FROM 10-1 THRU 12-12-88

NAME	DEPARTMENT/TITLE	ENTRIES
R. J. Earl	QC/QC Supervisor	02
T. A. Finn	TRNG/TRNG Supervisor	00
L. W. Pearce	OPS/OPS Superintendent	00
F. H. Southworth	TECH/TECH Supervisor	00
J. A. Labarraque	MGMT/Senior Technical Advisor	00
J. E. Cross	MGMT/Plant Manager	01
J. S. Odom	MGMT/Site Vice-President	00
J. D. Webb	OPS/Outage Manager	01

RECORDS WERE REVIEWED FOR CONTAINMENT ENTRIES FROM 6-1 THRU 12-1-88

NAME	DEPARTMENT/TITLE	ENTRIES
J. W. Kappes	MAINT/Maint. Superintendent	10
G. Max	TECH/System Engineer	01
H. L. McKaig	TECH/System Engineer	06
K. Lyle	TECH/System Engineer	00
D. D'Vorek	TECH/System Engineer	00
K. L. Greaves	TECH/System Engineer	00
W. E. Raasch	TECH/System Engineer	00
R. J. Gianfrancesco	MAINT/Asst. Maint. Superint.	06
J. C. Strong	MAINT/Asst. Superint. Mech.	05
J. D. Kenney	MAINT/Production Supervisor	13
R. A. Hawkes	MAINT/Planning Supervisor	17
M. B. Wayland	MAINT/Asst. Superint. Elec.	00
D. B. Boyle	MAINT/Production Supervisor	06
L. J. Bossinger	MAINT/Planning Supervisor	01
D. J. Tomaszewski	MAINT/I&C Supervisor	01
G. F. Harley	MAINT/Production Supervisor	00
J. L. Riveron	MAINT/Planning Supervisor	00
W. R. Williams	MAINT/Asst. Superint. PM	00
R. E. Garrett	MAINT/Support/Special Projects	00
H. L. Schneider	MAINT/Predictive Maint. Coord.	00
R. D. Bumgarner	MAINT/Safety Supervisor	03
J. Freyer	MAINT/Mechanical Engineer	07
J. Halvorsen	I&C/Digital Field Supervisor	00
A. J. Kasmir	MAINT/Support/Welding	00
J. Kovarik	I&C/Engineer	07
V. Miller	I&C/Field Peak Supervisor	07

E.	Saumell	I&C/Planner	03
R. F.	Seay	I&C/Planning Supervisor	00
B.	Simms	I&C/Planner	03
L.	Thompson	I&C/Maint/Mech Engineer	14
M.	Willis	I&C/Day Supervisor	13
F.	Mohamed	MAINT/Mech. Engineer	00
D.	Zocco	MAINT/Mech. Engineer	03
D. F.	Manka	ELEC/Field Supervisor	16
B.	Young	Elect/Plant Electrican (Acting Chief)	09
D. E.	Caruana	ELECT/Special Crew-Chief Electrician	06
M. W.	Goostree	ELECT/Field Supervisor	02
C.	Coles	I&C/Day Field Supervisory	02

APPENDIX 4

HOUSEKEEPING AND EQUIPMENT CONDITIONS OBSERVED IN NRC PLANT WALKDOWNS

The inspectors' observations from their walkdowns are described individually below.

(1) Immediately evident within the plant area is the excessive use of temporary modifications. Temporary Instrument Air System air compressors and associated hoses, and temporary electrical wiring along with the presence of contractual hardware were seen located in the general areas of the plant.

(2) In several of the plant areas, material was left scattered or haphazardly stored, giving the plant a cluttered appearance. Rigging, hoses, pallets, ladders, electrical wire/extension cords, radiological supplies/equipment and bagged waste were evident throughout the Radiological Controlled Area (RCA). Many areas outside the RCA were found to have excessive amounts of trash in inappropriate locations, i.e. the Auxiliary Feed Pump area had numerous types of soft drink cans as well as other miscellaneous debris on top and around the fenced enclosure.

(3) The Weld Shop inside the RCA is posted a "DESIGNATED WELDING AREA" with handwritten signs stating "no open flames" on one of three doors. Within the shop were welding machines, grinding machines and gas bottles of acetylene. Together in a pile were contaminated, five gallon cans of used mineral spirits, MOVATS grease tagged as radioactive material, boxes of paper, grease rags and protective plastic shoe covers, and other radioactive material in contact with cans of volatiles. Additionally, electrical extension cords and welding leads were haphazardly coiled, partially running through the pile of mixed volatiles and combustible materials.

