Enclosure 1

Systematic Assessment of Licensee Performance (SALP)

Indian Point Nuclear Generating Station Unit No. 3

Report No. 50-286/96-99

I. BACKGROUND

The SALP Board convened on March 12, 1996, to assess the nuclear safety performance of the Indian Point Nuclear Generating Unit No. 3 for the period from August 16, 1992 to March 2, 1996. The Board was conducted pursuant to NRC Management Directive (MD) 8.6 (see NRC Administrative Letter 93-20). However, because of the protracted length of this SALP period, during the majority of which the plant was in a performance improvement outage, the SALP board did not focus on plant performance prior to 1995 as a baseline for evaluating your recent performance trends. Consequently, the SALP board used the April 1995 Readiness Assessment Team Inspection (RATI) and the bases for the NRC allowing plant restart (as documented in our June 19, 1995, letter to you) as a measure of your performance and readiness for restart. Docketed inspection findings and assessment conclusions up to the end of the SALP period were also used by the SALP board in arriving at performance conclusions.

The Board members were Richard W. Cooper, II (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI), James T. Wiggins, Director, Division of Reactor Safety, RI, and Ledyard B. Marsh, 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

The Readiness Assessment Team Inspection (RATI) in April 1995 focused heavily in this performance area and noted that operating crew performance during plant evolutions was good. Significant improvements were made in Operations administrative procedures, shift staffing and the shift turnover process. However, weaknesses associated with routine operations were noted, including the control of plant configuration, communications and the oversight of shift activities. Some alarm response procedures needed additional technical detail and a substantial number of procedures awaited upgrading under the Procedure Upgrade Program (PUP).

During this period, performance in the Operations area was adequate. Management generally took a conservative approach to plant operations as evidenced by repeated delays in restarting the plant to correct equipment deficiencies such as the reactor vessel flange O-rings and the 34 steam generator S/G handhole leak. Senior plant and corporate managers demonstrated a strong presence in the plant and involvement in the operation of the plant on a routine basis; however, this level of oversight was not fully effective in ensuring that management expectations were consistently promulgated and implemented. On several occasions, operators did not perform in a manner

consistent with management expectations such as: 1) the July 1995 operation of the reactor coolant system (RCS) at reduced pressure, 2) the heatup in October 1995 with the control switches for both containment spray pumps and both recirculation pumps in trip pullout, 3) the December 1995 component cooling water (CCW) relief valve lifting event, and 4) the recently identified failure of the Nuclear Plant Operators (NPOs) to routinely tour two contaminated rooms in the Primary Auxiliary Building.

Plant restart in June 1995 was generally well handled and operators responded well to events. However, there were events, such as those mentioned above, which demonstrated that performance during the period was inconsistent. These events indicated that operators sometimes demonstrated a lack of questioning attitude, as evidenced by the number of material deficiencies they failed to identify late in the SALP period and the lack of appropriate action during some events (e.g. during the January 1996 loss of offsite power event, the reactor operator did not take timely action after being informed of the emergency diesel generator (EDG) room ventilation failure). Further, several plant challenges were caused by surveillance procedures which did not support plant conditions and could have been prevented had the operators better questioned the impact of the testing on the plant. Significant, noteworthy efforts were devoted by management to improving operator performance in the last three months of the SALP period, although the effectiveness of these corrective actions remains to be seen, particularly in the long-term.

Problems in the material condition of the plant significantly challenged the operators. Plant heatup and power operations were terminated on five separate occasions during this SALP period due to material deficiencies such as the reactor vessel O-ring seal leakage, service water system corrosion, the S/G handhole leakage, poor cleanliness of the main boiler feedwater pump control oil system, and a generator hydrogen leak. The prolonged forced outage, beginning in September 1995 and ongoing at the close of the SALP period, forced the Operations organization in particular, and the plant organization in general, to react to emerging problems and delayed their focus on planned long-term performance improvements.

