SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

NINE MILE POINT NUCLEAR POWER STATION

REPORT NOS. 50-220,410/96-99

I. BACKGROUND

The Systematic Assessment of Licensee Performance (SALP) Board convened on June 19, 1996, to assess the nuclear safety performance of the Nine Mile Point Nuclear Power Station, Units 1 and 2 for the period January 29, 1995, through June 1, 1996. 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). The board members included James T. Wiggins (Board Chairman), Director, Division of Reactor Safety, NRC Region I (RI); Susan F. Shankman, Acting Deputy Director, Division of Reactor Projects, NRC RI; and Jocelyn Mitchell, Acting Director, Project Directorate I-1, NRC Office of Nuclear Reactor Regulation. The board developed this assessment for the approval by the Region I Administrator.

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

II. PERFORMANCE ANALYSIS - OPERATIONS

The NRC SALP Board rated the plant operations area as Category 1 in the previous SALP period. Overall performance improved during that period. Operators exhibited a questioning attitude that resulted in early identification of degraded equipment conditions, often averting a plant transient. When challenged, operators responded very well to events. Management involvement and oversight resulted in effective licensed operator training programs. The operations departments supported and utilized self assessments. A few instances of personnel error by operators occurred, but they were generally of an isolated nature and of low safety significance.

During the current assessment period, the safety focus of the organizations involved in day-to-day operations continued to be excellent. Effective management oversight contributed to the strong performance in this area. Operations management and senior station management were frequently observed reinforcing their expectations concerning good practices both in the control room and during simulator training evaluations. Although the focus of the operations organization on awareness of plant conditions was already strong at the beginning of the period, it was further strengthened in that both units were successful in achieving and maintaining a "blackboard" status on the main control board annunciators. During outages, the licensee established work control centers at both units that were remote from the control room; experienced senior level operators reviewed and approved the work, thereby allowing the control room staff to focus on safe plant operations and to maintain a professional control room environment.

The performance of the operations staff was generally strong, with superior performance exhibited during the latter part of the period. Operator response to a Unit 2 reactor scram during startup testing was appropriate and well controlled by the shift crew, with a thorough post-scram assessment by middle

management. When a Unit 1 reactor feedwater pump tripped, quick actions by the operators averted a reactor scram. During initial examinations for licensed operators, performance was very good, with effective use of self-checking and peer verification. However, early in the period, several instances occurred in which operator inattention resulted in plant transients. Two examples were: (1) the Unit 1 reactor recirculation pump (RRP) runback, which resulted in indicated flow being in an unexpected region of the power-to-flow map, and (2) the failure of Unit 2 operators to properly restore the residual heat removal system following a surveillance test. These and other instances reflected a decline in performance compared with the prior SALP period and reflected a weakness in the organization determining the underlying causes of personnel performance errors. This decline was generally reversed during the latter part of this period.

The identification of problems by the operations department through the use of the deviation/event report (DER) process was generally strong. Because an alert reactor operator noted that plant conditions were inconsistent with core thermal power as indicated by the plant computer, a faulty feed flow signal was identified. Also, during surveillances and plant rounds, operators and supervisors paid particular attention to equipment required for safe shutdown. Staff operators and supervisors generated DER's to evaluate and resolve problems with important equipment; work orders were appropriately used for less important repairs. However, the NRC staff continued to find more than minor problems that were not identified by the licensee's staff. Examples included: (1) a containment isolation valve that was not locked as required and (2) nitrogen tank low pressure and low level annunciators that did not alarm when the tank was empty.

Procedural weaknesses have resulted in the operators being unnecessarily hampered during surveillances and other routine evolutions. A noteworthy example was the procedure for filling and venting the Unit 2 reactor water cleanup system that, when implemented, resulted in briefly exceeding the system design pressure.

The Unit 2 licensed operator requalification training program stayed current with plant issues, thereby meeting the needs of the operators. However, the Unit 1 training program exhibited weak implementation and the licensee did not always clearly express training objectives. As a result, examinations were not a consistently effective tool for evaluating operator performance.

