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October 12, 1989

Re: Indian Point Unit No. 2
Docket No. 50-247

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

SUBJECT: 45-day Response to NRC Inspection Report 50-247/89-80,
Maintenance Team Inspection

This is in response to your letter dated August 21, 1989 concerning the special maintenance team inspection No. 50-247/89-80 led by Mr. Leonard Prividy from April 24 to May 5, and May 22 to May 26, 1989. We were requested to respond within 45 days of receipt of your letter to the weaknesses identified in the Inspection Report and to address the actions taken and planned in response to the recommendations of the 1987 Maintenance Self-assessment. We have completed our review of the Inspection Report and provide the following response.

It is clearly recognized that opportunities exist for improvement in our maintenance process. These opportunities had been recognized in our own Maintenance Self-assessment and numerous corrective actions are under way. The Maintenance Self-assessment document was provided to the team during the inspection. It assessed sixteen areas and made significant recommendations in eight of those areas. In addition, recommendations identified in the Third Party Review also relate to maintenance issues and are being addressed.

We believe that our corrective actions, taken and planned, resulting from the Maintenance Self-assessment, the Third Party Review, and other initiatives substantially address the items identified in Appendix 3 of the Inspection Report. These corrective actions are detailed in Attachment 1 as our Action Plan. For completeness, we are also providing, as Attachment 2, a matrix that relates our Action Plan to the weaknesses identified in the Inspection Report.

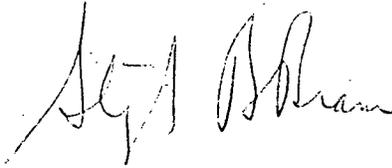
As discussed with your staff at a meeting on September 28, 1989, we believe that we have a number of initiatives under way or planned that will result in significant improvements in the maintenance process. Our equipment performance, as indicated by trip rate and thermal performance, has been steadily improving. We view this as indication of an improving maintenance trend. The initiatives described herein will ensure that this trend continues and that lasting improvements are made.

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Should you or your staff have any questions, please contact Mr. Jude G. Del Percio, Manager, Nuclear Safety and Licensing.

Very truly yours,



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ATTACHMENT 1

MAINTENANCE PROCESS

ACTION PLAN

CONSOLIDATED EDISON COMPANY OF NEW YORK
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
OCTOBER, 1989

1.0 IMPROVEMENT PROGRAMS

A number of improvement programs have been initiated within the last year and one-half. These include the System Engineer program, the Design Basis Documentation project, a Procurement Review Task Force, the Station Enhancement Program, and the corrective action tracking program. Several of the programs directly related to maintenance inspection concerns are discussed below. These programs are indicative of our commitment to improve all maintenance activities.

1.1 Station Enhancement Program

An 'Enhancement Program' was undertaken in 1988 to accomplish various specific goals designed as a whole to improve the station, reduce backlog of maintenance work, reduce temporary modifications (jumpers), and generally improve the material condition of the plant. Some specific initiatives within this program included service water hanger improvements, lubrication program revision, wet steam piping inspection/replacement, radiation monitoring system improvements, and maintenance work order backlog reduction. This program was very successful in meeting its direct goals such as the reduction of jumpers from 60 to 7, repairs to numerous service water system hangers and replacement and upgrading of heat trace circuits and controls for service water.

1.2 System Engineer Program

The System Engineer program was instituted in July, 1988 and is being augmented with additional personnel. In regard to maintenance, the system engineers identify problems with systems and initiate appropriate corrective actions, evaluate system performance to improve efficiency and reliability, investigate events and perform root cause determinations, provide technical support for maintenance activities including work package preparation and post maintenance tests, track the performance history of their systems, and provide technical input in developing or revising maintenance procedures.

2.0 ACTION PLAN

2.1 Introduction

The planned changes to our maintenance process are intended to improve overall conduct of maintenance by implementing corrective actions derived from self-assessments and instilling in plant personnel the importance of maintenance. These changes will be accomplished through two basic paths, Maintenance Improvement Initiatives and Third Party Review Recommendation Implementation.