Procedure quality and adherence weaknesses provided obstacles to consistent performance and contributed to several plant events (e.g. the engineered safety features (ESF) switches in trip pullout and the operation of the RCS at reduced pressure). Progress in upgrading Operations procedures slowed significantly after plant restart in June 1995 and was not accelerated until operator performance and procedure weaknesses were clearly evident in October 1995. In the latter three months of the SALP period, significant progress was made in the Procedure Upgrade Program (PUP) and operator adherence to procedures was found to have improved. However, examples of weaknesses in administrative procedure usage (e.g. performance or completion of Operating Directives governing nuclear plant operator (NPO) rounds, cold weather preparations and periodic self-assessments) continued to be identified late in the SALP period.

The Operations department demonstrated a weak understanding of the licensing and design basis of the plant. This weak understanding contributed to operation outside the licensing and design basis of the plant, such as the

July 1995 operation at reduced RCS pressure, without performing the required safety evaluations. Technical Specification (TS) inconsistencies also created obstacles and challenges to plant operations. Although management successfully addressed several emerging issues and planned future improvements to the TS, these inconsistencies resulted in the initiation of plant shutdowns and delays in repairing safety-related equipment.

The training department's exam preparation and evaluations of crew performance in the simulator were excellent. Good management involvement in training and initiatives were evident. While operator performance in the simulator was generally very good, it was not always reflected in plant performance as indicated by the aforementioned operator performance weaknesses.

In summary, while the operators were well poised to restart the plant in June 1995 and conservative decision-making was displayed by management during plant restart and power ascension, plant events in the latter half of 1995 and weaknesses in the material condition of the plant significantly challenged the operators. These events also demonstrated weaknesses in operator understanding of the licensing and design basis, questioning attitude and procedural adherence. The subsequent prolonged forced outage, beginning in September 1995 and ongoing at the close of the SALP period, forced the Operations organization in particular, and the plant organization in general, to react to emerging problems and delayed their focus on planned long-term performance improvements. As a result, performance declined following the RATI in April 1995. While significant corrective actions and management attention were devoted to improving operator performance late in the SALP period, evidence of sustained performance improvement remains to be demonstrated.

The Operations area is rated **Category 3.**

II. PERFORMANCE ANALYSIS - MAINTENANCE

The Readiness Assessment Team Inspection (RATI) in April 1995 focused considerable attention to this performance area and noted that routine maintenance and surveillance activities were conducted adequately and in accordance with station procedures. When problems occurred during an activity, the maintenance staff stopped work and contacted their supervision to resolve the problem before continuing. A strong supervisory oversight of field activities was observed. Good progress was made in improving the surveillance program, where previous performance weaknesses played a key role in necessitating the 1993-1995 Performance Improvement Outage. However, the RATI noted that some event evaluations were weak as were corrective actions taken for several repetitive maintenance deficiencies. Plant material condition for restart was good, the problem identification program was effective, and the maintenance backlog was acceptable and well prioritized.

During this period, performance in the maintenance area was good. Management oversight of maintenance activities was good with a strong emphasis on safe plant operation. Maintenance management and staff generally responded well to emergent equipment issues and displayed very conservative decision-making in addressing many of these issues. Good coordination was evident between

Maintenance and other plant departments such as Operations, Engineering and Security. When a degraded equipment condition was found, NYPA not only determined the root cause of the problem and fixed the specific component involved, but also broadened their review to determine if similar components were also degraded. Examples included the analysis of the 31 RHR pump seal leakage and the steam generator hand hole leakage in December 1995 as well as the containment fan cooler flange/piping corrosion in January 1996. However, weaknesses were noted in several root cause evaluations, resulting in the recurrence of performance problems such as the operation of the reactor flux mapping power supply switch while tagged and the spill of reactor coolant system (RCS) water during a pressurizer level calibration.

Good performance of maintenance activities in the field was noted and achieved, in part, because of the emphasis on procedure adherence and good supervisory oversight. Examples of well managed and conducted maintenance evolutions included the reactor vessel O-ring seal and 31 RHR pump replacement activities and the repair of the 31 RHR pump discharge valve. The maintenance staff was knowledgeable of their assigned tasks and received adequate training to conduct these tasks in a competent manner. However, work planning was not fully effective in ensuring that adequate instructions were available to perform work. This frequently led to inefficient work practices at a time when maintenance backlogs were increasing. While many of the existing maintenance procedures relied upon the skill-of-the-trade to successfully complete tasks, procedure improvements were routinely made, often during the conduct of maintenance, to enhance the level of detail provided in the procedures.