In summary, operations management provided effective oversight of activities. Operations personnel demonstrated a clear safety perspective and a questioning attitude. Response to events was appropriate and well controlled. Operations personnel generally performed well and exhibited superior performance in the latter part of the SALP period. The decline in operator performance that was noted early in the period reflected a weakness in the organization determining the underlying causes of personnel performance errors. In addition, sporadic problems with procedure adequacy unnecessarily challenged the operators during routine evolutions.

The plant operations area is rated as Category 1.

III. PERFORMANCE ANALYSIS - MAINTENANCE

The NRC SALP Board rated the maintenance area as Category 2 in the previous SALP period. Although the NRC staff noted a generally good program for conducting maintenance, recurring problems with inattention to detail, assessment of the impact of maintenance activities on the plant and weaknesses in adherence to procedures detracted from overall performance. Many of the plant transients to which operators responded resulted from personnel errors related to maintenance.

During this period, managers were generally involved in the conduct of maintenance and fostered good coordination among the various departments that performed work at the two units. Management paid significant attention to maintenance activities during outages to ensure good performance. This attention was evident in their involvement in strategy meetings, planning meetings, and in-plant monitoring of work activities. The core shroud modification and installation, a major outage activity, was well planned. The licensee dealt very well with problems that developed during installation. The NRC staff noted a strong focus on maintaining safety system readiness at both units; the licensee decreased corrective maintenance backlogs and maintenance was properly prioritized and completed in a timely manner.

The performance of maintenance personnel throughout the majority of the SALP period was generally good, including roles in the planning and execution of maintenance tasks at both units. The performance of maintenance supervisors and workers in response to emergent equipment issues was of high quality and properly focused on plant and personnel safety. Although there was an overall improvement in the performance of maintenance activities during this period compared with the previous period, some performance problems remained. One significant example that occurred early in the period involved the runback of all Unit 1 RRPs and a subsequent turbine trip, which occurred because personnel did not follow a work order. Shortly thereafter, an auxiliary operator error while performing a surveillance on Unit 2 caused a loss of both recirculation pumps. Also, at both units, a notable number of surveillance tests that were required by technical specifications were not performed because of personnel errors.

Plant personnel readily identified equipment deficiencies. They used the DER system well and the DER system was generally effective in the maintenance area. However, the tracking and reporting of the status of corrective actions and the verification of implementation of maintenance corrective actions associated with DERs, self-assessments, Independent Safety Engineering Group (ISEG), and quality assurance (QA) recommendations were not sufficient to ensure that the required actions were effectively implemented. Also, the licensee's corrective actions for past events involving human performance errors had not been effective in preventing the Unit 1 RRP runback event that occurred early in the SALP period. However, as a result of revised programs and procedures for performing maintenance, the NRC staff noted an overall improvement in maintenance at the end of the SALP period. Use of the new maintenance training program, "Dynamic Learning Activities," was a good initiative and provided an effective means of training maintenance personnel to function as a team and of communicating management expectations for work control and performance of maintenance.

The licensee's efforts to maintain the material condition of the plants were generally effective. Material conditions in both units improved. Also, progress in decontaminating floor spaces of Units 1 and 2 continued. However, the NRC staff noted specific instances of minor material condition problems, such as steam leaks on the Unit 1 emergency condenser system, fuel and lubricating oil leaks on the Unit 2 emergency diesel generators, a large number of catch containments to contain system leakage, and rain water dripping onto high voltage electrical equipment.

In summary, maintenance management was generally involved in day-to-day maintenance work and also directed a particularly noteworthy level of attention to maintenance activities during outages to ensure good performance. The NRC staff observed that a strong focus on maintaining safety system readiness at both units was evident in the reduced corrective maintenance backlog. Personnel performance in this area improved as compared with the previous period, but some performance problems continued to arise. The licensee effectively used the corrective action process to identify problems, but tracking and followup of corrective actions were weak in ensuring corrective action effectiveness. Revised programs and procedures resulted in an overall improvement in performing maintenance at the end of the SALP period. The licensee's efforts to properly maintain the material condition of the plants were generally effective; however, the NRC staff continued to observe deficiencies.