2.2 Maintenance Improvement Initiatives

The Maintenance Improvement Initiatives cover three areas:

- o Establishment of a 'Quality Maintenance Culture'
- o Maintenance Self-assessment Implementation
- o Backlog Reduction

2.2.1 Quality Maintenance Culture

The intent of this program is to instill a mindset in plant personnel to perform high quality maintenance. Maintenance is not just the responsibility of the Maintenance section. Rather, other sections and departments have maintenance responsibilities and each organization and individual must strive for the betterment of the plant, no matter how small the contribution to the effort. The key elements in this initiative as currently envisioned are discussed below. Additional elements may be added or existing elements revised as the effort matures.

2.2.1.1 Report on Maintenance

A report on maintenance will be provided to each station employee. This report will state our commitment to a quality maintenance process and provide goals and goal status to illuminate our progress. The first report will be issued by year end 1989 and will be updated periodically after initial issue.

2.2.1.2 Management Visibility in Maintenance

To demonstrate management's commitment to maintenance, the Vice President of Nuclear Power, the General Manager of Nuclear Power Generation, and the General Manager of Technical Services are conducting field visits aimed at reviewing work in-process, including planning and testing functions. These will serve to show by example that maintenance is everyone's concern. Also, by witnessing the process, management will better understand the barriers to effective maintenance and be able to remove those barriers. This will give further incentive to plant personnel to strive for a 'Quality Maintenance Culture'.

2.2.1.3 Supervisory Meetings

The Vice President of Nuclear Power, the General Manager of Nuclear Power Generation, and the General Manager of Technical Services will meet periodically with supervisors in an effort to improve communications between various levels of management, to identify and resolve barriers to efficient work performance, and to communicate standards. These meetings have already been conducted in Maintenance, will be held on a periodic basis and will be rotated between organizations.

2.2.1.4 Promotion of Maintenance

To help create and maintain awareness by plant personnel of the importance of maintenance and the need for their participation, an employee involvement program is being developed. This program is being modeled after our successful Target Safety Program and the Louisiana Power and Light 'Zero Deviation' program. This promotion is aimed at improving teamwork in maintenance activities and maintaining the need for quality maintenance at the forefront. This program will be in place by year end 1989.

2.2.1.5 Maintenance Quality Improvement Program

The Maintenance Quality Improvement Program is a joint effort by the Maintenance, Projects and Planning, and Quality Assurance sections to identify, quantify, catalog and resolve priority concerns with the goal to improve the quality and productivity of maintenance work. The intent is to openly and freely bring concerns and issues to the table so that we may understand our processes, resolve general issues and strengthen our performance. Individuals should gain an increased awareness of their responsibilities and be able to strengthen their performance and contributions to our success.

Surveillance techniques are being employed with feedback to the parties involved. A specific work activity is being reviewed each week, and approximately 5 jobs have been reviewed to date. We will continue this program until we see no further benefit. The frequency of surveillance activities may vary depending on program and plant status.

2.2.2 Maintenance Self-assessment Implementation

The 1987 Maintenance Self-assessment generated recommendations in eight areas of concern. Improvements have already been made in some of those areas. For those remaining, our planned corrective actions are derived from the self-assessment but may not be the specific recommendation. It has been determined that one area of concern is a low priority and no corrective actions are planned at this time. The eight areas and the status of the corrective actions are discussed below:

2.2.2.1 Maintenance Management Improvements

The Maintenance Self-assessment noted a need for a central administrative document describing how maintenance is performed.

A Station Administrative Order (SAO) has been issued that describes the maintenance process at Indian Point. This document (SAO-251, 'Conduct of Maintenance') integrates all of the various documents that deal with maintenance activities into a central administrative document. It defines the organizations and responsibilities of those sections involved in maintenance.

This SAO was in draft form at the time of the inspection, has since been issued, and will be further revised as changes are identified. It should be noted that due to the complexity of maintenance activities, individual procedures, policies and directives will remain in all areas of maintenance and maintenance support. This SAO is meant as an overall policy document. This item is considered complete.