An effective surveillance program was in place prior to plant restart in June 1995. However, events over the SALP period revealed weaknesses in surveillance test procedures that were being addressed by NYPA at the end of the SALP period. For example, an inadvertent engineered safeguards actuation and an unexpected main turbine trip during testing were caused by surveillance procedures which did not provide adequate instructions for the plant conditions present. The loss of pressurizer heater control and inadvertent spill of reactor coolant during pressurizer level calibrations was also caused by an instrumentation and controls (I&C) procedure which was not adequately written for the plant conditions present. Furthermore, an inadvertent main turbine generator runback was caused by a personnel error by I&C personnel while restoring from a failed surveillance test. Although technicians normally adhered to procedures well, these events may have been prevented had the I&C technicians and supervisors displayed a better questioning attitude during the conduct of the procedures. As noted in the Operations section, the poor review of the adequacy of plant conditions for the release of work by Operations as well as the poor understanding by Operations of the impact of the conduct of the work was a related performance weakness that also contributed to these problems.

A generally effective program was established for the identification of material and equipment deficiencies, and items that required resolution prior to plant restart were appropriately designated as restart items. While the NRC noted a large number of minor material condition deficiencies in the last two months of the SALP period, NYPA was properly evaluating and prioritizing

these deficiencies. However, the increased number of equipment failures, particularly in the balance of plant, and material deficiencies identified in the latter part of the SALP period reflected the need for increased management attention to improving the material condition of the plant. NYPA's self-initiated review of multiple equipment failures since plant restart was a good initiative that identified the root and contributing causes for these failures. The effectiveness of planned corrective actions was yet to be realized at the close of the SALP period.

In summary, maintenance activities were generally well coordinated and the overall quality of the work performed was good. Procedure improvements were evident as was increased procedure adherence and a questioning attitude on the part of maintenance workers. Surveillance activities were generally conducted well and in accordance with procedures. However, occasional lapses in the questioning attitude of test personnel and in supervisory oversight caused several inadvertent and unexpected impacts on plant systems that resulted in challenges to the operators. Plant material condition declined since restart as evidenced by the growing maintenance backlog and the increased frequency and number of equipment failures, particularly in the balance of plant.

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

IV. PERFORMANCE ANALYSIS - ENGINEERING

The RATI found that the major engineering organizations were available to the plant and their support to the station was effective. Both the Design Engineering and the Technical Services organizations were controlling and adequately screening their backlogs. The team found both the permanent and temporary modification processes adequate and that safety evaluations contained adequate technical detail. The RATI found the material condition of the plant adequate to support restart, based on its review of conditions at the time of its inspection.

Since the RATI, material condition and other emergent problems continued to challenge the engineering organizations. Those organizations responded adequately to those challenges, but with significant impact to their long term program activities. As a result, the organizations' backlogs grew since the RATI and those backlogs, along with emergent issues, controlled the agenda of the engineering organizations.

Performance in areas receiving specifically-focused management attention, such as the motor-operated valve program, was good. Also, when important system concerns arose, such as in the case of water intrusion in the containment weld channel pressurization system and in reaction to service water valve deficiencies, focused attention by engineering management resulted in good performance. However, for routine activities and for activities not receiving specific management attention, performance varied significantly and was sometimes poor. For instance, the engineering organizations' initial response to the issue of the operation of the weld channel pressurization system at too high a pressure was poor. Further, the engineering organizations were not successful in making needed improvements in work prioritization and backlog controls, in setpoint controls and in configuration management. Also, poor

communications among the engineering and operating organizations resulted in a fragmented station approach to the identification and resolution of concerns associated with plant operations at low reactor coolant system pressure.