The maintenance area is rated as Category 2.

IV. PERFORMANCE ANALYSIS - ENGINEERING

The NRC SALP Board rated the engineering area as Category 2 in the previous SALP period. Engineering management provided strong oversight of engineering activities. The quality of most engineering work was very good, but there were some lapses. The evaluations of deviations by the engineering organization were thorough and technically sound. Engineering and technical support personnel were competent and well trained. However, the NRC staff noted weaknesses in the timeliness of the submittal of license amendments and code relief requests. Incomplete environmental assessments in licensing submittals continued to be a weakness.

During this period, engineering management continued to provide very good oversight of activities. Plant modifications, including temporary modifications, were well managed and controlled. Further, progress continued in the reduction of the backlog of engineering work activities. For example, the licensee made substantial progress in reducing both the total number and the duration of outstanding temporary modifications. Senior station managers actively monitored engineering performance and took appropriate actions to address weak areas. Both engineering and technical support staff interacted well with operations and maintenance in day-to-day operations.

The engineering organizations provided, in general, design work and technical support of good quality and they remained actively involved in resolving plant problems. Examples of their efforts included the reactor vessel core shroud analyses and the shroud repair, the battery capacity calculations associated

with station blackout, and the analyses in support of the Unit 2 power uprate amendment. The engineering organizations also performed thorough and technically accurate operability determinations. However, there were some activities in which the engineering organization exhibited problems in quality or timeliness. These types of problems continued from the last SALP period. Examples of these problems included a poor and untimely response to the identification of oversized bolts in the Unit 1 turbine building and reactor building blowout panels, design quality problems associated with service water check valve replacements, and design quality problems with the radwaste cask rigging device. Further, some Unit 2 systems had longstanding hardware or operability problems. Examples of these systems included the loose parts monitoring system, the emergency diesel generator air start system and the standby gas treatment system. Technical analyses for most licensing submittals were complete and timely.

The program for the design and implementation of plant modifications was well defined and generally well implemented. Unit 1 had a very good torus corrosion monitoring program, while Unit 2 had an extensive operational trending program on the emergency diesel generator. However, NRC inspection identified a relatively weak motor-operated-valve (MOV) program, which had been initiated in response to Generic Letter 89-10. The DER process was used extensively and the deficiencies documented had a wide range of significance. However, when licensee personnel resolved a DER, the resolution was not formally and routinely communicated between units and DER resolutions were not effectively trended. Further, a number of Unit 2 DERs failed to contain justifications for extensions of their completion dates.

The licensee's procedures governing the 10 CFR 50.59 process were easily traceable to organizational level policy documents and were implemented through Nuclear Division Directives. However, the use of the temporary modification procedure allowed for the installation of emergency temporary modifications before the completion of a 10 CFR 50.59 safety evaluation. Further, the licensee failed to complete an evaluation to justify running the plant for over a year with a nonconservative difference between the design and actual relief pressures for the reactor building and turbine building blowout panels. Also, no safety evaluation was performed in support of a minor change to the description of the service water system in the Updated Safety Analysis Report because of an inappropriate screening decision.

System engineers were knowledgeable about their systems and equipment, and they performed proactive activities, such as system walkdown inspections and equipment trending, to detect abnormalities before failures could occur. They effectively used performance monitoring programs, such as vibration monitoring, heat exchanger performance monitoring, and thermography. They maintained good communication with maintenance, design engineering, and operations.