(4) Tours of the containments revealed other examples of weaknesses in the effectiveness of the licensee's exposure control program. The indication possibly contributing to the site's high personnel radiation exposure was the excessive amount of graffitti noted mostly in HIGH RADIATION AREAS inside the biological shield wall on both units, but also in general throughout the containment and in the radiation areas of the auxilliary building.

(5) Also noticeable was a significant amount of corrosion on the ventilation ducts and conduits, and evidence where boric acid had been on floors and walls of the containment.

(6) Evidence of apparently poor work practices were observed. For example, ICW pump 3B shaft was galled, apparently due to direct use of pipe wrenches. Also, flange bolts were seen that appeared to have insufficient thread engagement, (SI test line 3-940M).

(7) Spring can pipe hangars were observed to be fully compressed on the RCP-3-307 seal bypass valve on the excess letdown line, and on the Unit 3 containment spray pump B discharge line. This is undesirable as it indicates unplanned stresses on the lines.

(8) Throughout the plant, motors were noted to have been greased, however, the grease drains were not removed causing the grease to ooze out the seals, resulting in the grease being thrown on to the ventilation screens, collecting dust and clogging the ventilation in the case horizontal motors. In the case of vertical motors, such as motor on some operated valves (MOVs), the grease would ooze on to the shafts of the valve and on/into the packings of the valve (e.g., at the Unit 3 Feedwater Pump Isolation Valves).

(9) Other deficiencies noted by the inspectors that were brought to the attention of the licensee were as follows:

- Temporary modifications/jury-rigs on Unit 3 containment door access.
- Jury-rig packing gland on valve 3-304 RCP Seal Leak Off also noted to be leaking without system pressure. Another jury-rig similar was noted on FIO-3-155.
- Numerous pipe supports on the Auxiliary Feed Pump suction line from the Condensate water storage tank were mis-aligned.
- Clevis pins on pipe supports in the AFW Pump room were replaced with a nail punch in one instance and a threaded bolt in another.
- Lagging was missing from numerous locations. In one case other material was used in place of the lagging and appeared burnt.
- Valve packing leaks were noted in several locations without system pressure. A list was provided to the licensee.
- A modification to PCV-3-455A Pressurizer Spray valve, performed on October 21, 1988 left wires protruding from the actuator, hanging from the overhead, and bundled on an electrical panel inside of containment.

(10) The licensee's tagout system was observed for adequate implementation with only minor inadequacies noted. The tagout system is significantly hampered by the safety requirement to have all persons working the job sign the tagout authorization sheet. This at times may be as high as 12-16 people to sign before work can progress. Seemingly, a very inefficient process which often results in that individual signing for a number of people who may or may not get notified of the status of the isolation.

(11) In a walkdown of the Unit 3 containment, which was reportedly ready for startup, the following adverse conditions were noted:

- unlubricated valve stems with clumps of boric acid ajacent to the stems (e.g., on Unit 3 RHR valve 750)
- unremoved 2X4 lumber piece

- screwdriver left in cable tray
- large foot locker (apparently for tool storage) had numerous large (approximately six inch square) flakes of paint coming off
- RHR cold leg suction isolation valves with discrepant identification
  * Valve ink marked 750, but identification tagged 751
  * Valve ink marked 751 with no identification tag
    (ink-marked numbers were correct, however, the acceptable method for identification is by tagging.)

The licensee has known of their equipment identification tagging deficiencies for several years and has a program in place to obtain correction. Incorrect or missing identification can and has lead to serious operating and maintenance errors. Examples of such errors recently experienced include:

- an instance of incorrect work order cancellation resulting from a missing tag
- a significant event (reactor coolant leakage in excess of 50 gpm on January 7, 1989) that resulted when an unlabeled RHR pump discharge line was opened in error.

Licensee management agreed that labeling deficiences should have been corrected more promptly. The licensee was informed that their lack of prompt action in correcting equipment identification or labeling deficiencies would be identified as NRC Violation 250,251/88-32-01, Failure to Take Prompt Corrective Action with Regard to Equipment Identification Tagging.

(12) Discussions with craft and reviews of plant RCA and containment entry data indicated supervisory and system engineering personnel were not conducting adequate walkdowns to assess plant conditions.

(13) The licensee recognized many of the above deficiences and had established an example of what else was expected for an acceptable standard for maintenance work practices, cleanliness and housekeeping. The Safety Injection Pump rooms were inspected and determined to be good examples of improved standards. The Unit 3 component cooling room is also clean and neat, with few leaks and components that appear to be well maintained. The licensee further attributes some of the above inadequacies to the amount of work in progress due to the on going outage.