The quality, depth and technical detail of engineering activities also varied. Good performance was evident in the resolution of a large number of Appendix R fire issues, although initially, the resolution of emergency lighting issues was problematic. Also, Engineering provided timely support to the operating organization in reaction to emerging issues. Engineering provided timely support for operability determinations and for technical specification interpretations. Examples included activities associated with the response to a service water leak inside containment, with the evaluation of a failed safety injection logic relay and with the response to a hydrogen leak from the main generator. Also, the prompt design of a temporary nitrogen fill rig prevented decreasing safety injection accumulator pressure due to the primary fill valve becoming inoperable. Safety evaluations were generally of good quality. The Engineering Assurance program was a good initiative to enhance performance.

Weak technical performance was noted in incomplete engineering work in modification activities. Examples included: a modification authorizing the use of Belzona epoxy that did not limit or specify the repair scope; the modification to replace the emergency diesel generator lube oil check valves that did not address mounting brackets which did not support the replacement valves; the temporary modification to the sodium hydroxide tank heater that did not consider cable separation concerns; and the temporary modification for a backup instrument air system that did not specify the required cleanliness level of the temporary system. Also, technical quality weaknesses were evident from the number of change notices required to support modification activities.

Performance was good in activities such as motor-operated valve testing, design basis documentation, software quality assurance and drawing updating. However, minor weaknesses continued to exist in the completion of the back-end design change process, such as with document updates.

Emergent work, including material condition problems, severely impacted the ability of system engineering to provide attention to long-term system and equipment monitoring activities. System engineers and their managers understood the role of system engineers in monitoring system and equipment conditions and in maintaining equipment reliability. Further, system engineers provided aggressive and timely support to the operating organization, throughout the restart and subsequent operating period, in modification activities and in diagnostic and followup work associated with equipment problems. However, the system engineers did not have time to perform rigorous trend analyses and other condition monitoring activities that are needed to reduce the rate of occurrence of significant equipment failures. Station and corporate engineering management were aware of the problems, but have not yet addressed the situation effectively.

In summary, engineering performance was adequate overall during the assessment period. For issues that received specifically-focused site or engineering

management attention, performance was good. For other issues, performance varied significantly, with some noteworthy examples of poor work. Operability determinations, technical specification interpretations and the resolution of material condition problems were generally good. However, emergent work activities severely hampered the engineering organizations' ability to focus and address longer term issues that affect equipment reliability and organizational performance. Technical quality of work varied significantly. System engineering responded well to emerging issues, particularly equipment failures, but they and their management did not provide for those trending and other monitoring activities that are necessary to reduce the occurrence rate of significant equipment failures.

The Engineering area is rated **Category 3.**

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

The Plant Support functional area includes assessment of performance in the radiological protection, security, emergency preparedness, fire protection and housekeeping areas. The RATI did not focus on the first three areas since they did not contain performance problems. Extensive work occurred separate from the RATI in the fire protection area. Housekeeping was observed during a number of inspections and site visits by NRC management.

During this period, performance in the radiological protection area continued to be strong. The level of information available to workers through signs and postings and through the labelling of radioactive material was excellent. The Radiation Safety Committee maintained a broad perspective on radiation protection issues and contributed to successful performance in the area. Survey records and contamination controls were very good. ALARA performance was also very good. Initiatives to identify and correct weaknesses in the radiation protection program succeeded in improving the overall quality of the program and its implementation.

Performance in the security area improved over the period as a result of continued management attention and support. The program was implemented effectively as indicated by the few, low significance security events that occurred. Coordination of needs with the maintenance organization provided for prompt response to equipment problems and minimized the need for compensatory measures and guard force overtime. Security personnel were knowledgeable of their duties and responsibilities. The security organization responded effectively to a vehicle accident involving the protected area fence and to a loss of power to security equipment. A detailed NRC inspection of program effectiveness found few problems; management promptly addressed one subtle finding related to the intrusion detection system coverage.

