Enclosure 1

Systematic Assessment of Licensee Performance (SALP)

FitzPatrick Nuclear Plant

Report No. 50-333/97-99

I. BACKGROUND

The SALP Board convened on July 10, 1997, to assess the nuclear safety performance of the FitzPatrick Nuclear Plant for the period from November 19, 1995, through June 28, 1997. The Board was conducted pursuant to NRC Management Directive (MD) 8.6 (see NRC Administrative Letter 93-20). The Board members were Charles W. Hehl (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI), Larry E. Nicholson, Deputy Director, Division of Reactor Safety, RI, and S. Singh Bajwa, Acting Director, Project Directorate I-1, NRC Office of Nuclear Reactor Regulation. The Board developed this assessment for the approval of the Region I Administrator.

The performance ratings and the functional areas used below are described in NRC MD 8.6, "Systematic Assessment of Licensee Performance (SALP)."

II. PERFORMANCE ANALYSIS - OPERATIONS

Overall performance in the operations area was good. Operation of the plant was generally good with a conservative approach demonstrated. However, personnel errors stemming from a lack of attention to detail and failure to exhibit a questioning attitude resulted in several challenges and plant transients. In addition, problems with implementation of the work control and equipment configuration control programs were noted.

Operations and site management were involved with and focused on plant activities. A low threshold for the self-identification of equipment, program and personnel performance issues was apparent. Generally, corrective actions were effective. Operations and training department self-assessments led to a number of initiatives to improve. Some program changes include the application of peer checking and additional coaching by managers and supervisors. Effective pre-evolution briefs were conducted, and site management oversight during complex and abnormal evolutions contributed to safe plant operations. Management was effective in reducing operator work arounds to reduce operator burdens and challenges.

A conservative approach to operation of the plant was demonstrated on several occasions by management decisions to initiate plant shutdowns when degraded equipment conditions were identified. A manual scram was directed in December 1996 due to an electrohydraulic system leak and in May 1997 the unit was taken off-line because of a degraded 345 KV bolted connection. However, management expectations and standards were not followed by the staff during the March 1997 performance of a training evolution involving a control rod manipulation. Additionally, concerns were identified with the work control process related to the conduct of some risk significant activities, specifically the

September 1996 relay calibration and the January 1997 traveling water screen maintenance.

Routine operator performance and response to plant transients during this period were typically good. Plant evolutions were performed with good regard to safety and operators displayed a conservative approach to plant operations during events. For example, when a turbine control valve failed in May 1997, operators were briefed and stationed at appropriate panels in preparation for a manual scram. The operator response to these challenges caused by equipment or personnel performance problems were safe and well controlled. In contrast, operator performance errors during the response to a September 1996 scram and associated equipment problems revealed some weaknesses in operator knowledge and skill level.

Personnel errors continued to result in instances of inconsistent performance during plant operations. In some instances, the staff failed to exhibit a questioning attitude and attention to detail. For example, the failure to adhere to procedures and control room information contributed to a control rod mispositioning event in March 1997. Additionally, during that event, independent verification and self checking were not performed.

Equipment configuration control, particularly for activities associated with protective tagouts, was a recurring problem from the previous SALP period. Errors in administering the protective tagout process led to improper restoration of equipment such as an emergency diesel generator service water throttle valve and a residual heat removal system drain valve. Some weaknesses in the control of work activities were also observed, the most noteworthy being the aforementioned January 1997 disabling of the automatic start function for 2 of the 3 travelling screens to perform maintenance which caused, in part, a plant transient from low intake service water level.

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

III. PERFORMANCE ANALYSIS - MAINTENANCE

Performance in the maintenance area was good. Managers and supervisors were routinely in the plant assessing maintenance activities and providing direction. Appropriate actions were taken when equipment problems arose or were identified during predictive maintenance activities. Departmental self-assessment and oversight by the Quality Assurance organization contributed to the effective conduct of maintenance. Management generally initiated timely and appropriate corrective actions to deal with programmatic issues and industry experience information.

