EDO Principal Correspondence Control

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TO:

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FOR SIGNATURE OF : ** GRN ** CRC NO:

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DESC:

2.206 -- Petition for Emergency Enforcement Action with Regard to Systemic Mismanagement and Lack of Compliance with NRC at Indian Point 2

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CITIZENS AWARENESS NETWORK

December 4, 2000

Mr. William Travers
Executive Director of Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555

PETITION FOR EMERGENCY ENFORCEMENT ACTION (10 CFR 2.206) WITH REGARD TO SYSTEMIC MISMANAGEMENT AND LACK OF COMPLIANCE WITH NUCLEAR REGULATORY REGULATION AT INDIAN POINT 2

I INTRODUCTION

In the interest of public health and safety, Citizens Awareness Network (CAN), Public Citizen, Westchester Peoples Action Coalition (WESPAC), Nuclear Information and Resource Service (NIRS), and Environmental Advocates petition the staff of the Nuclear Regulatory Commission to revoke the license of Con Edison to operate the Indian Point 2 nuclear power station due to systemic mismanagement. Con Edison, the owner of Indian Point Units 1 and 2, has compromised the health and safety of workers and the public. Although Con Edison made legal commitments to comply with NRC regulations, the utility has operated in flagrant disregard of NRC regulations. If it is determined that the root causes of Con Edison's mismanagement is deliberate management policy, we request that Con Edison's license to operate be revoked.

The breakdown in Con Edison's management is clearly illustrated through the inconsistencies and inaccuracies in the Final Safety Analysis Report (FSAR). The FSAR is a fundamental document essential for safe reactor operation. The NRC staff failed to enforce NRC regulatory requirements in regards to an updated and accurate FSAR for Indian Point Unit 2 thereby allowing Con Edison to operate the reactor out of compliance with its technical specifications.

Recent NRC action has been aggressive but remains reactive rather than proactive to immediate, large-scale problems. Con Edison in response to staff's requests is replacing its steam generators. However, the licensee's problems extend far beyond degraded steam generators and Con Ed's response is insufficient since it does not address systemic mismanagement by Con Edison management. It does not address the root causes, but attempts to "fix" the superficial aspects of the problem so that the licensee can sell the reactor without addressing the systemic mismanagement problems that will plague any new owner. NRC must initiate a full-scale independent analysis of all reactor systems. Since present deficiencies are an indicator of potential widespread mismanagement compromising safe reactor operation, the root causes of this systemic mismanagement must be determined. The undocumented inaccuracies and problems have occurred

over decades making it difficult to verify system compliance. In effect, the replacement of the steam generators is a "work around" so that the licensee does not have to undertake a comprehensive reorganization of its management systems and its reactor design basis documentation, analyses, and UFSAR.

II REQUESTED ACTION

1.) The Petitioners specifically request that the licensee, Con Edison have its license suspended for the Indian Point Unit 2 reactor due to persistent and pervasive, negligent management of the reactor which has endangered the public health and safety and the environment due to significant safety problems existent at the reactor for decades.

2.) Petitioners specifically request NRC investigate the potential misrepresentation of material fact by the utility to determine whether the significantly insufficient engineering calculations relied on to insure adequacy of the design of key systems, including the steam generator analysis and the electric bus analysis at the Indian Point Unit 2 reactor, was due to a lack of rigor and thoroughness or a result of deliberately misleading information.

3.) Should the investigation determine that Con Edison deliberately provided insufficient and false information, petitioners specifically request that Con Edison's operating license be revoked for its Indian Point Unit 2 reactor.

4.) Should NRC not revoke the license of Con Edison and the Indian Point Unit 2 reactor returns to operation, the petitioners specifically request that it remain on the list of agency focus reactors to oversee the operation of the reactor until such time as management demonstrates that it can fulfill its regulatory requirements and commitments.

5.) No license transfer requests should be approved for Indian Point 2 until such time that the management can demonstrate that the UFSAR, CR back log, and maintenance requirements are up to date and workers have been retrained to the complete and revised UFSAR.

6.) The Petitioners specifically request that NRC maintain the Indian Point Unit 2 nuclear power station off-line until the fundamental breakdown in management is analyzed and corrected, which would include:

- An analysis of root causes for the FSARs and maintenance deficiencies is documented and made available to the public
- A complete, and accurate updated FSAR; reform is impossible if the basic document is inadequate.
- An evaluation of all 50.59 issues be initiated to confirm their validity, if UFSAR does not match the "as built" reactor configurations.
- An effective ALARA review is instituted and documented
- Root causes of systemic mismanagement are documented
- Utility demonstrates through its management practices a commitment over a substantial period of time to adhere to and respect regulatory requirements.
- Management of Indian Point Unit 2 retrains personnel involved in all current modifications to systems or components or parts there of.
- Plant Design Changes Requests are updated and documented to include all changes to the reactor's design and that these design changes be verified by the NRC staff. Close-outs of PDCRs must receive high priority.
- Root causes of the backlog of repairs and lack of adequate maintenance be initiated and completed before restart.
- License amendments and exemptions to standard inspection intervals are reviewed and revised.

III BACKGROUND:

At present Indian Point Unit 2 is shutdown as new steam generators are installed. As the result of gross managerial failure to responsibly undertake and complete appropriate corrective actions in the interest of the public health and safety as communicated through numerous NRC information notices and generic letters. The reactor was operating with faulty steam generators, which led to an accident at Indian Point Unit 2 in February 2000 when a steam generator tube ruptured, causing a radioactive release. The resulting shut down of the reactor uncovered a series of deficiencies at the reactor as workers struggled to control the safe cool down and depressurization of Indian Point 2. NRC initiated an analysis of the accident which exposed systemic problems at the station through inspections, internal documents, and event occurrences for the reactor. These inspections uncovered serious concerns due to weaknesses and inaccuracies in the reactor's FSAR, technical specifications, design and licensing bases, communications, maintenance, inadequate procedures, and inadequate worker training.

In fact, this accident occurred after another incident in August 1999 which involved problems with the safety buses. The August bus loss disabled approximately 75% of the annunciators in the control room. After inspections by NRC staff, Con Edison made commitments to a "recovery plan" in response to the event. While this "recovery plan" was in effect, the February accident occurred. Both incidences involved failure of systems that Con Edison had sought relief from inspection on the basis of submitted analyses that proved inaccurate and which compromised the health and safety of workers, the public and the environment. NRC approved both deferrals of inspection on systems that failed. The public has no reasonable assurance that analyses for other safety-related systems are accurate.

As the NRC acknowledged in the Millstone debacle, the UFSAR is the essential document for reactor operations since it clarifies regulatory requirements, determines the need for recalculation and design, establishes the need for worker retraining, and protects workers from unnecessary exposure to radiation, thereby meeting the ALARA standard. To adequately address these factors, routine updating of the FSAR is required. Without the regulatory requirements being met by Con Edison, the health and safety of workers and the public is compromised. The FSAR is required by NRC to assure staff that the reactor is in compliance with regulations. The commitments made by the licensee to maintain an accurate and updated FSAR are legal requirements.

The FSAR is the blueprint documenting changes to the reactor and its operation. It requires consistent, timely updating to maintain the current condition of reactor operations, making information accessible to reactor staff and allowing staff to effectively handle both routine operation and abnormal occurrences. Without it, the safety of the workers, the public, and the environment are at risk.

In the absence of an updated and accurate FSAR, personnel lack information on how the reactor systems and components operate together. Changes occurring in the reactor design would be hard to determine, requiring a case specific investigation. Impacts of the design changes on other systems would require the same analysis. A licensee is unable to train workers with a deficient FSAR. Workers could be responding to different and conflicting updates of the FSAR, leading to confusion and conflict in addressing both standard operation and abnormal occurrences; coordinated effort by personnel would be difficult.

The case by case scenario for problem solving would increase the likelihood of unnecessary worker exposure . It would eliminate the ability for personnel to practice a "lessons learned" approach to problems. Requirements for ALARA analysis would be compromised. Workers would have to reinvent

the wheel when confronted with problems. This would expose workers routinely to higher doses of radiation.

The staff would function in a reactive, "crisis" oriented framework. The problems of aging reactors would compound the problems encountered with operating with a deficient FSAR. It would be harder to determine effective calculations to set conservative limits on deteriorating systems.

In addition the inability of the licensee to engage in timely maintenance of back-up safety systems and systems central to the safe operation of the reactor jeopardizes the health and safety of the workers, the public, and the environment. Con Edison's negligence led not only to the bus failure in August 99 and tube failure in the February 2000 accident, but to the failure of other significant systems that compromised the safety of both the workers and the public.

There are inspection reports, internal review documents, and event occurrences, and an event inquiry by the NRC Office of the Inspector General document a prolonged history of significant mismanagement of the operation of the Indian Point 2 nuclear power station. These **INSPECTION REPORTS** include:

NRC Augmented Inspection Team-Steam Generator Tube Failure-Report No. 05000247/2000-002 (April 28, 00) in which the Team acknowledges under root causes longstanding systemic mismanagement issues that have historically been experienced at other nuclear stations in the Northeast:

- Equipment Performance Problems
- Operator Performance
- Procedure Quality
- Technical Support
- Corrective Actions

NRC in fact is cognizant of the systemic scope of mismanagement problems at Indian Point Unit 2, as summarized in the May 23, 2000 letter notifying Con Edison of Indian Point Unit 2's classification as an agency focus reactor. Specifically, senior management have noted "concerns that illustrate a number of longstanding performance issues" and that the August 31, 1999 and February 15, 2000 emergencies "revealed several interrelated problems: (1) communication and coordination weaknesses among various site organizations; (2) engineering support shortcomings that led to narrowly focused assessment of plant problems; (3) configuration management/control problems; (4) equipment reliability problems and large corrective action backlogs; and (5) operator knowledge, station training, and procedural weaknesses. ... The senior managers concluded that the broad performance issues that have existed at Indian Point 2 for the past several years have revealed deficiencies in licensee corrective action program efforts. A number of utility improvement initiatives have yielded some progress but, overall, have been limited in remedying the underlying problems. ... [A]chieving fundamental improvements including corrective action program efforts, and dealing with legacy issues, will require consistent corporate support to the station" (Letter to Mr. Eugene R. McGrath, Con Edison, 5/23/00).

The NRC Augmented Inspection Team's July 10 2000 report (05000247/2000-007-008) notes that the volume of corrective actions resulting from the current shutdown has impeded Con Edison's progress on longer term departmental improvements:

> The recent forced outage has delayed completion of some departmental plan actions. One specific action delayed involved the establishment and staffing of the work control organization initially scheduled for completion in June 2000. The primary purpose of the additional staff was used to support reduction in the maintenance backlogs through improvements and efficiency within the work control center.
>
> Though some improvement has been noted in Con Edison's performance indicators associated with the Business Plan, an overwhelming majority of issues have not met the established goals. For example, the corrective action program performance indicators show that improvement was achieved in timeliness of resolution; however, Con Edison has just recently initiated actions to evaluate the quality of the analyses and root causes. ... Continuous self-assessment of Business Plan items with current performance observations appeared inconsistent and the overall expectation was not evident (pp. 12-13).

With an eye toward restarting the reactor as soon as possible, Con Edison's efforts to deal with a large volume of immediate maintenance needs, including replacement of the steam generators, may actually be impeding needed efforts to address the root causes of the broad spectrum of problems at the reactor. Without solid evidence that Con Edison has addressed the root causes of systemic mismanagement, brought the reactor within compliance with its licensing and design bases, and established that the material condition of safety-significant reactor components is within safe limits, there is no reason to believe that Con Edison is any more qualified to operate Indian Point 2 now than it was 10 months ago.

IV ADDENDUM: Indian Point Unit 2

Some recent inadequacies at Indian Point Unit 2 were discussed in the reviews following the accident in February, longstanding problems involve many of the systems and worker practices that failed during the February accident. The steam generator tube failure event demonstrated numerous, systemic problems at the station that included: managerial disregard for NRC communications in the form of information notices, generic letters, Secys, and NUREG studies, equipment performance and failure, operator performance, procedure quality, technical support, lapses in engineering support, the buildup of equipment deficiencies, emergency response capacity, and corrective actions. These cascading problems resulted in a delay in stopping primary to secondary water leakage and delayed cold shutdown. They are as follows:

1. ERRORS IN LICENSING/DESIGN BASIS DOCUMENTATION

INSPECTION REPORT: 05000247/00: The pressure control valve used to control steam pressure to the Steam Jet Air Ejector had been out of service for many years and controlling steam flow manually using bypass valves had become "normal" procedure. The protective functions of the automatic closure valve are defeated when operating in a manual mode. "The licensee removed the Stem Jet Air Ejector steam supply pressure control valve from service in 1998 and decided not to pursue fixing this deficiency. ... However, the licensee failed to update the applicable system operating procedures and abnormal operating instructions to reflect this design change."