2.2.2.2 Preventive Maintenance (PM) Program

The Maintenance Self-assessment identified a need to centralize, validate and coordinate the station PM program.

A central administrative document (SAO-250, 'Indian Point Preventive Maintenance Program') that identifies the elements of the PM program has been issued and is being implemented. This document integrates the various existing PM programs under a single control. It also establishes and implements a policy for scheduling PM activities and establishes responsibilities for various steps of the program.

The Master Preventive Maintenance Equipment List (MPMEL) is being updated and should be completed by the end of the first quarter of 1990. This list will consolidate all lists currently maintained by various station sections.

System engineers are reviewing the scope and frequency of PM activities to verify vendor recommendations are met or deviations justified. The MPMEL will be revised as necessary.

A comparison between the MPMEL, the station Q-List and system engineer recommendations will be conducted to ensure complete coverage of station equipment.

A station PM Coordinator has been selected and he will be tasked with leading this effort. This individual will be in place in November, 1989. The validation and revisions to the PM program will continue through 1990.

2.2.2.3 Maintenance Procedures

The Maintenance Self-assessment identified a need for better maintenance procedures which would be easier to use and which are more comprehensive.

A Maintenance Procedure Writer's Guide has been issued and a Maintenance procedure upgrade program has been implemented. This project involves the writing of several hundred Maintenance procedures over a number of years. Approximately 40 procedures will be completed by year end 1989. This effort will continue in 1990. Additionally, existing procedures are being redrafted in accordance with the new Writer's Guide when they are revised.

2.2.2.4 Maintenance Facilities

The Maintenance Self-assessment identified a need for improvements in the facilities devoted to maintenance and maintenance support.

A master facilities improvement plan is being developed. An architect has been retained and preliminary design steps are now being undertaken. The plan is aimed at integrating maintenance and maintenance support activities in an efficient manner in the Unit 1 turbine hall. In addition, a Class A staging facility is planned to be constructed onsite to improve our control of material and equipment. The staging area should be completed by October, 1990. The demolition to support the new facilities in the Unit 1 turbine hall is essentially complete. Construction of the slab to support the facilities is targeted for calendar year 1990, with facilities improvements (offices and shops) being implemented in calendar year 1991 and beyond. As our schedule for these facilities matures we will so inform the NRC resident inspectors.

2.2.2.5 Failure/Root Cause Analysis

The Maintenance Self-assessment identified a need for more root cause/failure analysis.

The Failure Analysis Group within Technical Services is being expanded to include two additional engineers and a goal has been set to significantly increase the number of failure analysis reports written as compared to a year ago. Root cause training has been conducted in-house for additional engineers. This training included the Human Performance Evaluation System (HPES) which involves MORT type techniques. The station also subscribes to NPRDS and regularly obtains CFAR (Component Failure Analysis Report) data which tracks component failures on approximately 230 component identifiers, involving approximately 5000 Indian Point 2 items, and compares station failure rates to industry norms and identifies deviations.

Additionally, since significant occurrence reports are prepared for various station events, including deratings and major equipment problems, this data is being trended and information on this forwarded to the system engineers and the maintenance and planning organizations. The Failure Analysis Group reviews this data and selects significant and repetitive failures for root cause determination and makes recommendations for corrective action when necessary. Such recommendations may include engineering modifications, test or procedural changes or maintenance method improvements or revisions. The need for more information from the maintenance crew to the engineering section has been identified. Revisions to the work implementation procedures will be made as necessary to improve this communication. Training will also be given to maintenance supervisors regarding NPRDS, CFAR and Failure Analysis Group capabilities. Procedural revisions and training will be completed by December, 1989.

2.2.2.6 Modification Planning and Implementation

The Maintenance Self-assessment identified the modification process as complicated and time consuming.

The current modification process has been updated significantly since the Maintenance Self-assessment and the Maintenance Inspection. Changes include the following:

- o implementation of a generic modification process;
- o implementation of a minor modification process;
- o implementation of a Determination of Equivalency process (for replacement of components with similar components);
- o Central Engineering responsibilities have been consolidated by realigning and reorganizing engineering sections responsible for Indian Point 2 under one individual. Field Engineering, Project Engineering, a modification scheduling group and the facilities group (small capital projects) now report to this individual;
- o the System Engineer program has been implemented and is currently being upgraded with the addition of new engineers;
- o a modification control system has been developed that utilizes the Indian Point Probabilistic Safety Study to set priorities.

