SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

FITZPATRICK NUCLEAR POWER PLANT

Report No. 50-333/93-99

I. BACKGROUND

The SALP Board convened on April 21, 1994, to assess the nuclear safety performance of FitzPatrick for the period April 18, 1993, to April 9, 1994. The board was convened pursuant to U.S. Nuclear Regulatory Commission (NRC) Management Directive (MD) 8.6, "Systematic Assessment of Licensee Performance (SALP)" (see NRC Administrative Letter 93-02). Board members were James T. Wiggins (Board Chairman), Deputy Director, Division of Reactor Safety, NRC Region I (RI); Jacque P. Durr, Acting Deputy Director, Division of Reactor Projects, NRC RI; Charles W. Hehl, Director, Division of Radiation Safety and Safeguards, NRC RI; and Robert A. Capra, Director, Project Directorate I-1, NRC Office of Nuclear Reactor Regulation. The board developed this assessment for approval of the Region I Administrator.

The following performance category ratings and the assessment functional areas are defined and described in NRC MD 8.6.

II. PERFORMANCE ANALYSIS - PLANT OPERATIONS

In the previous SALP, the plant operations functional area was rated Category 2. Operations management oversight was substantially improved and viewed as a major contributor to the improvements noted. The plant had sustained a year long outage and returned to power operation late in the assessment period. Improvements were also noted in licensed operator command and control, communications, and in the quality of abnormal and emergency operating procedures.

During this assessment period, strong performance of the operators was noted throughout the SALP period. The operators successfully maneuvered the plant through normal and abnormal operational transients. These operational transients ranged from normal plant startups and shutdowns to reactor trips. The momentary loss of offsite power during severe weather conditions, the scram associated with the feedwater controller and check valve failure, and the electro-hydraulic control troubleshooting scram were examples of transients that challenged the operator's skills, training and knowledge of the plant. During performance of their duties, operators were professional and thorough; intra-shift communications were complete and effective. One exception to this strong performance occurred early in the SALP period when operators caused the reactor vessel cooldown and heatup rates to be exceeded.

Improved management oversight of operational activities continued through the implementation of a post-transient review group, a 24 hour on-shift outage manager position and a spent fuel pool/refueling floor coordinator. The creation of these positions resulted in

enhanced critiques of transients, better communications and scheduling, and increased safety in operations. Plant management provided a strong presence in all aspects of operations through daily management meetings, field observations and program monitoring. The management observation program permitted identification of problems by managers and promoted first hand knowledge of plant conditions.

Good operational support was evident as indicated by annunciator panels in the control room that had few or no illuminated alarms, and a reduction of catch containments and oil leaks within the plant. However, some fundamental procedures and practices were slow to be developed. For example, until recently, the operations department was limited in its ability to effectively evaluate scrams and did not have a procedure for coping with cold weather. Minor operator performance deficiencies related to valve mispositions and protective tagout oversights continued to detract from overall operator performance. The material condition of the plant improved but operators continued to tolerate marginal housekeeping conditions in some locations of the plant.

In summary, plant operational performance was generally good. Licensed operators provided strong performance by operating the plant in a safe, competent and professional manner. Management oversight continued to improve as evidenced by plant and personnel performance. However, heightened awareness on the part of the operators and management to minor procedural deficiencies and attention to detail is warranted.

The plant operations area is rated **Category 2.**

III. PERFORMANCE ANALYSIS - MAINTENANCE

In the previous SALP, the maintenance functional area was rated Category 2. Overall performance in maintenance/surveillance was good. While some deficiencies and weaknesses were identified, improvement was noted in root cause analyses and material condition of the plant. Initiatives in the areas of procedural quality and planning contributed positively to the performance of maintenance activities. The surveillance testing program was effectively implemented and characterized by good test procedures and knowledgeable staff.

During this assessment period, plant management demonstrated a heightened awareness of the need to identify and evaluate plant deficiencies and implemented high quality problem identification and evaluation systems. The new Deviation and Event Reporting (DER) process was effective in the identification and evaluation of plant deficiencies and was well understood and widely used by plant staff. Root cause analyses and corrective actions performed as part of the new DER process were generally good, detailed, and effective. Implementation of a strong Management Observation Program and thorough discussions of plant deficiencies and corrective actions during Plant Leadership Team meetings demonstrated site management's attention to and involvement in identifying and resolving plant deficiencies.

A conservative approach in resolving plant equipment deficiencies contributed to a sound safety perspective throughout the maintenance organization. For example, when a body-to-bonnet leak was identified on a high pressure coolant injection (HPCI) system check valve, site management shut down the plant and repaired the valve, rather than continue to operate in a degraded condition. A responsible management decision was also made in reducing power and taking the turbine off-line during main turbine electro-hydraulic control troubleshooting efforts. In addition, the safety stand-down implemented during the Fall 1993 outage demonstrated that station management was trending human performance-related events and that a threshold had been met to take corrective actions before a more significant event occurred.