The plant material condition improved during this period as corrective maintenance backlogs were slowly reduced. Equipment reliability was generally very good with few repetitive equipment failures or plant shutdowns for degraded equipment, although lapses in the quality of maintenance activities and decisions impacted plant operations on two occasions. Inadequate maintenance performed on a bypass valve caused an electro-hydraulic control system leak and resulted in a manual reactor scram in December 1996. In May 1997 a manual reactor scram was necessary due to the failure of turbine control

valve bolting. An inspection of this valve was not performed during the previous outage as recommended by the vendor. Troubleshooting and evaluations to determine equipment failure mechanisms were generally thorough.

Generally good performance of maintenance and surveillance activities was achieved, in part, because of procedure adherence and supervisory oversight and was reflected in a low rework rate and high equipment reliability. Examples of well planned and conducted maintenance evolutions included the battery replacement and the scram solenoid pilot valve diaphragms projects. The maintenance staff was knowledgeable of their assigned tasks, well trained and generally adhered to procedures. However, several examples of lapses in performance occurred midway through the SALP period. A noteworthy example involved a technician who shorted a 345 KV distribution relay in September 1996, resulting in a reactor scram. An additional example included a personnel error by technicians while shutdown in October 1996 that resulted in the incorrect identification of control rod drives (CRDs) to be removed for maintenance. Three CRDs were removed before the error was identified. These errors were generally attributable to inattention to detail and poor worker practices. Management took a number of actions in early 1997 to improve human performance including additional coaching and oversight by management in the field, work standdowns and training. The effectiveness of these corrective actions has yet to be fully demonstrated, although the human error rate was declining at the end of the SALP period.

While efforts to improve the work control program contributed to better performance, some work control weaknesses, evident during the last SALP period, persisted and impacted on plant operations. These work control process weaknesses involved job planning and risk evaluations, work package deficiencies, limited supervisory oversight and poor questioning attitude. These weaknesses contributed to several plant events. Corrective actions to address these weaknesses have been ongoing since the Fall of 1996, however, problems in work control persisted indicating continued management attention is required in this area.

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

IV. PERFORMANCE ANALYSIS - ENGINEERING

The overall performance of engineering continued to be good. Self-assessment and quality assurance activities resulted in identification of engineering performance improvement opportunities. Management review committees provided effective oversight of the corrective action program as evidenced by their identification and tracking of recent performance issues involving a lack of engineering rigor in the conduct of design activities and the quality of event responses. The corrective action monitoring report was a good tool for assessing the quality and timeliness of corrective action plans. Thorough extent of condition reviews resulted in comprehensive and effective resolutions of previous problems with control of environmentally qualified fuses and design-basis calculations. However, corrective actions for selected equipment issues were not fully successful. Examples included the failure to implement proposed modifications to preclude spurious engineered

safety features actuations during surveillance testing and to prevent spurious residual heat removal pump trips; as a result, these events recurred during this period.

Engineering support of operations and maintenance activities was effective. Operability determinations and root cause evaluations were timely and based on sound engineering principles. For example, comprehensive equipment failure evaluations for local leakage rate test failures resulted in improved performance over the last several operating cycles, and a thorough safety evaluation for a new reactor vessel instrumentation reference leg back fill system was performed. System engineer monitoring of system performance and interaction with other plant organizations to resolve material condition deficiencies was generally effective. For example, engineering oversight of safety-related air treatment system performance was excellent. Activities performed under specialized engineering programs such as inservice testing and primary containment local leakage rate testing were well administered and implemented. Responses to industry operating experience occasionally lacked depth, but were good overall. A focused radiation monitor program resulted in significant improvement in system reliability. Engineering involvement was effective in reducing control room deficiencies and operator workarounds. However, a continuing challenge exists with the large number of outstanding engineering work items which includes design basis, material substitution, and long-term plant modification issues.