In summary, engineering performance with respect to both units was good. Engineering management provided appropriate oversight of activities and implemented effective actions to reduce the backlog of engineering work activities. In general, the quality of engineering design and analysis activities was good, but the NRC staff noted several instances of weak or

untimely performance. Performance of engineering programs varied; for example, the emergency diesel generator operational trending program was effectively implemented, but the implementation of the motor-operated valve program was weak. The DER program was effectively used to document problems, but the results of the program were not trended well or consistently shared between units. System engineers effectively monitored their assigned systems. Both engineering and technical support staff interacted well with operations and maintenance in day-to-day operations.

The engineering area is rated as Category 2.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

The NRC SALP Board rated the plant support area as Category 2 in the previous SALP period. The NRC staff noted good performance in the radiological protection program, with excellent performance in maintaining radiation exposures as low as is reasonably achievable (ALARA). Strong performance continued in the radiological effluents and environmental monitoring programs. Weaknesses in emergency preparedness involved communications to emergency workers and protective action recommendations. Performance in security was good; however, some problems existed with control of safeguards materials and with contingency drills. Fire protection and housekeeping were generally very good.

In this period, radiological protection program performance continued to be good overall. The licensee continued to implement an effective ALARA program throughout the station. Restricted areas of the units were posted clearly and correctly. The self-assessment and QA audit programs associated with the radiological protection and radwaste areas were well implemented and were conducive to maintaining good performance. Radiation protection and ALARA technicians were frequently in the plants coaching radiation workers in the performance of their work activities. Notwithstanding this positive performance, both radiation protection and radiation worker human performance problems occurred throughout the period. These problems typically involved improper entry to or exit from the radiologically controlled area and lack of adherence to radiation work permits. Strong performance continued in the radiological effluents and environmental programs, and the licensee effectively implemented its radiological chemistry program as demonstrated by the very good agreement between analysis results from test specimens split with the NRC's mobile laboratory.

The security program was well implemented. Security personnel performed their duties effectively. Security force members (SFMs) were knowledgeable of their duties and professionally approached those duties. Equipment, particularly the intrusion detection system, performed reliably. However, some problems with attention to detail occurred. For example, SFMs at access points did not always have specific work instructions at their posts, assessment aid equipment malfunctions were not always promptly reported to security force managers for timely corrective action, and security training records did not clearly differentiate between completion of weapons qualifications and weapons familiarization training. The fitness-for-duty program was generally well implemented; however, a problem existed with the process used to select

individuals for random testing.

In the emergency preparedness area, the program was well established through the documented plan and procedures. Good command, control and communications occurred during drills and exercises, as well as thorough and generally effective critiques of performance during those evolutions. The licensee had provided for a generally effective transition to the use of industry guidance concerning emergency action levels (EALs) during this period. However, recurring problems in event classification during exercises occurred. These problems indicated a weakness in those actions designed to develop proficiency in the use of EALs by operating crews. The latest exercise showed improvement in this regard. Although emergency response facilities were generally well maintained, the licensee had not tested the ventilation filter in the technical support center since 1993, suggesting a program oversight weakness.

Licensee management applied a significant level of effort to correcting some longstanding problems with the fire protection systems at both units. Specifically, the licensee corrected a number of conditions that caused trouble alarms, Unit 2 achieved an alarm-free board on fire panels, and Unit 1 showed a reduction in alarming conditions.

Housekeeping in both plants was generally good, given storage issues that are routinely found in older plants such as Unit 1. In Unit 2, the licensee could not provide evidence that an engineering analysis had been performed for the scaffolding around the standby liquid control tank, even though the scaffolding had been in place for several years.

In summary, good performance continued in the radiological protection program. Programs to maintain radiological exposures as low as is reasonably achievable (ALARA) were effective. The radiological effluents, environmental monitoring, and chemistry programs remained strong. Security program performance was good, although the NRC staff noted some instances of inattention to detail. The emergency preparedness program was well established and maintained. The NRC staff noted recurring problems with event classification during most of the period, but the licensee showed improvement during the latest exercise. Fire protection and housekeeping were generally very good.

The plant support area is rated as Category 2.