We consider this item to be complete at this time although changes and improvements to our process will be made as the need arises.

2.2.2.7 Procurement

The Maintenance Self-assessment identified difficulties in procuring safety-related parts and equipment.

A materials organization reporting to the Vice President, Nuclear Power has been formed to incorporate procurement engineering and purchasing into a materials control group under one manager. The goal is to simplify many of the interfaces which create barriers to procurement. The procurement engineering function is being enlarged from one individual to three and the work which had been previously contracted out is being brought in-house. Two permanent Con Edison employees are now on-board and a third vacancy will be filled within approximately two months.

The procurement organization will be involved in developing the Master Parts list and linking this list with our computerized work order, planning and material ordering systems. A wide spectrum of procurement upgrades are planned as part of this program. The objectives are to optimize control of the procurement process, improve timeliness and availability of parts and materials, reduce cost of replacement parts, reduce carrying cost of inventory, reduce number and amount of inventory, optimize availability of spares in stock, and reduce the corrective maintenance backlog.

The procurement program is a multi-year effort. As schedules are further developed and finalized they will be discussed with the NRC resident inspectors.

2.2.2.8 Measuring and Test Equipment Control

The Maintenance Self-assessment recommended that the various measuring and test equipment control programs be consolidated under one organization.

SAO-217, 'Calibration and Control of Operational Equipment, Health Physics Instrumentation, and Measuring and Test Equipment', has been revised to clarify the equipment calibration intervals, the responsibilities for certain instruments and the definitions used. Although a centralized program may be more desirable, the individual programs do effectively control the use and calibration of measuring and test equipment. Based on this, and because of the need to utilize finite resources for the other initiatives, we do not plan to combine or modify the existing programs at this time.

2.2.3 Backlog Reduction

We will continue to strive to reduce the work order backlog. This will be accomplished by

- o supplementing the Maintenance work force with mechanics from another Con Edison division and through hiring of additional personnel;
- o increasing productivity and freeing resources by improving the work process through the Maintenance Quality Improvement Program (Section 2.2.1.5) and by improvements to the PM program (Section 2.2.2.2);
- o reduction of material holds due to lack of parts by improving the procurement of parts (Section 2.2.2.7);
- o assigning high priority to engineering requests to resolve work orders on 'Engineering hold' due to a need to evaluate the replacement of a component with other than an exact replacement. This effort has been ongoing and will continue.

2.3 Third Party Review Recommendation Implementation

An independent consultant performed a 'third party' review of the Con Edison safety philosophy and engineering program in support of Indian Point 2 from September, 1988 to January, 1989. The recommendations that resulted from this review affected modification engineering, organization of engineering support, staffing, long-term planning and engineering assurance. The Third Party Review Recommendation Implementation, as related to maintenance, consists of four parts:

- o Engineering Support for Long-term Material Problems
- o Maintenance Section Staffing
- o Control of Excluded Materials
- o System Engineer Program Improvements

2.3.1 Engineering Support for Long-term Material Problems

It was recommended that maintenance enlist additional engineering support in developing long-term solutions to material problems.

A staffing study, conducted by personnel from Power Generation Services, was begun in March of 1989 and was recently completed. The study had several purposes, including a review of system engineer responsibilities, a determination of the manpower needed to fulfill those responsibilities, the identification of engineers (beyond

system engineers) needed to support all maintenance functions, a normalization of the level of supervisory and craft personnel to meet known maintenance work loads, and an evaluation of the types and number of people needed to implement the goals of the assessments.

As a result of the study, additional staffing is being added. The number of system engineers will increase to 21. Engineering expertise is being added to the maintenance organization. The mechanic work force is being enlarged through staff additions. The Maintenance Quality Improvement Program described in Section 2.2.1.5 will also precipitate simplifications which will result in productivity improvements. A number of new foremen have been assigned to complement the experienced personnel already assigned. Lastly, the position of PM Coordinator has been created.