While modifications were generally implemented effectively and drawings, procedures, and other design basis documents were revised appropriately, several instances occurred in which formal configuration controls were bypassed and safety evaluations were not performed as required. Examples included modification of certain air-operated valves via procedure changes versus the modification process, installation of a temporary blower and high efficiency filter in a residual heat removal heat exchanger room, and operation of both residual heat removal system trains in the suppression pool cooling mode for a test. In addition, design control problems were noted in some instances involving verification of design inputs, performance of design-basis calculations, and translating design requirements into test procedures. For example, test control requirements for battery service tests and inservice testing of residual heat removal service water pumps were not met and evaluations of high pressure coolant injection pump vortexing and the modeling of a new decay heat removal heat exchanger used unverified engineering assumptions and judgement.

While efforts have been made to review and improve retrievability of design basis information, some lapses in tracking related corrective actions occurred. Significant efforts at design basis document development, design document recapture and reconstitution, and drawing backlog reduction were made. However, open items identified in the design basis documentation program were not always formally tracked and evaluated promptly for corrective action. Improvement efforts in this area are ongoing in response to the design control weaknesses identified above and the 10 CFR 50.54(f) response commitments.

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

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

The occupational radiation protection program was generally effective. Positive initiatives were noted in radiation worker and radiation protection technician training and performance. The ALARA program continued to make significant, positive contributions to the radiation protection program.

In contrast, several significant problems occurred involving the failure of radiation workers to adhere to radiological control barriers and procedures. In two separate incidents, workers escorted unauthorized persons into a radiologically controlled area. On another occasion, a radiation worker was in a posted locked high radiation area for three hours with his alarming dosimeter turned off. In addition, several less significant problems were identified where radiation workers failed to comply with radiological procedures and postings. Continued management attention is needed to ensure adequate implementation of radiological controls and procedures.

The program for radioactive waste management and transportation of solid radioactive waste was effective, and the radioactive waste facilities were generally well maintained. The licensee's program for radiological effluent control continued to be excellent. The radiological environmental monitoring program, meteorological monitoring program, and quality assurance/quality control of analytical measurements exhibited very good performance. However, management actions to correct recurring problems concerning the certification of technicians responsible for radioactive waste shipping were slow.

The implementation of the emergency planning (EP) program continued to result in excellent performance. Very good oversight and implementation of the EP program was demonstrated by the licensee. The emergency response facilities and equipment were determined to be in a very good state of readiness. The licensee, in conjunction with Nine Mile Point, built an enhanced joint news center adjacent to the emergency operations facility. Management involvement was good as noted by their participation in training, drills, and the emergency response organization. The licensee effectively implemented its emergency plan during the unusual event on September 16, 1996. Event classification and off-site notification was appropriate and timely.

The security program continued to show excellent performance. The working relationships between the security and maintenance departments were excellent as evidenced by the security equipment being properly maintained. The planning, installation and quality of the security system upgrades demonstrated management attention and support.

Housekeeping has remained good. Observations on housekeeping were made periodically throughout this assessment period, and the evaluations were generally positive.

The Plant Support area was rated **Category 2**.

ENCLOSURE 2

FITZPATRICK PLANNED NRC INSPECTIONS

AUGUST 1997 - AUGUST 1998

RI = Regional Initiative
CO = Core Inspection (NRC Program Inspections, excepting Resident Core Activities)

PROCEDURE NUMBER	TITLE	DATE
CO 81700	Physical Security Program	8/25/97
CO 37550	Engineering Visit #1	9/08/97
CO 84750	Radioactive Waste Treatment & Effluents	9/08/97
Special HQ Team	Operational Safeguards Response Evaluation (OSRE)	9/15/97
RI 62706	Maintenance Rule Team Inspection	9/29/97
CO 37550	Engineering Visit #2	10/13/97
CO 86750	Solid Radwaste Management	10/27/97
TI 2515/133	Temporary Instruction Regarding Compliance with 49 CFR Parts 100-179 MOV Testing	10/27/97
CO 37550	Engineering Visit #3	2/16/98
CO 83750	Occupational Radiation Exposure	6/15/98
CO 40500	Effectiveness of Licensee Controls in Identifying, Resolving and Preventing Problems	8/10/98
CO 64704	Fire Protection Program	8/24/98
CO 82701	Emergency Preparedness program	TBD