INSPECTION REPORT: 05000247/00: The team noted several longstanding design deficiencies with the IVSW system. Since *1984 there have been 6 LERs* involving leakage in valves sealed by the

system exceeding the TS limit. In 1997 LER was submitted noting that the system was not performing per design as stated in the UFSAR and in 1998 DBD (design basis documentation) for the system identified discrepancies documented in CR 1998-10169; initial calculations raised serious questions about the ability of the system to meet design requirements. This raises questions about whether the system can meet its design or TS requirements.

LER 36660: 2/2/00 Validity of Assumptions for the 30 Minute Nitrogen Backup Supply In Question: During review of Con Ed calculation FIX00300-00, Nitrogen Backup Supply for Control of Auxiliary Feedwater Flow Control Valves, Turbine Driven Auxiliary Feedwater Pump, and Atmospheric Steam Dump Controls, questions arose as to the validity of the assumption. Statements that resulted in the design basis for 30 minutes of Nitrogen could not be sustained. A third Nitrogen bottle was placed in backup alignment to maintain the 30-minute requirement.

NRR DAILY SIGNIFICANT EVENTS MR NUMBER: H-99-0096: 11/2/99 The IP2 8/31/99 is classified as a Significant Event. The bases for this classification were the number of complications that resulted and produced unnecessary burdens on Licensee's operational personnel coupled with the lapses in configuration control and management oversight. The team found that a primary cause was inadequacy in the configuration control management; the loss of bus 6A and the subsequent degradation of plant conditions were caused by two equipment configuration control problems: the station auxiliary transformer load tap changer being left in the "Manual" position; and the improper overcurrent setting for emergency diesel generator 23 output breaker. Station personnel failed to insure the equipment configuration was controlled as specified in the licensing and design bases.

LETTER TO A. ALAN BLIND, VP CON EDISON FROM A. RANDOLPH BLOUGH, DIRECTOR DIVISION OF REACTOR PROJECTS: 3/31/00 In communicating NRC assessment to IP2, NRC states that significant performance issues in the reactor safety strategic performance area included weaknesses in communication and coordination, configuration management/control, engineering support, and corrective actions program. These weaknesses included equipment problems and delayed mitigative actions associated with the 8/99 event. Equipment problems created significant complications such as lockout of offsite power supplies and the complete loss of power to some safety equipment. Additionally, ongoing problems in station work control processes, large corrective action backlogs, and repeated problems in the area of emergency preparedness contributed to the weaknesses.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 12/07/99 1999010 The number of items in engineering, maintenance, and corrective actions remains high. There has been no significant progress in reducing the backlog. Although efforts have been made to reduce backlog, they have been for the most part ineffectual.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/2099. Recovery Efforts for Restart. NRC uncovered many examples of mixed performance in Con Ed's recovery efforts including identification that a safety related breaker was returned to service even though the data obtained during testing was out of the licensee's pre-approved tolerances. During training of plant operators on newly issued procedures for recovery of the 480v safety bus following loss of power, numerous discrepancies were identified by NRC that necessitated procedure revision.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/2099. Con Ed clarified the chain of Command Roles and Responsibilities Informally. In response to the 8/31 event the licensee clarified chain of command roles and responsibilities. However this action was done informally which did not ensure that the corrective action would be sustained.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/2099. Con Ed implemented Abnormal Operating Instruction AOI 27.1.13 without operator verification. During training of operators on the procedure, numerous discrepancies were identified causing the licensee to revise and improve procedure. This constituted weak performance.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/2099.Con Ed did not implement measures for operation of the emergency diesel generator makeup water expansion tank when the auto fill capacity was disabled. Guidance for manual filling of the 23 EDG jacket water expansion tank was not provided to operators.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. Con Ed's Nuclear Safety Committee review of the 8/31 event lacked in a critical review of having the station transformer load tap changer in the manual position for an extended period of time. The committee did not initially recognize the manual position as a potential unreviewed safety issue and did not question the operability aspects of the deficient condition.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99, 10/25/99, NRC noted continued performance lapses in the temporarily facility change process with regard to operation of the 23 emergency diesel generator and the alternative control power to safely bus 2A.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 12/20/99 NRC found that Con Ed did not critically review the results of the calibration package and subsequently placed a safety related system back in service with a deficient amptector setting. This was a non-cited event. Breaker 21 EDG output breaker was returned to service inadvertently. Con Ed retested the breaker and was unable to duplicate the initial recorded results. Upon retest, Con Ed found that the breaker's settings were acceptable and could not explain the deficient as-left settings recorded and accepted in the calibration package

INSPECTION REPORT 05000247/2000-001: Several examples of incomplete detail or inconsistencies complicated operator efforts during a Mid-loop operating procedure used to reduce reactor vessel inventory in support of steam generator work. Mid-loop operation causes an increase in shutdown risk because of the reduced reactor vessel water level and resultant shorter time to boil reactor coolant in the event of a loss of decay heat removal. The procedure to drain inventory from the reactor coolant system is also risk significant, based upon the potential to lose residual heat removal pumps, the short time to lose reactor coolant subcooling, the opening within the reactor coolant system, and the reliance on administrative controls instead of automatic action to establish containment closure. Lack of detail in Temporary Operating Instruction (TOI) 265 to verify a reactor coolant level alarm resulted in extended time in reduced inventory. Also, operators lacked sufficient instructions on how to transition between TOI 265 and System Operating Procedure 1.1, including how frequently to monitor coolant level and what the alarm level set points would be. Operators had to call Operations Management to get the necessary information. Furthermore, the senior reactor operator controlling the operation had the wrong procedural revision.

INSPECTION REPORT 05000247/2000-009 (9/19/00): The inspector noted that the surveillance test (PT-R93) of the Essential Service Water Header Flow Balance did not assure that design requirements would be met as described in the UFSAR Table 9.6-1. Also, during the development of the service water system design basis document, Con Edison identified numerous differences on required service water flow to the fan cooler units, instrument air compressor closed cooling water heat exchanger and service water strainers.

INSPECTION REPORT 05000247/2000-007 (7/10/00): Although the UFSAR requires Indian Point Unit 2 to have remote start capability for the #'s 2 and 3 Gas Turbines, the reactor has not been able to remotely start the 2&3 GT's since 1994. Con Edison has neglected numerous opportunities to either correct the deficiency or apply for an "as-is" acceptance subject to 10 CFR 50.59 review. In one instance, a request for engineering support (RES) was filed in December, 1998, but during the inspection period (ending May 26, 2000) Con Edison was still in the initial stage of the engineering review process. Inspectors determined that Con Edison did not resolve conditions adverse to quality, and the inability to remotely start the 2&3 GT's is a violation of the licensing basis of the reactor (UFSAR) **(URI 05000247/2000-007-002)**.

INSPECTION REPORT 05000247/2000-003 (5/16/00): Con Edison did not recognize a long-standing difference between the design and licensing basis for the isolation valve seal water system (IVSWS). *The IVSWS has not been operable as described in UFSAR Section 6.5 or TS 3.3.C since initial plant startup* **(EEI 05000247/2000-003-03)**. Despite several past events and a design basis verification program, which highlighted IVSWS performance issues, Con Edison failed to correct a basic design deficiency and assure that the licensing basis was met. Operability evaluations were less than adequate and corrective actions were narrow and untimely.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 8/10/99. Documentation of training and qualifications for preparers and reviewers under 10 CFR 50.59 was not readily retrievable and in some instances not formally prescribed, creating difficulties in identifying who was qualified and what were their qualifications.

There was a potential weakness in consistently assuring that the assumptions credited in the safety evaluation were implemented in the associated documents given inconsistencies in two assumptions in Safety Evaluation (SE) 98-035-EV and the System Operating Procedure SOP 10.1.2 and previously documented NRC findings.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 2/01/99 Fuel Storage Building Projected Doses. In 1982 and 1991 ConEd made changes to the fuel storage building air filtration system design which decreased the ventilation flow rate that was assumed in the accident analysis for a fueling handling accident. ConEd failed to update the FSAR to reflect the impact of the changes on the projected doses to personnel in the FSB during a fuel handling accident. This is a violation of 10 CFR 50.71(e). This was a non-cited violation.

INSPECTION REPORT: 05000247/2000-002: Operator Logkeeping. The NRC Inspection Team noted that the operator logs were not maintained throughout the February event as required by administrative procedures. Operators did not log consistently significant plant items such as event declaration, implementation of the emergency plan, abnormal conditions, major plant evolutions, and equipment alignment changes.

INSPECTION REPORT: 05000247/2000-002: The Team reviewed OAD-33 "Procedure Adherence and Use" and noted inconsistent guidance pertaining to the requirements for allowing operators to deviate from a written procedure: (1) Section 4.4.1 was based on an American National Institute Standard, which allowed operators on their initiative to not follow procedure provided that the action was necessary; (2) Section 4.4.2 required the operator to obtain permission from a Senior Reactor Operator before deviating from a procedure.

2. **FAILURE TO TRANSLATE DESIGN BASES TO PROCEDURES AND HARDWARE:** On numerous occasions Con Edison chose to work around problems rather than correcting the system design problem or the degraded material condition.

INSPECTION REPORT: 05000247/00: During the accident the operators declared the isolation valve seal water system to be inoperable and entered a TS 301. TS 3.3C requires the Isolation Valve Seal Water tank to be maintained at a minimum pressure of 52psis and a volume of 144 gallons. Operators were unable to refill the tank above the required minimum level. It appeared that the system was draining into the component cooling water system. *A similar draindown of the tank occurred in 1997.* After the drain down the licensee revised the emergency operating procedures to work around the potential draindown rather than correcting the system.

INADEQUATE ENGINEERING AND MODIFICATIONS : Technical Specification 6.5.2.7 requires the licensee to review indications of an unanticipated deficiency in some aspect of design operation of safety related structures, systems, and components. The licensee had not performed a review of the degraded steam generator and the pre-event activities included degraded material conditions

INSPECTION REPORT: 05000247/00:. The Team found operator performance and procedural deficiencies unnecessarily complicated the licensee's response to the accident and extended the duration of the event and increased the radiological release to the environment. These deficiencies "challenged the TS and the procedural requirements."

LER 36621: 1/25/00 BROKEN WINDOW IN A HIGH ENERGY LINE BREAK DOOR PLACES PLANT IN AN UNANALYZED CONDITION. A broken window in a High Energy Line Break Door which is located between the Main Feed Regulating Valve Room and the Auxiliary Boiler Feed Pump Room placed the reactor in an unanalyzed condition. The door is supposed to remain closed *at all times* when the reactor is above 350 degrees F.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 1/24/00 Inoperable Cable Spreading Halon System. Con Edison failed to test the system.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/07/99. Implementation of a Temporary Facility Change. NRC identified deficiencies in a temporary facility change that installed a demineralizer for the Unit 1 irradiated fuel pool. NRC continued to identify *recurring problems* implementing temporary facility changes.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/07/99 Failure to establish and implement procedures required by TS 6.8.1 (4 examples) *Because an appropriate procedure did not exist,* condition monitoring of the No. 24 station battery was not preformed as required. Con Ed also failed to establish a procedure for performing a surveillance test required by TS. Con Ed failed to operate the turbine driven feedwater system in accordance with the system operating procedure and failed to document a deviation in a condition report. Con Ed lacked procedures for responding and recovering from loss of a single 480 volt vital bus. This was a contributing factor in the untimely restoration of off-site power to the vital buses during the 8/31 event.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/07/99. Violation of Essential Service water TS 3.3F.1b. In the 8/31 event operators exceeded the limiting condition for operation of service water system. Con Ed failed to cool down the reactor within the required time.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/2099. 10/25/00. Lack of Operational Safety Verification. NRC noted several degraded conditions on Gas Turbine No. 1(GT-1) that was not correctly addressed by the Corrective Actions Process.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 10/25/99. Operators not adhering to System Operating Procedure. Poor work coordination challenged operators and caused an unexpected reactor coolant system pressure increase. Operators mistakenly increased seal injection flow to a valve greater than allowed in a system operating procedure.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 9/06/99 Insufficient Operator Monitoring. NRC identified insufficient operator monitoring of air consumption to the weld channel and penetration pressurization system. Operators did not question the abnormal operation of flow integrator for zone 2 of the weld channel and penetration pressurization system.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 9/06/99. NRC identified a longstanding deficiency in that the flowrate to the seal water heat exchanger was in excess of that specified in the system operating procedure. The ***system engineer did not detect this deficiency during the July '99 walkdown***. The existing operator logs did not reveal the deficiency. Adequate configuration controls had not been previously specified.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 9/06/99 NRC identified the poor implementation of a temporary facility change in supplying fire water from a hydrant to a temporary demineralized plant. Con Ed did not perform an adequate review of the safety evaluation concerning the consequences of a fire hose rupture on the fire suppression system and the licensee's inattention to detail resulted in the identification of the wrong hydrant and the incorrect size of the fire connections documented in the TFC.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 9/27/00. Management oversight and response to the reactor trip on 8/31 and recovery actions were weak. Actions did not focus on understanding and limiting further risk to the reactor, but instead focused on developing shutdown work plans. *Senior management did not establish clear expectations that recovery from the degraded plant condition was a priority.*

Recovery action was poorly coordinated. Equipment plans and contingency planning were not clearly understood or defined. Engineering and maintenance support was ineffective. Loss of the annunciators occurred because plans to develop temporary facility changes were slow. Troubleshooting for Bus 6A was poorly planned and led to the inability to reestablish power to Bus 6A.

