ENCLOSURE 1

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

REPORT NO. 50-247/95-99

I. BACKGROUND

The SALP Board convened on September 29, 1995, to assess the nuclear safety performance of the Indian Point Nuclear Generating Unit No. 2 for the period March 20, 1994, through September 16, 1995. The Board was conducted pursuant to NRC Management Directive (MD) 8.6 (see NRC administrative letter 93-20). Board members were Richard W. Cooper, II (Board Chairman), Director, Division of Reactor Projects, NRC Region I (RI), Charles W. Hehl, Director, Division of Radiation Safety and Safeguards, RI, Allen R. Blough, Acting Deputy 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 Operations area was rated Category 1 in the last SALP period. Corporate and site management demonstrated an excellent safety oriented philosophy, as evidenced by a conservative approach to plant operation. The operating staff's strong performance contributed to safe plant operation. While still rated superior, the overall level of performance declined slightly from the previous SALP period due to problems with communications, procedural adherence, and personnel errors that resulted in minor plant events.

During this assessment period, management involvement in plant operations and commitment to safety continued to ensure safe plant operation. The Station Nuclear Safety Committee (SNSC) and Nuclear Facilities Safety Committee (NFSC) independently reviewed station activities and industry experience for incorporation into Indian Point 2 plant activities. For example, the SNSC discussed lessons learned from other utilities that had extended operating cycles greater than 400 days that resulted in the implementation of several initiatives, including increased management oversight of operator performance and ultrasonic testing of piping systems to validate previous predictions of pipe wall thinning from erosion/corrosion. Plant and Operations Department management also exhibited a conservative operating philosophy, as illustrated by the step-wise power ascension and comprehensive leakage monitoring program following the identification of leakage in the 24 steam generator.

Management also took action to address weaknesses from the previous SALP period through the development and implementation, in the form of a continuous process, of the Operations department self assessment, which identified areas for improvement that included procedure adherence and use, communications, and control of activities. Operations department management also took action to improve personnel performance and preclude events. Such action included an

aggressive schedule for operations personnel benchmarking other utilities and acquiring outside training, supplementing operator logs to monitor service water pump parameters as a result of recurring failures of shaft couplings, and providing additional training to operators in preparation for the refueling outage to minimize the potential for affecting reactor coolant system boron concentrations.

Operators continued to perform in an exemplary manner when responding to abnormal events, plant transients, and major plant evolutions. Licensed operator training continued as a strength during this assessment period and was characterized by a program aimed at providing timely feedback of identified weaknesses, and detailed and comprehensive pre-evolution briefings for major plant activities. For example, the full system decontamination that was conducted during the refueling outage required extensive alteration of plant operating conditions and development of and training on temporary operating procedures. The extensive training and preparation resulted in this complex evolution being well controlled by operators.

Power operations were generally event free and characterized by good operator performance during this assessment period. However, weak adherence to procedures and personnel errors continued to result in minor plant events. For example, in the first half of the assessment period, a nitrogen purge manual valve was found mispositioned shut during a quarterly surveillance test, the motor circuit breaker for a fire pump was not racked in following the clearance of an associated tagout, and a surveillance test failed on the 24 service water pump when an operator did not close a blowdown valve on a strainer as called for in the procedure.

Periods of increased challenges, such as the extended and complex refueling outage, resulted in performance problems that caused significant adverse impact on plant systems and equipment. This performance was characterized by problems with the control of the configuration of plant equipment, and was exacerbated by weaknesses in procedure quality. Weak configuration control caused or contributed to an inadvertent decrease of 12,000 gallons in the water level of the Refueling Water Storage Tank (RWST), a large spill of contaminated water from the RWST into the Primary Auxiliary Building, an inadvertent boration of the reactor coolant pump seals during the reboration process following the full system decontamination, the implosion of the Condensate Storage Tank, and the overflow of the Diesel Fire Water Tank that resulted in an unplanned release of contaminated water offsite. Weaknesses in the adequacy of operating procedures also contributed to the latter two events. In addition, the use of an inadequate temporary procedure for filling and venting the Residual Heat Removal System from the draindown condition resulted in inadequate venting of the Safety Injection System pump, causing it to be damaged.