Emergency preparedness performance remained good. Key positions in the emergency response organization (ERO) remained filled by well-qualified and trained individuals. Performance during the off-year exercise was very good. Operators promptly identified the degraded conditions, anticipated impending challenges and crafted mitigative strategies, properly classified the event and made the required notifications in a timely manner. Also, technical support center (TSC) and operations support center personnel (OSC) provided

good technical support to the operators and ERO managers. The engineering staff in the TSC provided good diagnosis of plant conditions and developed good repair strategies in conjunction with the OSC. In addition, the licensee effectively managed the transition to NUMARC Emergency Action Levels; this was especially significant since that transition occurred during the restart program. Also, operator response to a technical specification-required shutdown included an appropriate Unusual Event declaration.

NYPA's actions in the fire protection area were appropriate to resolve the issues that existed that impacted restart. Their efforts to gain and maintain control of the program were effective. Key to the licensee's success was the Fire Protection/Appendix R Task Force and the associated oversight committee. Symptom-based instructions used to achieve hot and cold shutdown were satisfactory. However, NYPA's approach to resolution of emergency lighting issues was initially weak.

General housekeeping conditions in the plant were mixed. Heavily traveled areas were well maintained but other areas were not. Containment closeout activities showed some weaknesses that suggested that expectations in the housekeeping area were either not developed or were ineffectively communicated to departmental staffs.

In summary, performance in the radiological area remained strong. In the security area, performance improved to the point where it was also strong. Further, the licensee maintained an effective emergency preparedness program. Significant efforts were expended in the fire protection area to make the area ready to support restart. Those efforts were generally good. Housekeeping performance was mixed, with some evidence that suggested that management expectations in that area either were not fully developed, or not clearly communicated.

The Plant Support area is rated **Category 1.**

ENCLOSURE 2

INDIAN POINT UNIT 3 PLANNED NRC INSPECTIONS

APRIL 1996 - APRIL 1997

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

PROCEDURE NUMBER	TITLE	DATE
82301 CO	EP Exercise for PWR	4/8/96
71707 RI	Plant Operations (Focus on the Operator Review and Release of Work and Surveillances Based on Weaknesses Noted in the Release of I&C Surveillances During Inappropriate Plant Conditions)	6/03/96
71701 CO	Licensed Operator Requalification	6/17/96
86750 CO	Solid Radwaste Management	6/24/96
37550 CO	Engineering Visit #1	7/29/96
84750 CO	Radwaste Treatment & Effluents	8/5/96
61725 RI	Surveillance Testing and Calibration Control Program (Focus on the Adequacy of I&C Procedures and Worker Performance During Testing Due to Problems with the Conduct of Tests Under Inappropriate Plant Conditions)	9/16/96
83750 CO	Occupational Radiation Exposure	9/30/96
73753 CO	Inservice Inspection	9/30/96

37700 RI	Design Changes and Modifications (Focus of System Engineering Performance, Role of the System Engineers and Trend Analysis due to SALP Board Concerns in These Areas)	10/7/96
TI 2515/126 SI	Performance of Online Maintenance (Conduct of TI Delayed Since the Plant was not in Operation when the TI was Previously Scheduled to be Conducted)	10/14/96
62700 RI	Maintenance Program Implementation (Focus on Rework and Recurrent Work, Work Controls and Maintenance Backlog Prioritization due to Poor Plant Material Condition)	11/25/96
40500 CO	Effectiveness of Licensee Controls in Identifying, Resolving and Preventing Problems (Focus on PORC Activities, Setpoint Controls, Post-Modification Testing and Configuration Management due to Performance Weaknesses in These Areas)	12/9/96
37001 RI	10 CFR 50.59 Safety Evaluation Program (Focus on Inspecting Procedures Against the FSAR Licensing Basis as well as Assessing Operator Understanding of the Licensing basis and Operability Requirements for Selected Safety Systems due to Performance Problems)	1/13/97
37550 CO	Engineering Visit #2	2/24/97
83750 CO	Occupational Radiation Exposure	3/01/97
TI 2515/109 SI	Temporary Instruction - MOV Program (Date TBD Based on Completion of MOV Effort as Documented via Letter to the NRC)	TBD