Support provided to operators before and during the event was weak. Poor communication existed between operations, engineering, and maintenance. Emergency plan procedure was deficient.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 8/24/99. NRC identified poor implementation of TFCs. Deficiencies included lack of changes for the gas turbine-2 and failure to fully implement safety evaluation limitation into a procedure for gas turbine-2.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 8/24/99. LER submitted after 30-day discovery of the event. Previous NRC Inspections 50-247/98-02 and 50-247/99-03 documented LERs not issued within the 30-day discovery period.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 6/08/99 NRC evaluation of post-accident sampling system found several equipment deficiencies and plant drawing deficiencies, making it difficult for a chemistry technician to acquire samples during a postulated emergency.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 3/15/99 NRC identified a poor configuration control practice involving the use of caution tags on degraded components. Con Ed did not have a clear policy for removal of tags.

2/01/99 NRC identified 5 deficiency tags. The concern with leaving deficiency tags in place once corrective maintenance is completed is that if a problem should occur again with the tagged component, workers could be misled into thinking the problem was already identified.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. NRC identified operators' inability to recognize a rod insertion event for two hours because of inadequate control board monitoring, incorrect log-keeping and inadequate audible cues that automatic control rod motion was occurring.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 3/15/99 Non-cited violation in failure to meet 10 CFR 50, Appendix B, Criterion V requirements. NRC identified that design assumptions and values specified in the supporting safety evaluation were lacking for Unit 1 spent fuel pool demineralization.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 4/27/00 Con Ed did not adhere to Unit 1 technical specifications 2.10.2.4 on January 16, 1999. No provision was established to notify an operator upon actuation of the spent fuel pool portable radiation monitor. The monitor would not have alarmed given an unintended loss of power. This item was previously documented in IR 50-247/99-01. Insufficient information was available concerning Unit 1's electrical loads that were impacted by planned maintenance.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 12/20/99 Plant Backlog Contained Unresolved Safety Significant Issues. NRC found that improvements initiated in response to the 8/31 event were unmet and performance remained weak in significant areas. A significant finding during recovery was that the plant backlog contained issues of safety significance that persisted without timely correction action or performing a safety evaluation. NRC determined that a number of non-cited violations of NRC regulations occurred.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 10/25/99 Service Water Leakage into Steam Generators. A leak in a high pressure feedwater sample cooler ***caused service water contamination in all four steam generators and significantly increased impurity levels above normal limits***. The failure to fully evaluate operating experience was a missed opportunity to prevent the event.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 8/24/99 Ineffective Planning and Execution of Maintenance. NRC is "concerned" with instances of ineffective planning and execution of maintenance activities. Examples include: inadequate contractor

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 8/10/99 Lack of Adequate Training: Due to high system engineer turnover, some systems engineers were not familiar with certain aspects of their system.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 7/09/99 Inadequate Toxic Gas Monitor Setpoints. Progress in the set point program procedure development was slow. Non-cited violation of the design control was identified related to the control room ventilation toxic gas monitor trip points.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/22/99 Exercise Weakness: Overall Poor Performance in the TSC. Several repeat training and communication deficiencies were noted resulting in a poor technical support center performance, which included (1) repair teams were not prioritized: (2) the staff failed to provide needed support for event mitigation: and staff's expertise was not fully utilized. Procedure implementation problems occurred in both the TSC manager and the plant Operations manager.

Repeat exercise weaknesses from 1998 and 1994 exercises were identified with respect to repair team dispatched to a radiological release; poor communication was noted in a number of areas; under utilization of qualified personnel; ConEd's critique was poor because it was not realistically self critical. This was also a reoccurrence of past poor performance.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/22/99 Failure to Use the EAL technical basis document during the August 31 99 event and a subsequent exercise. These issues are due to training, procedural and communication deficiencies.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 10/25/99 The early injection of boric acid into the secondary system was performed outside the conditions specified by the chemistry procedure and resulted in steam generator boric acid concentration and pH significantly outside the acceptable values.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-0014/27/99 Inaccurate Information. ConEd documented a notification on 10/29/98 of their conclusion that certain information provided to NRC was not accurate in all material respects by 10 CFR 50.59. Specifically the 1996, '97, and '98 Annual Effluent and Waste Disposal Reports For IP1 and IP2 Section A4.d "Liquid Effluents and Samples of Continuous Discharge." ConEd stated that the annual report would not have changed due to a lack of detection of alpha and other isotopes. Severity Level IV violation of 10 CFR 50.9 is treated as a non-cited violation.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 2/01/99 Health Physics postings for steam generator blowdown room were inadequate and allowed the inspector to walk through a contaminated area without appropriate protective clothing. The incident was not documented in a timely fashion or health physics corrective action program.

3. **DEGRADED MATERIAL CONDITIONS:** In the NRC augmented Inspection Team Report No. 05000247/2000 section3.0 it was noted that "several longstanding equipment performance problems challenged the operator response to the event and "reflected weaknesses in engineering, corrective action processes, and operational support." It was also noted although many of the equipment problems appeared minor they "required immediate operator attention, and collectively they appeared to increase the burden on operators, and ERO personnel."

investigation, ConEd was "unable to determine the cause of the reactor protection system spurious transients that initiated the August event. ConEd did *not evaluate the load tap changer in the manual mode when it was placed in manual in September 1998.*

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/20/99 ConEd evaluation to support an operations department modification initiated in 1991 was poor. The licensee did not evaluate the combined effect of solid-state and electro-pneumatic starting sequence timers on diesel loading. It had not evaluated the consequences on diesel loading of moving the service water pump starting time close to the component cooling pump and auxiliary pump starting time. Inspectors found that ConEd had not implemented administrative compensatory measures for operation of the emergency diesel generator makeup water expansion tank when the automatic fill capability was disabled. Guidance for manual filling of the 23 EDG jacket water expansion tank was not provided to operators. ConEd engineering had not controlled relay reset values for the reactor coolant pump undervoltage relays and was an example of poor performance.

Following the reactor transient on August 31, a plant operator documented a concern of not having a procedure for restoration of power to plant lighting buses. *Con Ed initially closed the issue in the corrective actions system without action.* After the inspector noted the closure, Con Ed initiated corrective action.

ConEd Nuclear Safety Committee review of the August 31 event condition report lacked a critical review of the station transformer load tap changer in the manual position for an extended period of time. The Committee did not recognize the manual position as a potential unreviewd safety concern and did not question the operability aspects of the deficient condition.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/20/99 ConEd identified a need to improve the reliability of the pager system used in emergency preparedness but deferred any action until July 2000 in order to resolve the engineering issues involved with pager reliability.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 9/06/99 Inspectors identified poor initial corrective actions in response to degraded sealant for environmentally qualified components. Subsequent inspection by ConEd led to additional corrective actions, including a number of formal operability determinations, development of formal acceptance criteria, and *numerous reinspections of components.* Adequate confirguation controls had not been previously specified.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 9/27/99. Weaknesses in plant configuration control were the primary causes of the loss-of-offsite power to all four vital 480 volt (v) buses following the reactor trip. Offsite power was lost to the vital buses because the station auxiliary transformer load tap changer was not in the "automatic" position. *This condition has existed since September 1998, contrary to plant licensing basis.*

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 9/27/99. Instances of poor or ineffective use of the corrective actions process contributed to events leading to the plant trip with complications. Station personnel did not take prompt action to fully evaluate equipment problems for their impact on operation.

Station personnel did not develop root causes for prior anomalies and deficient conditions associated with the reactor protection system Over Temperature/Delta Temperature signal. This initiated the event.

result of incomplete flushing and removal of steam generator water from the secondary boiler blowdown purification system, used to drain the #24 steam generator to 11 waste collection tank between February 18-20. The procedures did not consider potential lifting of a relief valve on the Unit 1 flash tank, isolation of a valve to ensure nitrogen pressurization, and a pressure limitation that would have precluded secondary pressurization.

LER 199-013 (as Updated in INSPECTION REPORT 05000247/2000-001): Con Edison failed to meet timeliness criteria for corrective actions as described in station administrative order (SAO)-112. On August 19, 1999 Con Edison identified a condition outside the design basis of the facility and *which was part of the original plant design, in violation of the Final Safety Analysis Report.* Con Edison identified that a single failure of 125 volt DC power could result in an emergency diesel generator malfunctioning during certain loss of offsite power scenarios. The inspector noted that Con Edison failed to update the LER on December 20, 1999, as they had committed to do. The inspector further noted that within Con Edison's corrective action program no assignment existed to ensure the supplemental report was provided to NRC. SAO-112 requires the licensee's investigation to be completed within 30 days from the event date, but the LER remained open at the end of the inspection period (April 13, 2000 – 191 days later).

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001: The inspector identified that Con Edison failed to properly account historical fault exposure unavailability hours for the 23 emergency diesel generator. Emergency Diesel Generator (EDG) 23 was unavailable for 1,444 hours from July 2-August 31, 1999, unknown to Con Edison. It was later discovered, in the review of the August 31 emergency, that the EDG output breaker amptector setting was improper. The error occurred because the system engineer did not fully understand the industry guidance, and Con Edison had inadequate guidance on the method to gather and calculate the NRC performance indicators.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/07/99. IP2 failed to establish appropriate undervoltage relay pickup settings when modification EGP-91-06786-E was implemented. This was a violation of the design control requirements 10 CFR 50, Appendix B, Criterion III.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/07/99 Operation of the station auxillary transformer load tap changer in the manual mode placed the plant outside of its licensing basis and directly contributed to the loss of offsite power to the four 480 VAC vital buses. IP2 failed to translate applicable regulatory requirements and the design basis into procedures. This was a violation of 10 CFR 50, Appendix B, Criterion III. Extended power operation with the 138 Kilovolt electrical system inoperable was an apparent violation of TS 3.7.B.3

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/07/99. An inadequate calibration and test procedure resulted in the miscalibration of the 23 emergency diesel generator output breaker in May '99. During the August '99 loss of offsite power incident, the breaker tripped when the bus 6A loads started resulting in the loss of the bus. Power operation in excess of *7 days* with an inoperable emergency diesel generator was a violation of TS 3.7.B.1. Failure to implement an adequate test program to assure satisfactory operation was a violation of 10 CFR 50, Appendix B, Criterion XI.

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 12/20/99. Inspector's review found that ConEd implemented Abnormal Operations Instructions AOI 27.1.13 "Loss of 480V Bus" without operator verification. This was an example of weak performance. Even with an extensive

None of the TFCs were evaluated to minimize the consequence on a loss of electrical power, and electrical protective features (i.e., ground fault) only existed at the Unit 1 supply breaker.

INSPECTION REPORT 05000247/2000-003: On March 7, workers failed to follow proper procedures and use the required administrative controls while operating the polar crane to lift the 23 Reactor Coolant Pump. The inspector determined through interviews that not all personnel associated with the activity were familiar with the administrative controls for heavy loads. On March 8, while restoring the 22 Steam Generator hillside port, workers failed to follow the torque sequence described in the operating procedure.

INSPECTION REPORT 05000247/2000-003: The NRC inspector observed Con Edison's preparations to test the Turbine Building Crane. Con Edison planned to test the crane by lifting 66,000 gallons of water in water bags. Incomplete planning occurred for the load test since the potential failure of the load and impact on safe shutdown equipment was not evaluated. Workers did not realize these shortcomings until the inspector raised a question about the consequences of a failure and the impact on shutdown risk and of internal flooding of the safety-related 480-volt switchgear room. Ultimately, the test had to be postponed until a major overhaul on the main and auxiliary hoist gearboxes, brakes and hook blocks was completed.