2.3.2 Maintenance Section Staffing

The review recommended a review of Maintenance section staffing.

The response to Section 2.3.1 is applicable to this recommendation.

2.3.3 Control of Excluded Materials

The review recommended that we consider, along with other planned procurement and spare parts program improvements, control of excluded and/or restricted equipment and materials.

Control of equipment and non-consumable materials that are undesirable for some uses in the plant will be included in the upgrade of the procurement methods. This effort is discussed in section 2.2.2.7.

2.3.4 System Engineer Program Improvements

The review recommended that we increase the system engineer staffing.

The response to section 2.3.1 is applicable to this recommendation. Staffing is being increased to 21 engineers.

3.0 CONCLUSION/SUMMARY

The action plan presented above represents our efforts to improve on our maintenance process. It is our intention to implement these improvements in a deliberate and planned manner. Since our maintenance process is evolutionary and dynamic, it will be necessary to periodically review and adjust the plans, as appropriate, based on circumstances. We will inform you of any changes made.

We have not specifically addressed each weakness identified in the inspection in our response. However, we have provided, as Attachment 2, a matrix that correlates each NRC-identified weakness with the corresponding section of this response which is related to the item.

ATTACHMENT 2

CONSOLIDATED EDISON COMPANY OF NEW YORK
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
OCTOBER, 1989

ATTACHMENT 2

| APPENDIX 3 ITEM NO. | MAINTENANCE IMPROVEMENT INITIATIVE | THIRD PARTY REVIEW | OTHER |
|---|--|-------------------------|-------|
| 1. The general material conditions of the plant and the plant housekeeping were considered to be poor. | 2.2.1 2.2.3 | | |
| 2. Lack of offsite and onsite management support and attention to conduct maintenance adequately and effectively. This general weakness is supported by the following specific weaknesses: | | | |
| a. Lack of management commitment to aggressively define and implement an effective maintenance program. | ALL | ALL | |
| b. Lack of an overall program document describing the conduct of maintenance. | 2.2.2.1 | | |
| c. The current status of the IP-2 maintenance organization is fragmented, not well coordinated, and incomplete in its assignment of certain tasks such as the systematic incorporation of vendor recommendations in the PM program. | 2.2.2.1 2.2.2.2 | | |
| d. The lack of a systematic method at IP-2 for defining equipment maintenance requirements (containment hydrogen sampler, high range radiation monitor and Westronics recorders) for inclusion in the preventive maintenance program. | 2.2.2.2 | | |
| e. Low allocation of resources needed to conduct maintenance effectively. | 2.2.1.5 | 2.3.1 2.3.2 2.3.4 | |
| f. Lack of management support to implement the corrective actions from the licensee's maintenance self-assessment. | 2.2.2 | | |
| g. Lack of management attention in the field to measure maintenance performance. | 2.2.1 | | |

ATTACHMENT 2

| APPENDIX 3 ITEM NO. | MAINTENANCE IMPROVEMENT INITIATIVE | THIRD PARTY REVIEW | OTHER |
|--|--|-------------------------|--------|
| h. Current span of control for system engineers is too broad which limits their effectiveness in the maintenance process. | | 2.3.4 | |
| i. Lack of adequate resources allocated for engineering support of the plant maintenance program. | | 2.3.1 2.3.4 | |
| j. Oversight by HP management of HPTs was inadequate to identify and correct improper radiological control work practices. | 2.2.1 | | Note 1 |
| k. The maintenance planner's workload is extensive, often extending some planning activities into the working phase. | 2.2.1.5 2.2.2.1 | 2.3.1 | |
| l. Work order backlog control was considered to be weak due to the combined impact of various deficiencies within the IP-2 maintenance program. | 2.2.2.1 2.2.2.2 2.2.3 | 2.3.2 2.3.4 | |
| m. Lack of timely and effective resolution of work orders. | 2.2.2.5 2.2.3 | 2.3.1 2.3.2 2.3.4 | |
| n. The lack of a central location for the machine shop, I&C work, and maintenance office areas makes supervision difficult. | 2.2.2.4 | | |
| 3. The licensee's I&C maintenance program is weak in that it lacks a formalized, well documented basis for calibration procedures which has resulted in uncertainty about the adequacy of certain calibration acceptance criteria. | | | Note 2 |
| 4. The QA/QC involvement in certain work items was weak or not timely, leading to the conclusion that the QA/QC style was basically reactive and not aggressive. | 2.2.1.5 | | Note 3 |