(14) Leakage was observed for the following:

-All six drain valves at the Unit 3 Component Cooling Water (CCW), heat exchanger. Interviews revealed that three of the six required maintenance to improve operability.
-General water leakage at the 3A and 3B LP Feedwater heaters
-SI accumulator level transmitter isolation valve and 3-881 (LT 922) root valve both leak.

(15) Pipe support severely misaligned on Condensate Storage Tank supply line to Auxiliary Feedwater Pumps.

(16) Emergency light fixture (EM-43) above Motor Control Center (MCC)3AB11 was improperly supported.

(17) At Unit 4 auxiliary transformer control cabinet, one 3/C control cable was observed to be unterminated and untaped.

(18) Load center transformers 4A and 4B have undesireable PCB insulation.

(19) At the Unit 3 steam generator feed pump room, a section of pipe isulation was left in a cable tray, a worker ventilation orifice was left tied to a cable tray, a 2 1/2 inch pipe was supported via a cable tray support (3BAT50)

(20) At the CCW pumps an open hole was observed in the top of pull box PB-4036.

(21) Excessive gobs of grease up to about an inch in diamenter were observed on valve structures such as Unit 3 RHR values 750 (cold leg suction isolation valve) and 861B (sump suction recirculation valve).

(22) Pressure Indicator (PI) 1545, local readout for Emergency Containment Cooler CCW Outlet Pressure was "pegged" high, reading over 100 psig. Subsequent discussions with licensee planning personnel and observations of licensee PWO database entries revealed that a licensee individual had previously identified the erroneous reading indicator and a PWO had been initiated. However, planning personnel had "coded out" (cancelled) the PWO when their own check failed to reveal the discrepancy. Contrary to the controlling procedure, ADM 701, they did not obtain agreement from the individual who identified the discrepancy when they cancelled the PWO. In later discussion, the NRC inspector was informed that the error had apparently occurred because the planning individual who checked for the discrepant indicator had apparently checked a different indicator whose identification tag was missing.

APPENDIX 5

DOCUMENTS REVIEWED

- Documents Reviewed Relative to Management in Elements 2.2, 3.2, 3.3, 3.7, 4.1, 8.1

Administrative and Maintenance Procedures/Policies Date of Approval

ADM031	-	Independent Verification Policy 8/31/88
ADM019	-	Management on Shift Policy 1/7/88
ADM501	-	Duties & Responsibilities of Systems Engineers 1/15/88
ADM706	-	Predictive Maintenance Program 4/26/88
ADM705	-	Guidelines for the Analytical Based Preventive Maintenance Program 8/2/88
ADM701	-	Plant Work Order Preparation 10/26/88
ADM714	-	Conduct of Maintenance Training 1/26/88
ADM715	-	Maintenance Procedure Usage 10/21/88
MI700	-	Conduct of Maintenance 11/7/88
ADM210	-	DRAFT Plant Work Coordination 11/3/88

Other documents reviewed:

1. Union Contract
2. FPL Quality Improvement Program: The QI Story and Techniques Copyright 1987 by FPL Company.
3. FPLTPN Adminstrative Guide AG 024: Systems Engineer Training Program
4. FPL/TPN Quality in Daily Work Student Handout Notebook #1910105
5. Supervising Tema Teacher Guide Notebook (For QIP Teams)
6. Memo: Management Presence in the Plant and Attendance at Meetings dated October 13, 1988, issued by J. E. Cross
7. Memo: Overtime Policy dated December 4, 1988, issued by G. M. Smith
8. Memo: Overtime Tracking dated December 16, 1988, issued by G. M. Smith
9. Employee Turnover Report Third Quarter 1988
10. Training Department Organizational Chart dated October 14, 1988
11. Memo: System Engineering Improvement Program dated September 30, 1988, issued by J. M. Donis
12. Memo: Calculation of Overtime, dated December 15, 1988, issued by G. M. Smith

13. Memo: Overtime dated July 25, 1988, issued by G. M. Smith

14. Report: Non-Bargaining Unit Employees Last Performance Appraisal, date report executed 12/21/88

15. Report: Bargaining Unit Employees Last Performance Appraisal, date report executed 12/5/88

16. Report: TPN Current Staffing Report Listing issued 12/27/88

17. Report: Handwritten Note from Maintenance Superintendent, Overtime Rates, dated 12/27/88

18. Report: Nuclear Energy Department Policy: Plant Accountabilities, no date

19. Memo: Incumbent Evaluations, dated August 23, 1988, issued by J. A. Labarraque (listing of position descriptions of managers in plant)

20. Report: Maintenance Department Business Plan, dated 11/7/88, issued by J. W. Kappes (business plans and accountabilities of Kappes)