INSPECTION REPORTS 05000247/2000-003 & 05000247/2000-005 (6/26/00): Con Edison failed to incorporate the requirements of 10 CFR 50 Appendix R, Section III.O in the design of the oil collection system for the 23 Reactor Coolant Pump (RCP). Con Ed identified oil leakage from the vent pipe, and three of four RCP lower motor reservoir drain lines were not enclosed by the oil collection system as required. The failure to collect leakage from the vent pipe and the lower oil reservoir drain lines is considered a violation of 10 CFR 50 Appendix R, Section III **(NCV 05000247/2000-003-02)**. Following the required modifications, the inspector verified the adequacy of the installed enhancements (IR 05000247/2000-005). The inspector noted that sealant had not been applied between the support flange and flywheel cover flange on the 24 RCP, as required. Without this sealant applied, the potential still existed for oil to leak out and not be captured by the oil collection system.

INSPECTION REPORT 05000247/2000-003: Con Edison failed to maintain provisions of the NRC-approved fire protection plan as described in the UFSAR and approved NRC Safety Evaluation Report (dated October 31, 1980). This resulted in the malfunction of four of ten fire dampers in the Cable Spreading Room, and constituted a degradation in the fire suppression system between December 1999 and March 2000. The failure to provide adequate maintenance instructions that resulted in an inoperable Cable Spreading Room halon system was a Severity Level IV violation of License Condition 2.K **(NCV 05000247/2000-003-04)**.

INSPECTION REPORT 05000247/2000-001 (4/13/00): During the Mid-loop Operation procedure to remove reactor vessel inventory in order to drain #24 steam generator, a control room alarm did not function properly and workers were slow to respond to the failure. The control room alarm for "MID LOOP" did not initially annunciate when level went below the set point of 65 feet, and did not annunciate until the reactor vessel level decreased to 62 feet. The alarm failed to operate as required, and the inspector concluded that operators could have questioned this sooner.

INSPECTION REPORT 05000247/2000-001: Work planning and radiation control problems created delays in other recovery operations and complicated normal operations at Unit 1. Incomplete system operating procedures resulted in the contamination of a discharge pathway and interfered with normal operation of the Unit 1 waste processing system. Twice, Unit 1 operators were prevented from performing a planned discharge because of an unexpected radiation alarm. The alarms were the

failure did not provide the specific steps for placing the pressurizer auxiliary spray in service during plant cooldown. This inadequacy in the written procedures complicated the operators' efforts to safely shut down the reactor following the February 15 steam generator tube rupture, leading to a 1-hour delay in safely shutting down the reactor. Failure to initiate Condition Reports and take appropriate actions is a violation of 10 CFR 50, Appendix B, Criterion V **(NCV 05000247/2000-007-005)**.

INSPECTION REPORT 05000247/2000-007: The Augmented Inspection Team noted that control room operator log entries did not include significant plant items such as the event declaration, implementation of the emergency plan, abnormal indications, and major plant evolutions as required by Operations Administrative Directive OAD-3. This violation was a repeat of the August 31, 1999, event. The failure was also a violation of Technical Specification 6.8.1.a **(NCV 05000247/2000-007-006)**.

INSPECTION REPORT 05000247/2000-007: Con Edison exceeded the safe rate for reactor cooldown during the February 15 event. The safe cooldown limit is 100 degrees per hour, but operators achieved a cooldown rate of 103 degrees per hour in shutting down the reactor due to several problems with the high pressure steam dump (HPSD) system. Among these problems were: (1) the HPSD system at Indian Point 2 was known to function erratically under certain conditions; (2) the HPSD controller was not properly tuned; (3) known HPSD design deficiencies; and (4) operators were not properly trained because the HPSD response in the simulator was 10 times slower than the plant's actual response. Also, operators failed to identify the system response problems even though accurate indications of temperature and pressure were available in the control room. The failure to maintain a safe reactor cooldown rate is a violation of Technical Specification 3.1.B **(NCV 05000247/2000-007-007)**.

INSPECTION REPORT 05000247/2000-007: Inspectors noted a number of problems with Emergency Operating Procedures (EOPs) that arose during the emergency shutdown following the steam generator tube rupture. In one case, Con Edison failed to validate and verify an August 1998 revision to the shutdown cooling pressure limits for the residual heat removal (RHR) system in EOP ES-3.1. This was a violation of Technical Specification 6.8.2 **(NCV 05000247/2000-007-008)**. Other inadequacies affected the functioning of the RHR system and the use of the auxiliary spray system. Con Edison's failure to translate design information into plant procedures was a violation of 10 CFR 50 Appendix B, Criterion III, "Design Control" **(NCV 05000247/2000-007-009)**.

INSPECTION REPORT 05000247/2000-003 (5/16/00): During the effort to shut down and depressurize the reactor following the February 15, 2000 Steam Generator Tube Failure, operators exceeded the safe shutdown limits for reactor differential temperature. Station Operating Procedure 4.2.1 requires operators to limit the temperature difference between the hot and cold legs in the reactor coolant system to 72 degrees Fahrenheit in order to prevent a potential failure of the material condition of the reactor vessel components, including the baffle-former and baffle-barrel bolts.

INSPECTION REPORT 05000247/2000-003: On March 2, 2000, power and compressed air supply was lost to the steam generator nozzle dams when a worker tripped on and inadvertently disconnected a temporary 480v power supply. Poor communication between maintenance personnel and control room operators nearly resulted in a serious worker injury. Control room operators were not aware of the systems being operated and maintained by building and grounds personnel. *Control room personnel were not notified of the cause for the loss of power and re-energized the temporary 480v power supply while maintenance personnel were repairing the 480v cable.* The event involved inadequate descriptions of several temporary facility changes (TFCs), including six that provided temporary electrical power and air supply to containment from a Unit 1 13.8 kilovolt supply breaker.

Specification 6.8.1 **(NCV 0500247/2000-011-02)** and License Condition 2.K **(NCV 05000247/2000-011-003)** respectively.

INSPECTION REPORT 05000247/2000-009 (9/19/00): The inspector noted several problems with the refueling equipment which complicated the core offload, and inadequate procedure use in the vessel disassembly. Problems with some of the refueling equipment were in the work backlog, but were not corrected prior to the start of vessel disassembly, demonstrating continued poor maintenance planning and work control, as well as the inability to prioritize backlog items appropriately or make significant progress on reducing the volume of the backlog. During the vessel disassembly, the controlling copy of the refueling procedure was not maintained current with plant conditions and the controlled copy outside containment.

INSPECTION REPORT 05000247/2000-008 (8/7/00): The inspector noted poor preparation and planning for a surveillance test PT-R141, "Manual Phase A Testing, Revision 0." (Phase A is a mode of operation used during certain reactor shutdown scenarios which require the residual heat removal system, including during the February 15 event.) The inspector's walkdown prior to the surveillance identified that numerous containment isolation valves were either not in their required pre-test alignment, or were isolated with various equipment tagouts. Further, the inspector discovered that surveillance test PT-V8A, "Auxiliary Boiler Feed Pump Turbine Mechanical Overspeed Trip Test," contained inconsistent guidance on the procedure for restoring the system to service. The procedure did not provide consistent instructions to vent air pressure in the steam line prior to maintenance removal of the air supply connection.

INSPECTION REPORT 05000247/2000-007 (7/10/00): Con Edison did not perform a formal operability determination for a charging pump seal water tank (CPSWT). Furthermore, Con Edison failed to monitor, review, and approve the work of a contractor that had worked on the CPSWT. Failure to properly document and accept the bases for the operability determination is a violation of 10 CFR 50, Appendix B, Criterion V **(NCV 05000247/2000-007-001)**.

INSPECTION REPORT 05000247/2000-007: Con Edison did not properly identify and evaluate the full scope of modifications to the Chemical Volume and Control System Power Supply in the required safety evaluation. Although the modifications involved installing new electrical cables to complete a wiring change, two different sections of the safety evaluation (SE 98-274-MM) incorrectly indicated (1) that the modification did not add any new wiring or cables, and (2) that the proposed change did not add cable or affect cable routing. The failure to properly identify and evaluate these changes involved a lack of work control and was an additional violation of 10 CFR 50, Appendix B, Criterion V **(NCV 05000247/2000-007-003)**.

INSPECTION REPORT 05000247/2000-007: NRC Augmented Inspection Team report 05000247/2000-002 documented long-standing equipment problems on the steam generator nitrogen-16 radiation monitor. Monitor recorder malfunctions were identified in April 1999, and power level potentiometer problems were identified in December 1999. However, Con Edison did not take timely corrective actions, and none of the problems had been resolved before the February 15 steam generator tube failure. The failure is considered a violation of 10 CFR 50 Appendix B, Criterion XVI **(NCV 05000247/2000-007-004)**.

INSPECTION REPORT 05000247/2000-007: The Augmented Inspection Team identified that problems with Con Edison's corrective action tracking system create a variety of inefficiencies and problems had compromised work control and led to inconsistencies and errors in the corrective actions taken. In one instance, emergency operating procedure guidance for a steam generator tube

oversight during gas turbine operations, poor planning and awareness of plant equipment as it relates to central control room ventilation, ineffective planning of leak-rate surveillance, inadequate pre-job briefings for Unit 1 ventilation work, and poor coordination between operations and maintenance on containment isolation valve work.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 4/27/99 Missed TS Surveillance Interval involving the liquid effluent monitor for service water, the component cooling water radiation monitor, the house service boiler condensate return line, and the area radiation monitor for the drumming station. The cause of the failure to perform the required surveillance was "human error." (LERs 98-001 and 98-017 previously raised the same issue and were assessed for enforcement action by NRC.) NRC will treat the violation of NRC regulations as a non-cited violation.

INSPECTION REPORT O5000247/2000-011 (10/30/00): Several problems were identified in Con Edison's fire protection program and equipment, including a containment fire on September 3, 2000. Degraded fire barriers and errors in the fire hazards analysis drawings (UFSAR) were identified in zones 74A (barriers and drawings) and 1A (drawings). On September 3, poor work planning during welding and grinding operation in containment resulted in a fire which could not be extinguished quickly because it was underneath steel decking. The decking had to be removed before the fire could be put out, which lasted 25 minutes. Also, there were problems with the fire brigade response. Poor communication with the control room prevented the timely evacuation of non-essential personnel from containment. Further, the fire brigade's pre-fire plan lacked instructions on how to properly connect the fire hoses to achieve the necessary water pressure. These deficiencies constitute a violation of License Condition 2.K **(NCV 05000247/2000-011-01)**. Numerous other degraded fire protection systems have been identified in other inspection reports, including cable spreading room fire dampers (05000247/2000-003, see below), the emergency diesel generator sprinkler system (05000247/2000-009), fire suppression line leaks (05000247/2000-009), and errors in the fire hazards analysis drawings (05000247/2000-009).

INSPECTION REPORT O5000247/2000-011: A number of degraded deficiencies in the central control room were not initially identified as control room deficiencies or operator workarounds, as required by operations administrative directive (OAD)-41, "Operator Burden." The inspector learned that these degraded issues were not identified by the operations department, highlighted on the condition report, or identified by the corrective action screening committee as a potential operator burden. Also, a number of deficiencies still had deficiency ID tags on the components after the maintenance had been completed, potentially misleading operators about the material condition of control room equipment. The inspector concluded that approximately half of the closed deficiencies and workarounds had reoccurred since they were initially identified as a degraded condition.

INSPECTION REPORT O5000247/2000-011: Several lapses in control of outage activities were noted: (a) on August 24 – inadequate control of reactor vessel water level while landing the upper internals in the vessel due to poor coordination between the control room and refueling personnel; (b) on August 30 – inadequate instructions to workers completing a modification on the pressurizer relief tank resulted in the inadvertent cutting of the nitrogen line to the accumulators; (c) on September 3 – inadequate control of the fire hazards during welding on cavity deck plates resulting in a containment fire and Notification of Unusual Event declaration; (d) on September 14-15 – lapses in control and delayed identification of the source of asbestos contamination resulting in a cessation of containment work on two occasions; and, (e) on September 27 – inadvertent release of hydrazine to the floor and storm drains while draining steam generators due to failure to track the status of chemical additions to the secondary side during the outage. Issues (b) and (c) above involved violations of Technical

INSPECTION REPORT: 05000247/00: Equipment deficiencies that reduced the effectiveness of the Main Steam Line radiation monitors used to monitor changes in the pre-event primary to secondary leak rated. This deficiency had be previously noted and uncorrected.