In summary, extensive and frequent management involvement continued to ensure safe plant operation over the assessment period. Independent committees were aggressive and used effectively in implementing a conservative operating philosophy. The Operations department was generally effective in developing and implementing actions to address weaknesses identified in the previous assessment period. However, weak adherence to procedures and personnel errors

continued to result in minor plant events. Periods of increased challenges, such as the extended and complex refueling outage, stressed the organization and resulted in events that caused significant adverse impacts to plant systems and equipment. Root causes of such events were weak configuration control and poor quality procedures.

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

III. PERFORMANCE ANALYSIS - MAINTENANCE

The Maintenance area was rated as Category 1 during the previous assessment period. Proactive and effective management involvement was evident. Strong program management and excellent self-assessment activities led to improved coordination and increased maintenance productivity, efficiency, and quality. Appropriate short-term action was taken to lower the threshold for identifying material deficiencies. Although some minor program weaknesses and isolated performance issues were noted, there was continued and demonstrated overall improvement in the maintenance area during the SALP period.

During this assessment period, the weaknesses noted in the last SALP related to the gage calibration program, the threshold for identifying material condition deficiencies, and procedural adherence deficiencies in the surveillance program, were resolved. Further, excellent overall maintenance performance contributed to the lack of equipment-based operational challenges to the operating crews. Also, maintenance aggressively supported operations in correcting emergent plant deficiencies as evidenced by the leak repair activity on the 21 main steam isolation valve, replacement of all four reactor coolant pump seals following the reactor coolant system decontamination, repair of the refueling conveyor car assembly, and repair of the three leaking service water valves. Communications with other departments at the site were a notable strength. The cleanliness of the facility and the good material condition of the equipment was noted during several inspections. The labeling of components and systems was also noteworthy.

Management involvement in and support of maintenance activities continued to be excellent. Examples included the continuation of the leak reduction program for the radiologically controlled area, development of piping and instrumentation drawings for the gas turbines, upgrading of the control systems for the gas turbines, and the review, for upgrading, of the maintenance and surveillance programs for the refueling equipment. A particularly noteworthy initiative was the motor operated valve lubrication degradation study conducted by Con Edison during the course of the last operating cycle, which led to additional margin being included in the stem thrust calculations. Also the Station Nuclear Safety Committee (SNSC) was proactive and effective in addressing maintenance activities as evidenced by its reviews of the on-line leak sealing of safety related components and the service water pump failures.

The maintenance work force was experienced and well trained. Good control of surveillance and post maintenance testing was observed. Observations of work in the field showed workers to be knowledgeable of requirements. Workers showed excellent initiative in identifying unexpected conditions encountered

during maintenance activities, and reporting them for evaluation and resolution. Examples included a mispositioned valve in the nitrogen purge line to the plant vent noble gas monitor, misaligned bolt holes on the control rod drive cooling fan supports, inadvertent autostart of a component cooling water pump during troubleshooting activities, and the 1/4" lift check valves with the flow arrow pointing in the wrong direction.

In contrast, there were some isolated lapses in personnel performance, such as the overflow of the diesel fire water storage tank, introduction of foreign material into the circulating water and service water bays, introduction of foreign material into the weld channel and containment pressurization system during a modification, and improper removal of a boric acid pump impeller. Also, problems were encountered in the control of maintenance work during the 1995 refueling outage. Several activities that were improperly performed and that adversely impacted facility operation included the improper installation of the turbine generator #1 bearing, incomplete welding of a moisture separator reheater drain line, improper adjustment of feedwater regulating valves' packing glands, and the improper installation of gaskets on three service water pump discharge isolation valves. These indicated that the work control problems, relating to the 1993 refueling outage, identified in the last SALP period had not been fully resolved, although the problems during the 1995 outage were predominantly in the area of non-safety related maintenance versus safety-related maintenance which was generally performed quite well.

In summary, strong management attention to the maintenance program continued. The programs for controlling the scheduling and performance of maintenance and surveillance testing continued to be effectively implemented. Excellent overall maintenance performance contributed to the lack of equipment-based operational challenges to the operating crews. Weaknesses identified in the last SALP concerning procedural adherence in the surveillance area, the gage calibration program, and the threshold for identifying material condition deficiencies were corrected. One weakness in the area of outage work control was not, as evidenced by maintenance problems during the 1995 refueling outage; however, unlike the last SALP period, the problems predominantly occurred during non-safety-related versus safety-related maintenance activities.