21. Report: Plant Manager Business Plan, dated 11/88, issued by J. Cross (business plan and accountabilities of Cross) issued via memo dated 11/21/88, Business Plans/QIDW

22. Report: TPN Plan of the Day, dated 11/29/88, 6:00 a.m. meeting

23. Report: 1988 Integrated Planning and Control Summary: Operations and Maintenance Expense, issued 11/29/88 for 1988 and 1989

24. Administrative Procedure: Transfer of Knowledge of FPL Nuclear Sites, dated 6/14/88, issued by VP Nuclear and Senior VP Nuclear

25. Report: TPN Organization Charts, dated 9/21/88

26. Report: TPN Nuclear Services Department Priority Issues Reports, dated October 1988

27. Newsletter: To the Point Vol. 1 #39 Novmeber 25, 1988, and Vol 1 #40 December 2, 1988

28. Newsletter: The Nuclear Newsletter, Vol. 1 #10 November 1988

29. Reports: Quality Improvement Story: Main Turbine Control Oil System, no date.

30. Report: Quality Improvement Program Man Rem Reduction Team Report, no date

31. Report: Quality Improvement Program Report Improve Nuclear Instrumentation System Reliability, 7/7/87

32. Memo: QIDW Guidelines, dated March 8, 1988, issued by W. Kent Sterett

33. Memo: QI Team Policy, dated July 8, 1988, issued by W. K. Sterett

34. Memo: Policy for obtaining feedback from management on QI process action plans and countermeasures, dated July 29, 1988, issued by J. E. Cross

35. Resumes of J. Kappes, J. Giafrancesco, D. Tomaszewski, W. Williams, M. B. Wayland, J. Strong

36. Report: 1989 Policy Development Process Overview, dated 5/17/88

37. Memo: Nuclear Energy Quality System Indicators, dated 9/13/88, issued by J. Scarola

38. Report: FPL/TPN Maintenance Department Performance Indicators Week ending 11/17/88, issued by J. E. Cross

39. Report: TPN Availability Improvement Short Term Plan 4.2: Continue to Emphasize Safe Reliable and efficient Operation of Nuclear Power Plants, November 1877, issued by J. S. Odom

40. Turkey Point Nuclear Plant Business Plan

- Documents Reviewed Relative to Element 4.5

Procedure No.	Title
0-ADM-360	Radiation Protection Man/Health Physics Technician Tranining, Dated 3/22/88
0-ADM-701	Plant Work Order Preparation, Dated 10/26/88
0-ADM-714	Conduct of Maintenance Training, Dated 1/26/88
0-HPA-001	Radiation Work Permit Initiation and Termination, Dated 7/9/87
0-HPA-003	Control of Health Physics Records, Dated 7/5/88
0-HPA-006	ALARA Program, Dated 7/9/87
0-HPA-008	Radiological Investigation Reports, Dated 8/31/88
0-HPA-030	Personnel Monitoring of External Dose, Dated 4/30/87

0-HPA-034.2	Determination of Dose to the Skin from Skin Contamination, Dated 7/28/88
0-HPA-060	Respiratory Protection Manual, Dated 10/11/88
0-HPA-066	Selection, Issue, Control, and MPC Hour Accountability of Respiratory Protection Equipment, Dated 5/22/85
0-HPA-070	Decontamination of Personnel, Dated 7/28/88
0-HPS-022	Airborne Contamination Surveys, Dated 8/23/88
0-HPS-045	Release of Material from the Radiation Controlled Area, Dated 8/31/88
0-HPT-013	Portable Survey Instruments, Dated 5/22/85
0-HPT-018	Calibration of Survey Instruments, Dated 4/30/87
0-HPT-019	Calibration of Air Samplers, Dated 9/8/88
0-HPT-064	Operation of the NOMONOX Portable Breathing System, Dated 10/4/88
0-CMM-062.3	Safety Injection System Accumulator Check Valve Repair, Dated 3/17/88
TP-392	Operation of the NOMONOX Portable Breathing System, Dated 10/15/87
0109.6	Temporary Procedures, Dated 8/4/87
0190.14	Quality Assurance Procedures, Dated 9/1/88
11550.80	Qualification of Health Physics Personnel, Dated 4/29/86
3206.2	Residual Heat Removal System - Refueling Interval, Dated 5/26/88
11550.71	Decontamination of Tools, Equipment and Areas, Dated 7/26/88
15650	Breathing Air System Operating Instructions, Dated 12/8/87
0800.169	S. I. Test Valves 856 A&B, Dated 6/2/87