Strong corporate and plant management oversight and direction of maintenance activities led to improved prioritization, planning, and coordination. The 24-hour outage manager position was successfully implemented, facilitating smooth execution of outage activities. The "top 10 issues list" proved to be a good management tool for focusing attention on the important issues.

Good communication and coordination between engineering, operations, radiation protection, and maintenance organizations contributed to a generally effective maintenance program. Examples include repair of a feedwater master controller, resolution of potential electrical separation and single failure concerns, and strong ALARA planning for maintenance work activities.

Maintenance program improvement initiatives and strong plant management involvement contributed to some reduction in the maintenance work request backlog. Initiatives such as the 13 week rolling schedule, integration of the Preventive Maintenance Engineering Group, an expanded work planning staff, and improved outage planning and scheduling facilitated a downward trend in the corrective maintenance backlog. However, continued improvement in planning, scheduling, and work control are necessary to sustain further maintenance backlog reductions.

Overall, the surveillance testing program was effective. Surveillance procedures were good, technicians were knowledgeable, and sufficient supervision was provided; however, significant deficiencies were identified by NYPA in some logic system functional surveillance tests. Although initially slow in starting, the program to review and revise logic system functional tests was comprehensive and effective.

The preventive and corrective maintenance programs have improved and were generally well-implemented. For example, the inservice inspection, molded-case circuit breaker maintenance and testing, and erosion/corrosion programs were effectively implemented and managed. However, some instances of inadequate procedural adherence, poor work control, and untimely corrective actions were noted, especially during periods of high maintenance activity. For example, inadequate procedural adherence resulted in an inadvertent isolation of a reactor water cleanup system valve during calibration activities. Inadequate work

control and planning during electro-hydraulic control system troubleshooting activities resulted in a reactor scram. In addition, failure to implement timely corrective actions contributed to numerous repetitive failures of the reactor feedwater pump discharge check valves.

The quality assurance and self-assessment programs led to improved maintenance quality. Both programs provided site and corporate management with timely and effective assessments of performance.

In summary, proactive and effective corporate and site management oversight and direction of maintenance activities were evident. Improvements were noted in the problem identification, root cause evaluation, and corrective action processes. Good interdepartmental communication, prioritization, and coordination were observed. However, some minor program weaknesses were noted in maintenance planning, scheduling, and work control. In addition, there were some instances of inadequate procedural adherence, poor work control, and untimely corrective actions.

The maintenance area is rated **Category 2**.

IV. PERFORMANCE ANALYSIS - ENGINEERING

In the previous SALP, the engineering functional area was rated Category 3 with an improving trend. Specific improvements were noted in the integration of work activities within the engineering departments. Generally good performance was achieved by both the Site Engineering and the Technical Services organizations. Significant weaknesses, however, were found associated with the resolution of fire protection and 10 CFR 50, Appendix R issues and in management oversight and control of engineering work processes. Problems with drawing control and cable separation also were found.

During this period, oversight and control of work activities in both the Site Engineering and the Technical Services organizations generally improved. Communication and coordination within and between those organizations were good. Corporate management's commitment to improving performance in this area was evident as indicated by the resources and facility improvements that were provided. Some improvements were made to strengthen engineering departmental planning processes. Those improvements resulted in a more reliable system to track requested work and in better planning to support outage activities.

Backlogs of requested work persisted in both the Site Engineering and Technical Services organizations and progress to reduce work backlogs was slow. The inability to promptly reduce those backlogs contributed to delays in resolving some existing or emerging technical issues such as those associated with the main control room ventilation system, QA classification of components, logic system functional testing, and fire protection. Further, they contributed to delays in the handling of some licensing issues.

Engineering work products were good from a technical perspective. Design work was of good technical quality and the plant modification program was effectively implemented. Analyses supporting licensing amendments were sound, and responses to licensing issues such as Generic Letter (GL) 92-04 on reactor water level monitoring and to GL 93-02 on emergency core cooling system sump clogging were appropriate and timely. Some instances occurred, however, early in the period where engineering reviews were not thorough. Examples included the response to problems with the recirculation system riser decontamination connection, problems in a calculation supporting a screenwell level indicator modification, and problems in the installation of a modification that resulted in a loss of shutdown cooling.

In several programmatic activities, performance was noted to be very good. For example, good progress was made in the program to document the design basis of the plant. Also, activities to reduce the backlog of drawings needing revision were being effectively managed.

Engineering personnel were uniformly knowledgeable of their disciplines and of the plant. Although the system engineers were somewhat inexperienced, they were becoming increasingly more effective at identifying and resolving problems with their assigned systems. The engineering training program was backed by a strong management commitment and was achieving good results.