The Maintenance area is rated **Category 1.**

IV. PERFORMANCE ANALYSIS - ENGINEERING

In the previous SALP period, engineering was rated as Category 1. Engineering demonstrated strong support to the plant operating organization, particularly in evaluating emerging issues. The engineers and engineering management demonstrated good judgement, a thorough resolution of problems, and a sound safety perspective. The quality of the engineering work continued to be high. However, there were a few instances where engineers and engineering management were not rigorous in reviewing issues, and where corrective actions did not address the root causes.

During this assessment period, very strong engineering performance in most areas continued, yet some recurring or chronic issues indicated lapses in determining or addressing causes of technical problems.

Management oversight, involvement, and controls were comprehensive and effective. Direct engineering management involvement was usually evident in conservatively and effectively resolving safety issues at the plant. Management made good use of performance indicators and information reports. Considerable engineering management attention was focused on resolving safety issues. An effective prioritization enabled management to allocate resources wisely to reduce the engineering backlog. Engineering was actively engaged in self-assessment activities, such as the post-modification critiques. Corrective action programs were properly implemented and controlled. Communications between the site and corporate organizations were very good, but suffered occasional minor lapses.

The quality of technical work was usually excellent. Permanent design changes and plant modifications were of high quality. The licensee's administrative procedures included sufficient details to ensure that the intended plant changes were designed and implemented in a safe and controlled manner. The licensee's design modification packages were typically of good quality, the safety evaluations were thorough and complete, and the post-modification test requirements were clearly defined. Modifications were accomplished that improved plant safety; for example, the steam generator nozzle dam installation not only reduced worker radiation exposure, but also substantially reduced the period of reduced coolant inventory needed to complete outage activities. The temporary design changes and plant modifications were of high quality and properly controlled. The supporting calculations for instrument setpoint changes were clear and easy to follow. The guidelines for properly controlling determinations of equivalency and material substitution authorizations were clear, and the change packages were thorough and technically sound.

Although operability evaluations, root cause determinations, and corrective actions were usually thorough and technically sound, there were significant exceptions. Limited actions was taken over several years to address Residual Heat Removal (RHR) system water hammer susceptibility. Also, there were recurrent problems with safety injection pump fasteners and recurrent mechanical failures of service water pumps. These represent lapses in the rigor of conducting technical investigations, determining root causes, and addressing these causes; the NRC made similar comments in the last SALP.

Engineering programs, such as those involving steam generator inspections, motor-operated valves (MOV), and seismic qualification evaluations, were strong and well-coordinated. The MOV program was particularly noteworthy and made excellent use of dynamic valve tests.

The licensee maintained a well-qualified engineering staff and an excellent training program. Engineering staff demonstrated very good knowledge in their areas of responsibility. The safety responsibilities among engineering sections were well-defined, and the engineering organization was well focused on providing support to the plant operating organization.

In summary, overall engineering performance was superior. Strong management involvement contributed to effective resolution of most issues and good work prioritization. Technical work was usually excellent, and modifications were well-controlled and focused at improving plant safety. However, some recurrent or chronic problems indicated lapses in determining or addressing their causes. Engineering programs were effective, and the MOV program was particularly strong. The engineering staff was well-trained and knowledgeable.

The Engineering area is rated as **Category 1**.

V. PERFORMANCE ANALYSIS - PLANT SUPPORT

The plant support functional area covers activities related to plant support functions, including radiological controls, emergency preparedness, security, chemistry, fire protection, and housekeeping controls.

In the previous SALP the plant support functional area was rated as Category 2. Performance in the radiological controls area was good. Strengths were noted in the implementation of an aggressive As Low As Reasonably Achievable (ALARA) program, and in the radwaste processing and shipping program. However, poor radiological housekeeping and adherence to work practice standards were also noted. The radiological effluent monitoring and effluent control programs continued to be effective. In the emergency preparedness area, good management support and oversight were evident in the improved training program and response facilities. Security program performance continued to be good, and several enhancements were noted. Fire protection area performance was not specifically evaluated.

During this assessment period, the radiation protection program continued to be effectively implemented. Management support for ALARA was evidenced by aggressive and innovative approaches to reducing the radiological hazards through source term reduction and other ALARA initiatives. Superior progress was made in reducing personnel exposure rates through successful implementation of a full reactor coolant system chemical decontamination. The system decontamination, combined with effective implementation of radiological controls, resulted in effectively halving the dose for the Spring 1995 outage. The radiation protection program support areas of instrumentation, dosimetry and respiratory protection were effective. The radiation protection training program was of good quality. However, a significant negative performance issue, regarding access to high radiation areas and worker adherence to procedural controls, continued into the latter part of the assessment period. The radioactive waste processing and transportation program performance was generally strong; however, the control of shipment packaging was not entirely effective as evidenced by a shipment that exceeded radiation limits. Audits and surveillances of the radiation protection program were effectively used to improve program performance. Housekeeping in radiologically controlled areas was generally good during this period, and, overall, plant housekeeping and material condition were excellent.