July 24, 1996

INSPECTION PLAN FOR NINE MILE POINT UNITS 1 AND 2

IP - Inspection Procedure
TI - Temporary Instruction
Core Inspection - Minimum NRC Inspection Program (mandatory all plants)

INSPECTION	TITLE/ PROGRAM AREA	PLANNED START INSPECTION DATES	TYPE OF INSPECTION - COMMENTS
TI 2515/127	Access Authorization	7/8/96	Safety Issue Inspection
IP 84750	Radwaste Treatment, Effluent, & Environmental Monitoring (Environmental)	7/22/96	Core Inspection
IP 83750	Occupational Radiation Exposure - Outage	10/7/96 - Unit 2	Core Inspection
TI 2515/109	MOV GL 89-10 Program Closure	10/7/96 (2nd week 10/21/96)	Safety Issue Inspection
IP 62706	Maintenance Rule	10/7/96 - Unit 1	Core Inspection
IP 73753	Inservice Inspection	12/9/96 - Unit 2	Core Inspection
IP 83750	Occupational Radiation Exposure - Outage	2/17/97 - Unit 1	Core Inspection
IP 73753	Inservice Inspection	2/24/97 - Unit 1	Core Inspection
IP 81700	Physical Security (Visit 1)	2/24/97	Core Inspection
IP 64704	Fire Protection Program	5/5/97	Core Inspection
IP 82701	Operational Status of the Emergency Preparedness Program	7/14/97	Core Inspection
IP 82302	Review EP Exercise Objectives and Scenario	7/21/97	Core Inspection

INSPECTION	TITLE/ PROGRAM AREA	PLANNED START INSPECTION DATES	TYPE OF INSPECTION - COMMENTS
IP 71001	Licensed Operator Requalification Program Evaluation	2nd Qtr 97 - Unit 1	Core Inspection
IP 83750	Occupational Radiation (Visit 1)	4/21/97	Core Inspection
IP 83750	Occupational Radiation (Visit 2)	6/16/97	Core Inspection
IP 81700	Physical Security (Visit 2)	6/23/97	Core Inspection
IP 61725	Surveillance Testing Program	2nd Qtr 97	Regional Initiative: Weakness in scheduling of mode-related and other non-periodic surveillance and technical adequacy of surveillance procedures
IP 86750 and TI 2515/133	Solid Radwaste Management & Transportation Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71	8/10/97	Core Inspection Safety Issue Inspection
IP 84750	Radwaste Treatment, Effluent & Environmental Monitoring (Effluent)	9/8/97	Core Inspection
IP 82301	EP Exercise - Full Participation	9/22/97 (Unit 1) (also appl. Unit 2)	Core Inspection
IP 71001	Licensed Operator Requalification Program Evaluation	4th Qtr 97 -Unit 2	Core Inspection
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems	2nd Qtr 97	Core Inspection

INSPECTION	TITLE/ PROGRAM AREA	PLANNED START INSPECTION DATES	TYPE OF INSPECTION - COMMENTS
IP 37550	Engineering (Visit 1)	10/7-11, 10/21-25/96	Core Inspection
IP 37550	Engineering (Visit 2)	3/10-14,3/24-28/97	Core Inspection
IP 37550	Engineering (Visit 3)	8/25-29, 9/8-12/97	Core Inspection
IP 37001	10 CFR 50.59 Safety Evaluation Program	2nd Qtr 97	Regional Initiative: Weakness in quality of evaluations and implementation of screening criteria (DRP/NRR)
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems	1st Qtr 97	Regional Initiative: Weakness in quality of resolution and tracking/trending. Review DER identification, root-cause analysis, and tracking and trending across all program areas (DRP)
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems	2nd Qtr 97	Regional Initiative: Weakness in identification of longstanding design/equipment issues. Perform integrated review of the processing and assessing of operating experience reviews (DRS)
IP 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems	3/17-21/97	Regional Initiative: Weakness in the ISEG contribution to licensee reviews of NRC bulletins and information notices. Review role of ISEG, including its internal controls/procedures (NRR)
		11/8/97	End of SALP Period