In summary, performance in the engineering area continued to improve. Site and corporate management displayed a commitment to build on those improvements. The technical quality of design and modification work was good. Good performance was noted from both Site Engineering and Technical Services in those programs under their jurisdiction. Planning functions were effective at capturing and tracking requested engineering work activities. However, backlogs in both the Site Engineering and Technical Services organizations have adversely affected the ability to promptly resolve some existing or emerging issues.

The engineering area is rated **Category 2**.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

This functional area is new, representing a significant change from the previous SALPs. The plant support functional area covers all activities related to plant support functions, including radiological and effluent controls, chemistry, security, emergency preparedness, fire protection, and housekeeping.

In the previous SALP, the radiological controls functional area was rated Category 2, and the emergency preparedness and security functional areas were rated Category 1. Performance in the radiation protection area reflected an improving as-low-as-reasonably-achievable (ALARA) program, including better radiological planning for work during both normal and outage operations. The radioactive waste and transportation programs demonstrated continued strong performance. Continued good performance was noted in the dosimetry,

respiratory protection and instrumentation program areas. Weaknesses were identified in the radiological incident reporting (RIR) system and procedural compliance, particularly with radiation work permits. The chemistry, effluent, and environmental monitoring programs remained highly effective. Performance in the emergency preparedness area was excellent with a high quality drill and exercise program that resulted in effective responses to actual events and strong performance during the emergency exercise. The licensee maintained a very effective, high quality performance-oriented security program. Highlighted in the security area were excellent plant and corporate support and a well trained and professional security force.

During the current SALP period, the licensee's radiation protection program performance continued to be good. The dosimetry and instrumentation programs continued to be effectively implemented. ALARA program performance improved with enhanced in-plant reviews and coaching by the ALARA staff, and very effective radiological work planning. Overall good performance during the spent fuel pool cleanup project and the mid-cycle outage demonstrated the effectiveness of these efforts. Very high quality audits and surveillances of the radiation protection area by the licensee's quality assurance staff were effective in identifying performance problems. Incorporation of the RIR action tracking system into the deviation event reporting system significantly improved the tracking of radiological corrective actions. However, procedure adherence problems continued to be identified, including: not following hot particle controls on the refueling floor; not performing or documenting supervisory reviews of radiologically sensitive jobs; failure to properly log out instruments, maintain a drywell activity log, and post weekly surveys; and survey techniques not being performed in accordance with procedures. These instances were identified by the licensee's quality assurance activities; however, corrective actions were not fully effective. Radiological housekeeping was generally acceptable, although the quality of housekeeping in high radiation areas was well below that observed in the general plant.

Performance in the radiological environmental monitoring and effluent control programs continued to be a licensee strength. Highly effective programs for measuring radioactivity in process and effluent samples were identified. An upgraded offsite dose calculation manual enhanced effluent control. The licensee continued to implement an upgrade program for the radiation monitoring system. Quality assurance audits were thorough and of excellent technical quality. An excellent laboratory QA\QC program was noted. The licensee continued to maintain an effective transportation and solid radwaste processing program.

Continued strong emergency preparedness program performance was noted during drills, exercises and a July 1993 event requiring implementation of the emergency plan. The emergency response organization (ERO) was appropriately staffed. ERO personnel were effectively trained as demonstrated by timely and professional implementation of the emergency plan for the July 29, 1993 Unusual Event, and excellent performance during the licensee's quarterly drills and the December 1993 exercise. During that exercise, emergency response facilities were appropriately manned and activated, protective action recommendations were properly determined, and improvements were noted in dispatching

teams from the operational support center. During this period, the technical support center and the operational support center, which were previously dual-use facilities requiring set up for emergency response operation, were converted to dedicated emergency response facilities. The emergency response facilities were effectively maintained and changes to the emergency plan were appropriately reviewed.

The licensee continued to implement a very effective, high quality performance-oriented security program. Management attention and involvement continued at a high level, evidenced by further program improvements and enhancements. Upgrades included new access control equipment, new computer software for enhanced assessment, and portions of the protected area lighting. Maintenance support of security equipment was aggressive, demonstrated contingency capabilities were excellent, and the audit and self-assessment programs were effective. The security staff was well trained and highly professional.

Implementation of the fire protection program continued to improve during this period. Licensee review and upgrading of fire protection surveillance tests resulted in the identification and resolution of several testing deficiencies. Continued actions on previous deficiencies resulted in development of good fire protection design basis documents and program plans. Although plant housekeeping was generally good, the fire protection program was not effective in resolving a continuing problem with the control of combustible materials.

The plant support functions significantly contributed to safe plant performance. Radiation protection area performance continued to improve. However, procedure adherence problems continued to occur. Radiological housekeeping was generally good with noted exceptions in some high radiation areas. Excellent performance in the radiological effluent and environmental monitoring programs were again noted. There was continued strong performance in the emergency preparedness area. A number of important improvements were made to the emergency response facilities, which enhanced performance in the emergency planning area. Security program performance continued to be outstanding. Fire protection program implementation continued to improve.

The plant support area is rated **Category 2**.