Implementation of the radiological environmental monitoring and effluent control programs continued to be excellent. Liquid and gaseous effluent

programs were effectively implemented. The meteorological monitoring program was a strength. Significant improvement was noted in radiation monitoring system calibrations and several system upgrades were implemented. Audits and surveillances were performance based, and of sufficient scope and depth to effectively evaluate program performance. The effectiveness of the laboratory Quality Assurance/Quality Control program was demonstrated by good agreement between split samples analyzed by the licensee and the NRC.

Good emergency preparedness program performance was noted during drills and exercises. During the June 1994 full-participation exercise, command and control activities were strong throughout the emergency response organization. Emergency class declarations, protective action recommendations, and offsite notifications were accurate and timely. Emergency response facilities were maintained in a good state of readiness. The licensee upgraded the emergency communications system lines, the Alternate Emergency Operations Facility, and the Emergency News Center. However, exercise problems were identified with the electrical expertise support to the Technical Support Center and with in-plant communications.

The licensee continued to implement a generally effective security program. Management attention to and involvement in security matters continued at a high level, as evidenced by an extremely effective intrusion detection system and proactive initiatives that significantly reduced vital area door events. Security preparations for a public demonstration reflected good planning, communications, offsite support, and management involvement. However, several long-standing problems with assessment aids were not resolved. This weakness was particularly evident during the Operational Safeguards Response Evaluation (OSRE) conducted during the period. The OSRE also highlighted other areas of poor performance in response planning and strategy, and contingency response training. Although these performance weaknesses have been resolved, resolution of these weaknesses was not timely.

The fire protection program was a strength. Fire protection equipment was effectively maintained and fire brigade members were well trained, as evidenced by strong performance during drills and in actual response to a fire.

In summary, the plant support functions effectively contributed to safe plant performance. Performance in the radiation protection area continued to be effective. Superior progress was made in reducing the in-plant exposures through aggressive dose reduction activities. However, there were continuing problems with high radiation area access controls and worker adherence to radiological procedures. Excellent performance in the radiological effluent and environmental monitoring programs was noted. Performance in the emergency preparedness area continued to be very good. Security program performance was generally good, however several longstanding assessment aid problems went unresolved, and significant performance issues were identified during the OSRE. Plant housekeeping and material condition were excellent.

The Plant Support area is rated as **Category 2.**

ENCLOSURE 2

INDIAN POINT UNIT 2 PLANNED NRC INSPECTIONS

OCTOBER 1995 - OCTOBER 1996

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

PROCEDURE NUMBER	TITLE	DATE
RI 82301	Evaluation of Exercises for Power Reactors (Evaluation of off year exercise)	11/15/95
RI 82302	Review of Exercise Objectives and Scenarios for Power Reactors (Evaluation of off year exercise)	11/15/95
RI 40500	Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems (Evaluate self-assessment effectiveness as it applies to Human Performance issues, focusing on operations area; several configuration control, procedural adequacy and procedural adherence problems noted)	1/8/96
CO 81700	Physical Security Program - Visit 1	1/16/86
CO 84750	Radioactive Waste Treatment and Effluent and Environmental Monitoring - Environmental Monitoring	3/11/96
RI 93801	SSFI type review - Control Room Ventilation (Inspection to evaluate operation, testing and maintenance of system; problems identified at similar facility)	4/1/96
CO 86750	Solid Radioactive Waste Management & Transportation of Radioactive Materials	4/8/96
RI 83726	Control of Radioactive Material and Contamination, Surveys, and Monitoring (Several high radiation areas violations)	5/13/96
CO 37550	Engineering - Visit 1	5/13/96
CO 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring - Effluents	7/8/96
CO 83750	Occupational Radiation Exposure	8/12/96

CO 64704	Fire Protection Program	9/1/96
CO 93808	Integrated Performance Assessment Process (IPAP)	9/9/96
CO 71001	Licensed Operator Requalification Program	9/16/96