- The strip chart recorder for the Main Steam line radiation monitors had been out of service *since April '99. The equipment problem reduced the pre-event steam generator leak rate information*
- The potentiometer used to set the reactor power level input into the leak rate calculation circuit on the Main Steam line radiation monitors had not functioned properly since *December 1999.*

CRs 199907799 and 2000001215: Operators observed erratic High Pressure Steam Dump Valve operation following the reactor trip while operating the Steam Dump valves in the automatic mode under pressure control. Because of this, the licensee decided to operate the valves in manual for plant cool down.

INSPECTION REPORT: 05000247/00: NRC Team operated the valves in the plant simulator and determined that cool-down rate was controllable when the high-pressure steam dump valves were operated in slow speed. The Team determined that mis-operation of the valve's control "T" switch, combined with a failure to effectively monitor plant conditions, were causal factors for the excessive initial cool-down.

INSPECTION REPORT: 05000247/00: The Mechanical Vacuum Pumps were so degraded that the main condenser could not be used as a heat sink for the reactor cooldown. This resulted in the automatic closure of the High Pressure Steam Dump valves. Operators opened the ASDVs and discharged steam to the atmosphere to continue reactor cooldown. *This created an additional radiological release path to the environment.*

The pressure control valve used to control steam pressure to the Steam Jet Air Ejector had been out of service for many years and controlling steam flow manually using bypass valves had become "normal" procedure. The protective functions of the automatic closure valve are defeated when operating in a manual mode. "The licensee removed the Steam Jet Air Ejector steam supply pressure control valve from service in 1998 and decided not to pursue fixing this deficiency."

INSPECTION REPORT: 05000247/00: The condenser vacuum was lost for a second time and cooldown was shifted to the ASDVs. The #22 condenser vacuum pump thermal overload device tripped after 6 hours. There was a 1997 deficiency tag issued which stated that the pump had a known deficiency of tripping on thermal overload. Condenser vacuum when cooldown was shifted to #21 mechanical vacuum pump. The Team determined that " in both cases the loss of condenser vacuum was due to longstanding equipment deficiencies that were not resolved in a timely manner."

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 3/15/99 1999001 NRC evaluation of work control process indicated inconsistent planning and scheduling activities as well as problems with tag out accuracy contributed to an increase in safety-related component unavailability. Numerous minor discrepancies were observed between check off lists and equipment labeling.

INSPECTION REPORT: 05000247/00: Temperatures in the auxiliary feedwater pump room was higher than normal due to plywood being installed over the AFWP room vent inadvertently.

Some additional inadequacies involving FSAR inaccuracies, operation outside of design basis and problems with accident mitigation systems are outlined in the event reports listed below.

LER 37476: On June 9, 2000 during battery load testing, 22 Battery failed its 2-hour minimum voltage characteristic (110.2VDC) and it failed to satisfy its required amp-hour capacity. These batteries are used to provide primary source of 125v DC power to safeguard equipment and logic circuitry at IP2. Analysis of samples revealed cracks within the positive active material, small pores, and small particulate size.

LER 36621: 1/25/00 BROKEN WINDOW IN A HIGH ENERGY LINE BREAK DOOR PLACES PLANT IN AN UNANALYZED CONDITION. A broken window in a High Energy Line Break Door which is located between the Main Feed Regulating Valve Room and the Auxiliary Boiler Feed Pump Room placed the reactor in an unanalyzed condition. The door is supposed to remain closed *at all times* when the reactor is above 350 degrees F.

LER 37240: 8/19/00 Failure of A 35-Curie Iridium-192 Source to Retract To Its Shielded Position Within A Radiography Camera Operated By Raytheon Personnel

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 1/24/00 Inoperable Cable Spreading Halon System.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 6/08/99 NRC evaluation of post-accident sampling system found several equipment deficiencies, plant drawing deficiencies, making it difficult for a chemistry technician to acquire samples during a postulated emergency.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 12/07/99 Plant material conditions continue to "challenge" plant staff. The total number of outstanding work orders remains high and continued to challenge operators and plant staff.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 12/20/99 Con Ed did not correct deficiencies in the saturation temperature monitor, the 23 accumulator level instrument, and the power range high flux setpoint in violation of NRC requirements. (CR199906113, CR199810074, CR1999808160)

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 10/25/99 The installed containment hydrogen monitoring system remained inoperable due to heat trace system deficiencies. Although Con Ed established an alternative monitoring method, the inability of the licensee to recognize that the hydrogen analyzer was inoperable and establish appropriate compensatory measures in a timely manner is a performance deficiency.

PLANT PERFORMANCE REVIEW-INDIAN POINT 2: 3/31/00 PLANT ISSUE MATRIX. 12/20/99. 10/25/99 NRC identified ***long-standing degraded conditions on safety related and risk significant pumps, which indicate a weakness in problem identification and corrective actions. These include tracking and review of degraded conditions, in causal analysis, in understanding the licensing basis, and corrective actions effectiveness.***

LER 37522: 11/15/00 The Emergency Response Data System was unavailable from 11/8/00-11/14/00.

INSPECTION REPORT 05000247/2000-001: There was a large total backlog of uncompleted post maintenance tests (PMTs) for equipment returned back to service. Approximately 130 PMTs were outstanding, 10% of which would require a refueling outage to accomplish. Most of the oustanding PMTs were about 2 years old, with the oldest being October, 1995. About 37% of the backlog was related either to safety-significant, important-to-safety, or risk significant components. Inspector review of the backlog noted numerous examples where documentation did not exist to conclude that the safety related component could perform its intended safety function. Although Con Edison has planned improvements to its work control and test plans since 1997 (including one originally to be implemented in October 2000) inspectors noted that none of Con Edison's plans precluded a large backlog of PMTs for safety-related equipment.

INSPECTION REPORT 05000247/2000-008 (8/7/00): While doing maintenance on feeder cables for motor control center (MCC) 21, Con Edison discovered degraded ground straps on the power cables for MCC-21, service water pumps (SWP) 25 and 26, and feeds for other reactor equipment. *The cables were damaged as a result of a longstanding condition that had previously gone undiscovered.* The soil under the intake structure's foundation slab had not been compacted uniformly, and an underground cable duct shifted and separated from the foundation slab. Con Edison measured a hole 4 feet wide by 12 inches deep by 7 feet long beneath the foundation slab. The power cables to MCC-21 and the SWPs had to be replaced.

INSPECTION REPORT 05000247/2000-008: Con Edison retrieved debris from the reactor vessel which was attributed to past maintenance practices. After removing the debris and coolant pumps were restarted, a loose part (weighing .25 to .5 pounds) was detected in the lower reactor vessel when a digital metal impact monitoring system alarm sounded. Loose parts within the reactor vessel, beyond a certain size, can result in damage to various reactor and coolant system components, as well as damage to fuel cladding and blockage of coolant water flow. Although Con Edison's safety evaluation determined that the debris detected would not affect safe operation, the condition requires increased monitoring of coolant system leakage, coolant flow blockage, and fuel cladding integrity, as well as preparedness for resulting accident scenarios. Con Edison's willingness to forego preventative maintenance on the front end by adding to the burden on operators (already responsible for a managing a large number of workarounds and a large maintenance backlog), is consistent with the pattern of systemic mismanagement that led to the steam generator tube rupture, safety bus failures, and failure to repair the isolation valve seal water system.

INSPECTION REPORT 05000247/2000-005 (6/26/00): Several problems with the refueling machine and fuel transfer system prolonged the core offload sequence and revealed inadequacies in preventative maintenance practices for the refueling equipment. The core defueling sequence was also delayed due to a broken spring screw on fuel assembly Q67, and a broken fuel plate alignment pin in the top nozzle of fuel assembly P54. Furthermore, a manipulator crane control circuit provided an erroneous indication while Con Edison was loading a fuel assembly in the core on April 13. Con Edison's investigation identified that the circuit was miswired, differing from both the UFSAR and the latest design changes. The inspector identified that, in addition to providing an erroneous indication, *the wiring problem could have allowed the manipulator crane gripper to release prior to the fuel assembly being fully loaded into the core.* The failure to adequately control the manipulator crane circuits and refueling interlocks was a violation of 10 CFR 50, Appendix B, Criterion III **(NCV 05000247/2000-005-01)**.

INSPECTION REPORT 05000247/2000-003 (5/16/00): Station Operating Procedure 1.1 did not require operators to vent the alternate safe shutdown pressurizer level instrument. As a result, the

instrument was in a degraded condition, with a nitrogen bubble that caused it to provide inaccurate readings. This level instrument would be used during a reactor shutdown if the control room were inaccessible (UFSAR).

INSPECTION REPORT 05000247/2000-003: During inspections of the Containment Liner (per ASME Section XI, Subsection IWE), Con Edison identified degradation in a caulk seal installed in the joint between the insulated liner wall and the containment floor at the 46-foot elevation. The degraded seal allowed water to seep behind the insulation and contact the carbon steel liner. Further investigations in areas behind the degraded seal identified corrosion and wall loss in the liner at and below the floor level. The zinc-based epoxy was missing in some locations with extensive wall loss. The corrosion was the result of multiple degraded conditions including: missing or deteriorated moisture barrier seals, which allowed extended wetting of the liner with borated water; and leakage from flooding in Zone 10 of the weld channel and penetration pressurization system. Although Con Edison had known the Zone 10 leakage problems were a long-standing degraded condition – resulting in the zone being retired in 1995 when it was deemed irreparable – *the effect on the material condition of the containment liner had gone undetected.*

INSPECTION REPORT 05000247/2000-001 (4/13/00): There was a large total backlog of uncompleted post maintenance tests (PMTs) for equipment returned back to service. Approximately 130 PMTs were outstanding, 10% of which would require a refueling outage to accomplish. Most of the outstanding PMTs were about 2 years old, with the oldest being October, 1995. About 37% of the backlog was related either to safety-significant, important-to-safety, or risk significant components. Inspector review of the backlog noted numerous examples where documentation did not exist to conclude that the safety-related component could perform its intended safety function. Although Con Edison has planned improvements to its work control and test plans since 1997 (including one originally to be implemented in October 2000*) inspectors noted that none of Con Edison's plans precluded a large backlog of PMTs for safety-related equipment.* The failure to complete post-maintenance testing is considered a violation of NRC requirements as described in Technical Specification 6.8.1 **(NCV 05000247/2000-001-01)**.

INSPECTION REPORT 05000247/2000-001: The results of a June 1999 irradiated fuel pool analysis indicated Con Edison is in violation of its licensing and design basis. The spent fuel storage racks at Indian Point Unit 2 use boraflex as a neutron absorber material to control the reactivity levels in the irradiated fuel pool, expressed as the neutron effective multiplication factor (or Keff). Operating experience has shown that the boraflex material can degrade after long term exposure to radiation. Con Edison has developed a model to estimate the loss of boraflex in each panel of the fuel racks, and results of the June '99 analysis indicated that Keff in the irradiated fuel pool racks is greater than the limit of 0.95 established by Technical Specification 5.4.2.B **(UNR 05000247/2000-001-02)**. *This degraded condition potentially compromises the ability of Con Edison to prevent a criticality accident in the fuel pool.*

INSPECTION REPORTS 05000245/1999-013 and 05000247/2000-001 9/06/99
Housekeeping. Con Ed initiated action to address conditions in Unit 1 relative to rain water leaking onto the Unit 1 fuel handling floor and potentially affecting contamination control of the area.

INSPECTION REPORT: 05000247/2000-002: During the February event operators lost condenser vacuum *due to a long standing material deficiency*. Operators reported that the SJAE steam supply pressure regulator had never worked properly. In addition, operators

attempted to refill the IVSWS tank. The tank inventory unexpectedly drained into the CCW system and operators could not maintain IVSWS tank level. IVSWS was declared inoperable. *There was a similar problem in 1997 with the IVSWS caused either by a longstanding deficiency or a system design problem that had not been corrected.*

The #22 condenser vacuum pump tripped due to thermal overload and the condenser vacuum was lost. *The #22 condenser vacuum pump was degraded prior to the event due to thermal overload problems which had not been repaired since identified in 1997.* The degraded equipment reduced reliability of the condenser as a heat sink to cool down the RCS.