101-002	Breathing Air System/Carbon Monoxide Monitor, Dated 10/23/87
M1101-003	Calibrate Carbon Monoxide Monitor CO1S-6160, Dated 9/20/88
3207.8	Residual Heat Removal Motor-Overhaul and Maintenance, Dated 2/3/87
3207.2	Residual Heat Removal Pump-Disassembly, Repair, Seal Replacement and Assembly

- Documents Reviewed Relative to 4.6

Procedure No.	Title
0-ADM-012	Scaffold Control, Dated 8/24/88
0-ADM-015.1	Chemical Control Program, Dated 3/1/88
0-ADM-015.2	Hazardous Waste Handling and Storage, Dated 10/11/88
0-ADM-702	Heat Stress Control Guidelines, Dated 3/29/85

- Documents Reviewed Relative to Element 4.1

Documents reviewed for this element included: Generic Letter 88-14; FPL Inspection Report, dated October 27, 1987, Rust and Debris Inspection; Memorandum, dated October 5, 1988, Management Presence in the Plant and Attendance at Meetings; and the Monthly Overtime Status Report for the QC organization for the month of November 1988.

- Documents Reviewed Relative to 4.4

The documentation reviewed for this area included: Turkey Point Self Assessment; 0-ADM-701 Prepartion of Process Work Orders; 0-ADM-500 Safety-Related and Quality Related Systems; AP-0190.72 Receipt Inspection, Identification & Control of Safety-Related and Quality Related Parts, Materials & Components; and AP-0190.12 Noncomforming Materials, Parts, and Components.

- Documents Reviewed Relative to 5.1, 5.2, 5.3 and 5.4

The documentation reviewed for this element included: Procedure 0-ADM-701; Preparation of Process Work Orders; Process Work Orders:

WA880611521	WA880922025655	WA880719093039
WA880201322	WA881101154754	WA881700933
WA881130200846	WA881031172055	WA881113125749
WA880707075730	WA881126123755	WA880611525
WA881027104854	WA881116191341	WA881028131006
WA881115152358	WA880611521	WA880611523
WA881061436	WA880221507	WA880425074349
WA880723035535	WA880930111730	WA880930112103
WA880930113053	WA881028050402	WA881029072642
WA881030025441	WA881108141344	WA881130134402
WA881702107	WA1127070941	WA880051526
WA880423101328	WA880881358	WA881111174814
WA881125102357	WA881015053117	WA880010542
WA880681514	WA880221503	WA880806133510
WA881112044056	WA881028131433	WA881009065534
WA880812141706	WA880781335	WA881122122336
WA881114092819	WA881112171530	WA880922025655
WA880624044328	WA880722148	WA873571443
WA881115085653	WA881115090146	WA880726193731
WA871321818	WA880722148	WA881019103144
WA881018122856		

- Documents Reviewed Relative to 5.5 and 5.6

The documentation reviewed for this area included: The POD Daily Schedules; 0-ADM-701; and the Outage Work Listings used to identify upcoming outage work and establish priorities.

Documents (Procedures) Reviewed Relative to 5.8

0-ADM-015.4	AP-0103.11	0-GMM-102.1
0-ADM-015.5	AP-0103.15	0-PMM-022.1
0-ADM-031	AP-0103.40	0-PMM-022.2
0-ADM-100	AP-0103.41	0-PMM-023.3
0-ADM-107	AP-0109.1	0-PMM-102.1
0-ADM-201	AP-0109.3	0-PME-102.3
0-ADM-205	AP-0109.6	0-PME-102.4
0-ADM-209	AP-0109.7	0-GMI-102.1
0-ADM-500	AP-0110.4	0-OP-0209.1
0-ADM-501	AP-0190.4	3-OSP-019.1
0-ADM-502	AP-0190.9	3-OSP-019.2
0-ADM-503	AP-0190.10	4-OSP-019.1
0-ADM-701	AP-0190.14	4-OSP-019.2
0-ADM-703	AP-0190.15	
0-ADM-704	AP-0190.19	0-OSP-023.1
0-ADM-705	AP-0190.28	

0-ADM-706	AP-0190.67	TP-392
0-ADM-707	AP-0190.72	TP-486
0-ADM-708	AP-0190.80	
0-ADM-709	AP-0190.84	
0-ADM-710	AP-0190.86	
0-ADM-711	AP-0190.89	
0-ADM-712	AP-0190.90	
0-ADM-714	MP-0703	
0-ADM-715	MP-0707.14	
0-ADM-716	0-CME-102.1	
0-ADM-717	0-GME-102.1	
0-ADM-718	0-GME-102.4	
0-ADM-900	0-CMM-074.1	

APPENDIX 6
Maintenance
Inspection Tree
Turkey Point