ATTACHMENT 2

| APPENDIX 3 ITEM NO. | MAINTENANCE IMPROVEMENT INITIATIVE | THIRD PARTY REVIEW | OTHER |
|--|--|-----------------------|--------|
| 5. HP support was insufficient to ensure compliance with licensee procedures concerning proper radiological control work practices. | | | Note 1 |
| 6. The lack of proper radiological control work practices by maintenance personnel, particularly for contractor maintenance workers. | | | Note 1 |
| 7. Weak communication existed between HP technicians and maintenance workers. | 2.2.1.5 | | Note 1 |
| 8. Some maintenance procedures are written such that work instructions do not reflect actual working conditions. Maintenance personnel were reluctant to closely adhere to such procedures. | 2.2.1.5 2.2.2.1 2.2.2.3 | | |
| 9. Lack of detailed review of certain contractor maintenance qualification documentation. | 2.2.2.1 | | Note 4 |
| 10. While PPMIS was considered to be a strength, it needs further development to facilitate trending of maintenance and component failures. There was no component level trending program. | 2.2.2.5 | | |
| 11. Vendor manuals have not been thoroughly reviewed to ensure that plant procedures are current with the vendor information. | 2.2.2.2 | 2.3.4 | |
| 12. Critical assessment of control of contracted maintenance is needed to ensure that other problems aren't being introduced by contractors which compromise safety and outweigh the benefits of the use of contractors. | 2.2.2.1 | | |

ATTACHMENT 2

APPENDIX 3 ITEM NO.

MAINTENANCE
IMPROVEMENT
INITIATIVE

THIRD PARTY
REVIEW

OTHER

-
13. Inefficient spare parts control which does not readily identify spare parts needs or assure adequate stocking levels.
14. Lack of complete documentation of training for mechanical and electrical maintenance workers.

2.2.2.7

Note 5

ATTACHMENT 2

NOTES

1. The four items are symptomatic of a common issue - failure by a worker to adhere to established procedures. Responsibility for ensuring compliance with plant procedures lies with the worker and first line supervisor. Immediate corrective actions for the occurrences supporting the items were documented with Radiological Occurrence Reports and individual disciplinary action was taken as appropriate. Longer term remedial action consists of assuring adherence to plant policies. By Station Administrative Order, first line supervisors are responsible for compliance to procedures by their subordinates regardless of the scope of the procedure. Additional instruction will be provided to supervising personnel to reinforce this responsibility.

Surveillance of compliance with plant policy in the area of health physics rests with the Technical Services Department. By procedure this Section has the responsibility to conduct periodic surveillance/compliance of the Radiological Controlled Area and to document any unsatisfactory radiological conditions or practices relative to radiological safety.

Heightened sensitivity and awareness on the part of personnel and their supervisors directly involved in daily activities as well as those charged with surveillance is warranted. The additional intra-departmental training referred to above is intended to achieve this objective.

2. The need to provide better documentation for the bases of I&C calibration procedures is being reviewed at this time. A determination will be complete by December 31, 1989 and our response to this item will be provided at that time.
3. The station QA/QC program is undergoing review at this time. This review includes consideration of the issues discussed in the Inspection Report. The review and plans for changes to the program that relate to the issues in the Inspection Report will be complete and reported to you by December 31, 1989.
4. SAO-504, "Qualification Of Contractors", to be issued by December 31, 1989.
5. The instances of incomplete documentation identified in the inspection will be updated by October 31, 1989.

Provisions will be developed by December 31, 1989 to ensure documentation is maintained current.