In **Attachment # 3** IP2 Steam Generator Tube Leak Event (2/15/00) Summary of Selected Equipment Problems are included: 1) Pressurizer pressure master controller did not control (close) automatic (CR 2000-1137) 2) Condenser vacuum was lost two times which required operators to use the #21-23 steam generator atmospheric steam dump valves for cooldown. This was attributed to longstanding equipment problems, which included the steam jet air ejector, steam supply regulator was inoperable, and #22 condenser vacuum pump tripped on a thermal overload condition (CR-2000-0984). 3) the Reactor Coolant System overpressure protection system was inoperable due to inadequate nitrogen supply to pressure operated relief valve. 4) The isolation valve seal water system tank level was lost. Operators refilled the tank; it unexpectedly emptied. This condition was a repeat problem of a 1997 longstanding design deficiency. 5) 10 safeguards and containment isolation valve position indication lights in the control room failed to illuminate. 6) The SJAE discharge isolation valve was slow to close. 7) The excess letdown CCW isolation valve 793 position indication light repeatedly blew fuses. (CR 2000-1023) 8) The auxiliary feedwater pump room heated up to approximately 80 degrees F. Station personnel had inadvertently placed wooden planks over the pump room fresh air inlet ventilation dampers. 9) Reuter-Stokes off-site telemeter radiation monitor system didn't provide normal display output during the event. This appeared to be a repeat longstanding degraded material condition which reduced off-site dose assessment capabilities.

4. Worker Safety and ALARA Standards

INSPECTION REPORT 05000247/2000-003 (5/16/00): On April 20, 2000, the inspector observed inattentive steam generator repair and health physics workers inside the vapor containment. The inspector spoke with the workers and discussed the issue with Con Ed personnel. Although it was later determined that no significant exposures occurred, the area inside containment where the workers were inattentive was posted as a high radiation area.

5. Emergency Preparedness

Con Edison has demonstrated a long-standing inability to protect the public during nuclear emergencies and accidents through the failure of its emergency preparedness and operations program. During both of the recent site emergencies when Con Edison was required to initiate emergency operations and activate its Emergency Operations Center, Con Edison failed to follow or meet NRC regulations and to adequately and accurately inform the public and local officials of dangers to the public health and safety. Augmented Inspection Team inspections following each emergency identified numerous equipment failures, procedural errors, and inadequate performance – many of them the same in both instances. Following the October 1999 restart the licensee promised to make improvements in this area; however, the extent of systemic mismanagement at Indian Point 2 prevented Con Edison from making any substantial improvements prior to the next emergency on February 15, 2000.

Between May 15-June 2, 2000, NRC conducted a baseline inspection of Con Edison's emergency preparedness operations and followed up on the Augmented Inspection Team report findings (0500047/2000-002). The report documented numerous violations of NRC regulations, including three that were categorized as "White" under the NRC's new significance determination process.

INSPECTION REPORT 05000247/2000-006 (7/14/00): In response to the Alert of February 15, 2000, there was a failure to augment the Emergency Response Organization (ERO) within 60 minutes of the declaration of the Alert contrary to the Indian Point 2 E-Plan Figure 5.2-1. Some facilities were not staffed until 3 to 3.5 hours after the declaration. Followup inspection identified several program structure deficiencies or design problems that prevented or delayed ERO staff's ability to respond, an apparent failure to meet NRC emergency planning standard 10 CFR 50.47(b)(2) **(AV 05000247/2000-006-01)**. During the June 2 exercise, Con Edison still experienced problems with pagers and the Community Alert Notification System. The finding from the February 15 event was later determined (8/9/00) to be a violation of low to moderate safety significance because of the failure to meet an NRC emergency planning standard.

INSPECTION REPORT 05000247/2000-006: Con Edison's response to the Alert of February 15, 2000, compromised worker safety by failing to account for onsite radiation workers within 30 minutes of initiation and not providing workers with consistent and accurate instructions and training on accountability procedures following an emergency declaration, contrary to the IP2 E-Plan section 6.4.1.d and E-Plan implementing procedure 1027 section 5.12.f. Followup inspection further identified several program deficiencies or design problems indicating an apparent failure to meet NRC emergency planning standard 10 CFR 50.47(b)(10) concerning accountability **(AV 05000247/2000-006-02)**. This finding was later determined (8/9/00) to be a violation of low to moderate safety significance because of the failure to meet an NRC emergency planning standard.

INSPECTION REPORT 05000247/2000-006: In response to the Alert of February 15, 2000, there was a failure to properly disseminate information about the Alert conditions. As a result there was confusion in the public domain about whether there was a radiation release and its magnitude, and one local official was not notified in accordance with a pre-arranged agreement. This was contrary to the IP2 E-Plan section 5.2.3, which requires consistent information be disseminated. Followup inspection identified a number of program structure or design problems indicating an apparent failure to meet NRC emergency planning standard 10 CFR 50.47(b)(7) concerning dissemination of information **(AV 05000247/2000-006-03)**. This finding was later determined (8/9/00) to be a violation of low to moderate safety significance because of the failure to meet an NRC emergency planning standard.

INSPECTION REPORT 05000247/2000-006: The NRC identified a decrease in the effectiveness of the E-Plan because descriptions of some onsite ERO positions and the training program had been removed from the E-Plan. This finding was treated as a non-cited violation of 10 CFR 50.54(q) consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-04)**.

INSPECTION REPORT 05000247/2000-006: The NRC identified that there was an inadequate description in the E-Plan of the join news center (JNC) facilities and staff responsibilities and of the siren testing equipment used to verify siren operability. This finding was treated as a non-cited violation of 10 CFR 50 Appendix E requirements consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-05)**.

INSPECTION REPORT 05000247/2000-006: The NRC identified the failure to correct ERO notification deficiencies found as a result of drills or exercises as early as November 1999. Problems with the notification process still existed as demonstrated during the event of February 15, 2000, and as late as June 1, 2000, as evidenced by equipment reliability problems and inconsistent activation by assigned personnel. This finding was treated as a non-cited violation of 10 CFR 50.47(b)(14) consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-06)**.

INSPECTION REPORT 05000247/2000-006: The licensee identified that they had not conducted an off-hours exercise at the required frequency. E-Plan Section 8.1.3, Drills and Exercises, commits the licensee to conduct an off-hours exercise once every six years. Prior to the February 15, 2000, event, the last off-hours exercise was conducted in 1993 and thus exceeded the six-year periodicity. This finding was treated as a non-cited violation of 10 CFR 50.54(q) consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-07)**.

INSPECTION REPORT 05000247/2000-006: During the February 15, 2000, event the licensee's failure to activate the Emergency Response Data System (ERDS) within one hour of the Alert was contrary to 10 CFR 50.72(a)(4). The ERDS was not made operable until approximately seven and one-half hours after the Alert declaration due to a problem with the telephone lines *which Con Edison had previously identified, but not corrected.* This finding was treated as a non-cited violation of 10 CRR 50.72(a)(4) consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-08)**.

INSPECTION REPORT 05000247/2000-006: The licensee failed to establish a continuous communication line as requested by NRC. 10 CFR 50.72(c)(3) requires that during emergencies licensees maintain an open, continuous communication channel with the NRC Operations Center upon request by the NRC. The finding was treated as a non-cited violation of 50.72(c)(3) consistent with the Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65 FR 25368) **(NCV 05000247/2000-006-09)**.

INSPECTION REPORT 05000247/2000-006: During the June 1, 2000, exercise, there continued to be weaknesses in dissemination of information. For instance, the Joint News Center did not receive detailed information regarding plant and radiological conditions from the EOF and that lack of information resulted in the JNC staff having little understanding of the emergency (condition of the reactor and containment, offsite radiological conditions). Consequently, briefings and press releases were inconsistent and contained incorrect information. Furthermore, during the June 2 exit meeting, *the licensee's critique of the exercise demonstrated Con Edison's continued inability to accurately and thoroughly self-assess in safety-significant situations.* The licensee failed to identify a number of Emergency Response Facility problems, including one that repeated a violation of safe shutdown regulations from the February 15 event: reactor vessel cooldown rates exceeded the Technical Specification limit of 100 degrees F per hour.

INSPECTION REPORT: 05000247/2000-002: ConEd emergency facilities were not activated in a timely fashion (100 minutes) because: 1) emergency response pagers were not activated by the corporate information group for about 20 minutes; 2) the automated telephone notification system was not activated until 50 minutes because the recorded event message was incorrect; 3) there was confusion at the security guard house as to where to send responders for accountability and assignment; 4) activation of the operations support center was delayed due to licensee's decision to move the facility to another location.

The inconsistent understanding between ERO managers of the requirements for declaring the accountability was complete. Section 8.1.3, Drills and Exercises of the E-Plan committed the licensee to conduct an "off hours" exercise every 6 years. *The last exercise was in fact conducted in 1993 and did not meet the requirements.*

During the Alert declaration security personnel secured the main entrance. Security manager determined that the IP3 access gate was not guarded until midnight and not locked until 3:00 AM.

In addition there were equipment problems that confounded the situation: 1) The removal of two computers information displays from the TSC apparently caused initial confusion among the technical staff personnel who reported having difficulty accessing real-time operating data. This contributed to the delay fir the initial estimate of the 24 steam generator tube leak; 2) The emergency Response Data system was not operable until 3:00 AM. Licensee is required to test the system under 10 CFR 50 Appendix E.IV to test the system quarterly. The tests for first quarter 2000 were unsuccessful due to noise on the phone line. Test was successful when an alternative phone line was utilized. However the ERDS was then placed back on the line that didn't work. 3) 10 CFR 50.72(B)(c)3 requires that licensee maintain an open, continuous communication channel with NRC operations center. At 7:00 PM NRC formally requested the communication channel; the licensee did not establish this channel in a timely manner (2 hours later).

Other Problems with the ERO: 1) The ERO technical staff in the TSC did not anticipate and help resolve the procedural, and plant configuration problems without delaying the plant cooldown and depressurization. 2) ERO technical support should have been aware of the longstanding use of the manual bypass valve to control the steam supply pressure to the main condenser SJAE. 3) ERO technical support staff in the EOF did not properly resolve two discrepant radiological survey readings that were reportedly taken external to the #24 ASDV tailpipe until challenged by NRC to take more samples. 4) Lack of adequate communication to the control room of primary boron concentration samples, which delayed initiation of the RCS cooldown 5) lack of recommendations to secure the release path for the plant vent. 6) ERO staff were slow to complete the pinning of the main steam lines to protect against a possible challenge to the lines from overfilling the #24SG.

The Media Relations Emergency Response Plan poorly described the delegation of assignments, position responsibilities, time requirements for contacting off-site officials, and training requirements. *Oversight of the ENC was weak and failed to ensure that E-Plan commitments would be met.*

Problems encountered during a September 1999 emergency exercise which identified several performance weaknesses, we repeated during the February event.

6. Steam Generator Integrity Inspections & Monitoring

The NRC has acknowledged Con Edison's failure to adequately monitor material degradation of the steam generators and conduct preventative maintenance as a root cause of the February 15 event. As noted, NRC acted aggressively to address the steam generator problem at Indian Point Unit 2. This led Con Edison to replace its steam generators; however, Con Edison disagrees with NRC staff's conclusions and judgements in regard to the seriousness of the event and the "RED" significance determination. In addition, Con Edison disagrees with NRC that it violated regulations for monitoring the steam generators and assuring the health and safety of the workers and the public. In lieu of the licensee's acknowledgement of faulty judgement, petitioners believe Con Edison fundamentally lacks the ability to self-assess and determine root causes for its actions, and cannot

interpret accurately and implement all regulatory and licensing requirements. The licensee either does not appear to sufficiently understand NRC regulations and industry guidelines, or has willfully violated them judging them to be mere formalities. Furthermore, the nature of the violations involved in the steam generator tube failure and inspection violations reflect symptoms of the systemic mismanagement referenced in this petition.

Con Edison's Cost/Benefit Analysis Compromises Safety

According to an October 16, 1997 internal planning document titled "Indian Point 2 Financial Analysis" (see attachment), Con Edison financial planners concluded that replacing the reactor's four Westinghouse Model 44 (W/44) steam generators in a timely manner was the cheapest option for customers and shareholders. Their analysis noted that the generators were deteriorating -- a common occurrence with W/44 steam generators -- limiting how much electricity they could produce. And if the W/44 generators were not replaced, they would require increased inspected, cutting the number of days the plant could run, according to the planners' document.

However, Con Edison rejected the final planners' recommendations and chose not to replace the steam generators because the licensee was uncertain whether replacement was a good financial decision in the deregulated market that was developing. Petitioners believe this decision to delay replacement of the deteriorating steam generators demonstrates Con Edison's choice to value revenue over the health and safety of the public and plant personnel. This conflict of interest between the licensee's financial concerns and nuclear safety requires an NRC investigation to determine its impact on safety and regulatory compliance at IP2 and whether Con Edison willfully violated NRC regulatory requirements. This information raises generic concerns about the potential for compromised health and safety in a deregulated electric utility market.

The Con Edison analysis compared three options for the reactor: replacing the steam generators and running the plant until its license expired in 2013; not replacing the generators and running the plant until 2013, but at a lower power level and with an extra shutdown every year for inspections, (averaging 30 to 36 days); or retiring the station in 1999 or 2001. The first option was judged the least expensive. Con Edison projected that replacing the steam generators would cost $121 million, not including the cost of the equipment itself. The licensee figured that the cost of running the station until license expiration in 2013 was $1.52 billion; shutting it down in 1999 would cost $59 million more, including replacement power costs, but replacing the steam generators would save $85 million.

However, Con Edison's October 1997 analysis pointed out that these financial projections were highly sensitive to the price of electricity and that postponing a decision would give the company an opportunity to refine its estimates as New York State made its transition to a deregulated electricity market. In an interview with the *New York Times* (June 30th article written by Matt Wald) regarding the October 1997 analysis, Con Edison Vice President Steven E. Quinn said that the benefit projected for replacing the steam generators -- $85 million over 14 years -- was too small to justify the financial risk, because "the uncertainty on the assumptions was large." Among the uncertainties, of greatest concern was the future market price for electricity. According to King Look, a section manager in Con Edison's generation planning department and one of the authors of the October 1997 document, the problem was that the financial projections were highly sensitive to electricity prices, and that no one knew how those prices would run in a deregulated market.

FINAL SIGNIFICANCE DETERMINATION FOR A RED FINDING AND NOTICE OF VIOLATION AT INDIAN POINT 2 (11/20/00 -- SUPPLEMENT TO INSPECTION REPORT 05000247/2000-010):
Contrary to 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," Con Edison did not fully

identify and correct a significant condition compromising safety, despite opportunities during the 1997 refueling outage. In conducting the 1997 steam generator inservice inspection, Con Edison did not adequately account for conditions that adversely affected the delectability of, and increased susceptibility to, tube flaws. Specifically, Con Ed did not: (1) take appropriate corrective actions following identification, for the first time, of a significant tube degradation mechanism; (2) appropriately establish procedures and implement practices to address the potential for tube cracks at the upper tube support plate flow slots; and (3) recognize the significance of, and fully evaluate, the flaw masking effects of the high noise encountered in the Eddy Current Test signal, particularly when conditions that increase susceptibility to tube degradation existed. As a result, a minimum of four tubes (with PWSCC flaws in their small radius U-bends) were left in service following the inspection, until the failure of one of those tubes on February 15, 2000 while the reactor was at 100% power. Con Edison is being cited with a violation of 10 CFR 50, Appendix B, Criterion XVI.

FINAL SIGNIFICANCE DETERMINATION AND NOTICE OF VIOLATION: Staff evaluation of the licensee's revised risk analysis revealed: (1) that Con Edison relied on non-conservative assumptions about the impact of human error; and (2) that Con Edison used an inappropriate analytical model for estimating the frequency of tube breaks.

INSPECTION REPORT 05000247/2000-010: The team identified two instances in the 1997 inspection in which Con Edison violated the EPRI Guidelines requirements for using the Plus Point probe: failure to properly calibrate the probe; and the required phase rotation set-up was not used, and the instructions provided no guidance to analysis. On these bases, the team found that Con Edison did not conduct the 1997 SG low radius U-bend inspections in accordance with Technical Specification NPE72217, which specified th use of an EPRI-qualified technique for SG inspections, a violation of 10 CFR 50, Criterion IX, Special Processes for ECT inspection **(NCV 05000247/2000-010-01)**.

INSPECTION REPORT 05000247/2000-010: Con Edison did not adequately document the Eddy Current Test (ECT) analyst training and testing information, an indicator that Con Edison did not follow the Electric Power Research Institute (EPRI) Guidelines. Specifically, the reviewed information was not indicative of the establishment of strict rules relative to preparation, maintenance, and updating of the site-specific performance demonstration. As evidenced by the delay in obtaining records, the degree of involvement of Con Edison in the process for training and testing of ECT analysts was in question. There were other areas of the inspection in which Con Edison failed to provide adequate guidance to collect and analyze data from the inspection, including data analysis guidance for use of the U-bend mid-range Plus Point probe. This pattern indicates a potential failure of Con Edison to ensure adequate training of contract personnel and sufficiently plan for safety significant refueling outage activities.

INSPECTION REPORT 05000247/2000-010: The inspection team observed that Con Edison's root cause analysis did not identify and address the SG program performance issues identified above in Section 1R2 and 1R3 as they related to the SGTF on February 15, 2000. While Con Edison's root cause analysis attributed the failure to a flaw that was obscured by ECT signal noise, it did not identify, or address, deficiencies in the processes and practices during the 1997 SG inspection. This failure indicates Con Edison management's tendency to deal with problems in a narrow, case-by-case fashion, rather than identify the deeper performance issues that would prevent recurrence or the evolution of new problems other areas.

7) **Disregard of NRC Communications leading up to the February 15, 2000 Steam Generator Tube Rupture Accident**

EVENT INQUIRY BY THE OFFICE OF INSPECTOR GENERAL, U.S. NUCLEAR REGULATORY COMMISSION, "NRC'S RESPONSE TO THE FEBRUARY 15, 2000 STEAM TUBE RUPTURE AT INDIAN POINT UNIT 2 POWER PLANT," CASE NO. 00-03S, AUGUST 29, 2000

The Office of the Inspector General determined that the NRC and Indian Point Unit 2 senior management were aware of and had identified these long-standing concerns about the loss of integrity of steam generator tubes due to many age-related degradation mechanisms leading up to the tube rupture accident.

These safety concerns have been repeatedly communicated and elaborated upon through supplemental communications between the regulator and Indian Point Unit 2 management as documented in the OIG Event Inquiry to include:

--August 6, 1990, NRC Information Notice 90-49, "Stress Corrosion Cracking In PWR Steam Generator Tubes," informing licensees of recent problems involving stress corrosion cracking in pressurized water reactor steam generator tubes.

--April 30, 1994, NRC Information Notice 94-62, "Operating Experience on Steam Generator Tube Leaks and Tube Ruptures," to inform licensees of recent operation experience with steam generator tube leaks and tube ruptures.

--April 23, 1995, NRC Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes," alerting licensees about the importance of performing comprehensive examinations of steam generator tubes using appropriate inspection techniques and equipment capable of detecting degradation.

--September 20, 1995, NRC Information Notice 95-40, "Supplement Information to Generic Letter 95-03, 'Circumferential Cracking of Steam Generator Tubes," discussing steam generator tube examination results from Maine Yankee Atomic Power Plant.

--April, 1996, Idaho National Engineering Laboratory study prepared for NRC (NUREG-CR-6365), "Steam Generator Tube Failures," communicating information on steam generator tube failures and the impacts of these failures on plant and public safety including the increased risk significance of the government analysis showing that if more than 15 tubes rupture during a main steam line break, the system response could lead to the reactor core melting with the simultaneous by-pass of the reactor containment structure. The report highlights the continuing issue as to what constitutes an appropriate and timely inspection of steam generators and which degraded tubes are still fit for service.

--June 21, 1996, NRC Information Notice 96-36, "Results of Steam Generator Tube Examinations," informed licensees of PWRs about current results of steam generator examinations and the importance of controlling and optimizing test variables such as probe design and frequencies for inner diameter versus outer diameter tube wall cracking.

--May 19, 1997, NRC Information Notice 97-26, "Degradation in Small-Radius U-Bend Regions of Steam Generator Tubes," informing licensees about recent degradation affecting the small radius U-Bend regions of tubes in recirculating steam generators.

--July 8, 1997, NRC Office of Public Affairs issued "Technical Issues Papers and Fact Sheets: Steam Generator Tube Issues" focusing further attention on the significance of steam generator tube integrity.

--December 16, 1997, NRC Information Notice 97-88, "Experiences During Recent Steam Generator Inspections," informing licensees of findings from recent inspections of steam generator tubes.

--July 24, 1998, NRC Information Notice 98-27, "Steam Generator Tube End Cracking," informing licensees of instances of steam generator tube end cracking.

--December 1998, NRC Draft Regulatory Guide DG-1074, "Steam Generator Tube Integrity," providing licensees with guidance about steam generator tube integrity.

It is significant to the Petitioners' call for the revocation of Con Edison's operating license that long identified degradation problems, extensively monitored and cited by NRC communications, resulted in seven other reactor operators replacing their Westinghouse Model 44 steam generators (identified as the most susceptible model to age-related degradation) between 1982 and 1996. Contrary to these industry corrective action programs and all of the above guidance provided by the NRC to protect the public health and safety, only IP2 senior management deliberately chose to continue operation of their reactor with deteriorating Westinghouse Model 44 steam generators up to the point of steam generator tube failure of February 15, 2000.

It is significant to the Petitioners' call for license revocation that Con Edison disregarded and/or mismanaged technical guidance contained in these NRC communications. The OIG inquiry documents that despite the well documented knowledge of extensive ongoing degradation of safety-related equipment, Con Edison senior management sought a license amendment from the power reactor's technical specifications requiring steam generator tube inspections every 24 months, deferring the June 1999 inspection to June, 2000 resulting in the February 2000 tube rupture accident. While the NRC granted the license amendment deferring the mid-cycle inspection, the agency's information was based on data provided by Con Edison later deemed to be faulty crack growth rates and a majority of tube defects missed during the 1997 inspection due to inappropriate use of testing equipment, procedures and inferior analysis; information and guidance provided to Con Edison in the previous NRC communications. In addition to Con Edison's poor performance, the OIG concluded the NRC could have provided more oversight of the Con Edison steam generator inspections and that NRC should have also have reviewed the Con Ed 1997 inspection report. With the 1997 inspection and the opportunity that would have been provided by inspection in 1999 they might have recognized the indications of the tube that ruptured in February 2000.

The OIG Event Inquiry further concluded that NRC is aware that Indian Point 2 has an extensive history of broad poor performance issues resulting in the Region 1 enhanced senior management regulatory oversight. These performance issues include corrective action program performance problems, work control problems, and lapses in engineering support, the buildup of equipment deficiencies and loss of IP2 focus on their improvement plan.

Therefore, the undersigned individuals and organizations petition the NRC to take the aforementioned actions at Indian Point Unit 2 to protect the public health and safety.

ABOUT THE PETITIONERS

Citizens Awareness Network (CAN) is a non-profit, public interest group with members located in proximity to the Yankee Rowe reactor in MA, the Vermont reactor in VT, the Connecticut Yankee

reactor in CT, the Seabrook reactor in NH, the Nine Mile Point, FitzPatrick, and Ginna reactors in Central New York, and the Indian Point reactors in downstate New York. We are concerned with the entire nuclear fuel cycle from the mining of uranium, the standard operation of nuclear power stations to the siting of rad-waste facilities. We represent many impacted communities. We have participated in NRC actions including hearings on reactor embrittlement and decommissioning, rulemakings, workshops, and adjudicatory hearings since 1991.

Nuclear Information and Resource Service (NIRS) is a nonprofit organization whose work is related to nuclear power, radioactive waste, and renewable energy. NIRS membership is nationwide including New York residents whose health and safety is prioritized by the requested actions in this petition. With an office in Washington, DC, NIRS has been a participant in nuclear regulatory affairs, including rulemakings, enforcement actions, and adjudications involving individual nuclear power stations since 1978.

Westchester Peoples Action Coalition is a 26-year old peace, social justice and environmental organization, which works on international, national, statewide and local issues. We represent the voice of over 5,000 residents of the Westchester County area. Based in White Plains, New York, WESPAC has been working to inform the public about the dangers of nuclear power in general and the Indian Point nuclear power plants in specific since our inception.

Environmental Advocates (EA) is a 501 (c)(3) statewide nonprofit organization serving the people of New York as an effective and aggressive watchdog and advocate on virtually every important state environmental issues. Through advocacy, coalition-building, citizen education and policy development, EA works to protect the environment and safeguard public health.

Public Citizen: Public Citizen's Critical Mass Energy & Environment Program was founded by Ralph Nader in 1974 to represent the safe energy movement in Washington, DC. The organization has a long history of fighting and watch dogging the nuclear industry and advocating for sustainable energy policies. As the eyes and ears in Washington, DC of the progressive energy advocacy community, Critical Mass has worked closely with activists throughout the country over the past twenty-four years.

The Critical Mass Energy & Environment Program was formed 1974 to fight the nuclear power industry's efforts to construct nuclear reactors across the country. Since that time, Critical Mass has been a strong voice for a more rational energy policy. We advocate a phase out of nuclear reactors and support replacing them with cleaner, safer, renewable forms of electric generation.

V CONCLUSION:

For the foregoing reasons, petitioners ask the United States Nuclear Regulatory Commission to grant the petition by immediately commencing enforcement action, as detailed above, against Con Edison.

Dated: This 6th Day of December 2000.

Respectfully Submitted,

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Attachment

Indian Point 2 Financial Analysis

October 16, 1997

Indian Point 2 Financial Analysis

Team Members:

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Treasury: J. Hirst

Planning: K. Look

Outline

- Today's Objective
- Analytical Approach
- Major Assumptions
- Results
- Issues
- Observations

Today's Objective

To present the economics of:

- **Continued operation** through 2013, with existing steam generators (SG) maintained
- **Planned shutdown** in 1999 or 2001
- **Planned Steam Generator (SG) replacement** in 1999 or 2001, with continued operation through 2013

Analytical Approach

- Full cost model excluding sunk costs
- Incremental revenues from SG replacement netted against costs
- "Base Case" analysis:
  - Planned shutdown/SG replacement: 1999
  - Plant availability (between outages): 95%on average
  - Additional outage days, plus mid-cycle outages of 30-36 days every other year starting in 2000
- Alternative / Sensitivities:
  - Planned shutdown/SG replacement: 2001
  - +/-10% market price
  - No property tax savings with shutdown
  - Plant availability (between outages): 90% on average
  - No mid-cycle outages

Major Assumptions ~ Common Among All Scenarios

- Cost projections provided or confirmed by other departments
- Corporate support data based on specific nuclear support identified by area, not by allocation
- 35.9% fringe benefits and insurance
- 9.5% weighted average cost of capital
- Replacement power (capacity and energy) at market price
- License renewal not considered
- Technical issues regarding structural integrity not considered

Major Assumptions ~ Specific To Continued Operation

- Additional SG repair costs
- Additional refueling outage days
- Mid-cycle outages of 30-36 days starting in 2000
- Replacement power costs recovered through Fuel Adjustment Clause under EPS analysis

Major Assumptions ~ Specific To Planned SG Replacement

- $121 million to install SG in 1999, not including cost of SG
- Incremental revenues due to increased generation (30 MW) after replacement are market priced
- $12 million one-time decommissioning cost added in the year of replacement
- Short-term energy costs and revenues pass through the Fuel Adjustment Clause for EPS analysis

Results ~ Base Case and Timing Alternative

(In $ Millions)

NPV Cash Flow of Costs

Year of Shutdown/SG Replace:	1999	"Base Case"	2001
◆ **Continued operation** through 2013 with existing SG maintained		1,521	1,521
◆ **Planned shutdown**	+ 59		+ 49
◆ **Planned SG replacement**, with continued operation through 2013		- 85	- 67

Results ~ Sensitivities

(In $ Millions)

NPV Cash Flow of Costs

	Base Case	+ 10% Price	-10% Price	Full Taxes	90% Avail.	No Mid-cycle Outages
◆ **Continued operation** through 2013, with existing SG maintained	1,521	1,535	1,507	1,521	1,512	1,442
◆ **Planned shutdown** in 1999	+ 59	+ 152	- 35	+ 135	- 3	+ 138
◆ **Planned SG replacement** in 1999, with continued operation through 2013	- 85	- 91	- 79	- 85	- 76	+ 15

Results ~

EPS Impact Of SG Replacement In 1999

	1999	2000	2001	2002	2003
Replace vs. Operate:					
◆ Additional financing	(.02)	(.03)	(.03)	(.03)	(.02)
◆ Additional depreciation	(.03)	(.03)	(.03)	(.03)	(.03)
◆ Avoided outage/mid-cycle costs	-	.03	.01	.03	.01
◆ Incremental revenues	N/A	N/A	N/A	.07	.05
◆ PPFAC (penalty) or avoidance (A)	(.03)	.01	N/A	N/A	N/A
◆ Total (B)	(.08)	(.02)	(.05)	.04	.01

(A) Assumes maximum annual PPFAC penalty.

(B) Total EPS 1999 through 2013 equals +.64.

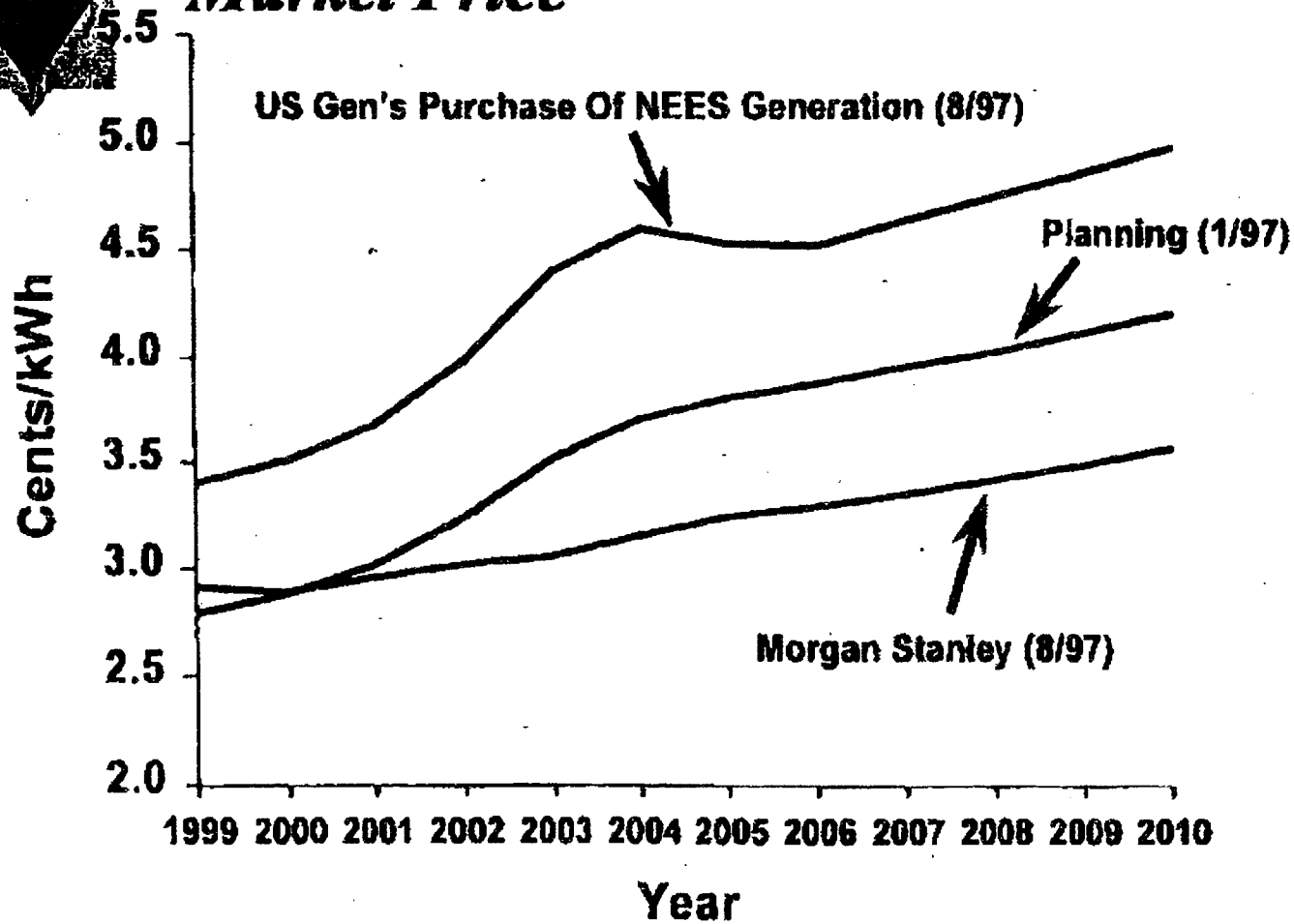
Note: Under the **Shutdown** scenario, EPS would most likely be unaffected during the five-year transition period. The company would petition the PSC for cost recovery of the unrecovered plant investment, reduced by any savings as a result of plant shutdown.

Results ~ Break-even Analysis

	(In $ Millions) NPV Cash Flow of Costs Base Case
◆ **Continued operation** through 2013 with existing SG maintained	1,521
◆ **Planned SG replacement** in 1999, with continued operation through 2013	- 85 (A)

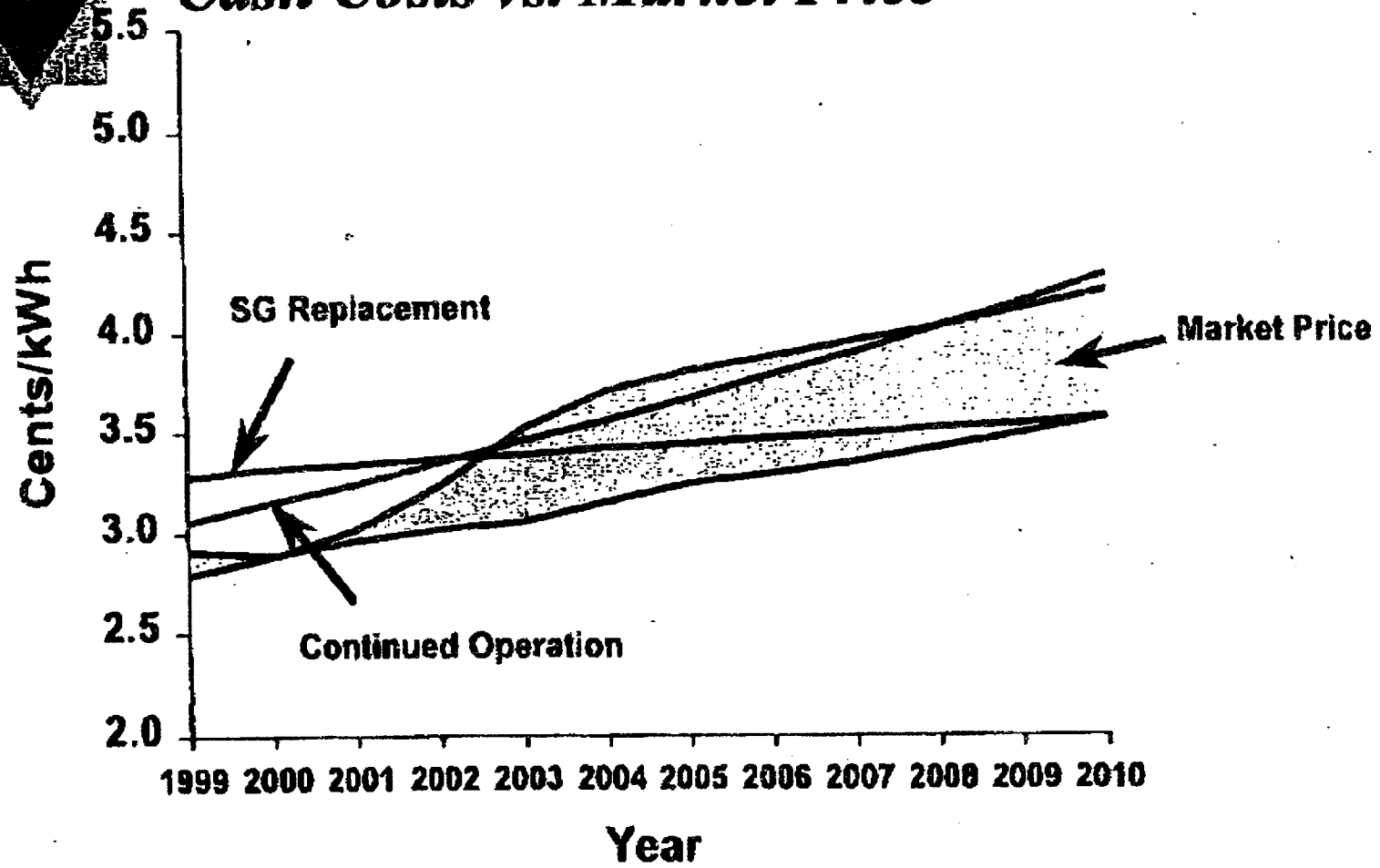
(A) Equivalent to 285 outage days in addition to the 120 days already in the base case for SG replacement, or a total of 405 days.

Results ~ Market Price



Results ~

Cash Costs vs. Market Price



Issues ~ Financial and Technical

	Operate	Shutdown	Replace
License renewal			+
MW stretch prior to SG replace			+
Additional MW output when replace			+
Additional MW due to uprating the unit			+
Higher market price of power	+	-	+
Additional outage days & mid-cycles	-	+	+
Higher SG replacement cost			-
Uncertainty about nuclear issues	+	-	regulatory -
NRC scrutiny	-		
Unplanned shutdown due to SG failure	-		
Uncertainty of decommissioning early		-	
Uncertainty of PSC allowing for recovery of sunk costs if shutdown		-	

Issues ~ Settlement Agreement

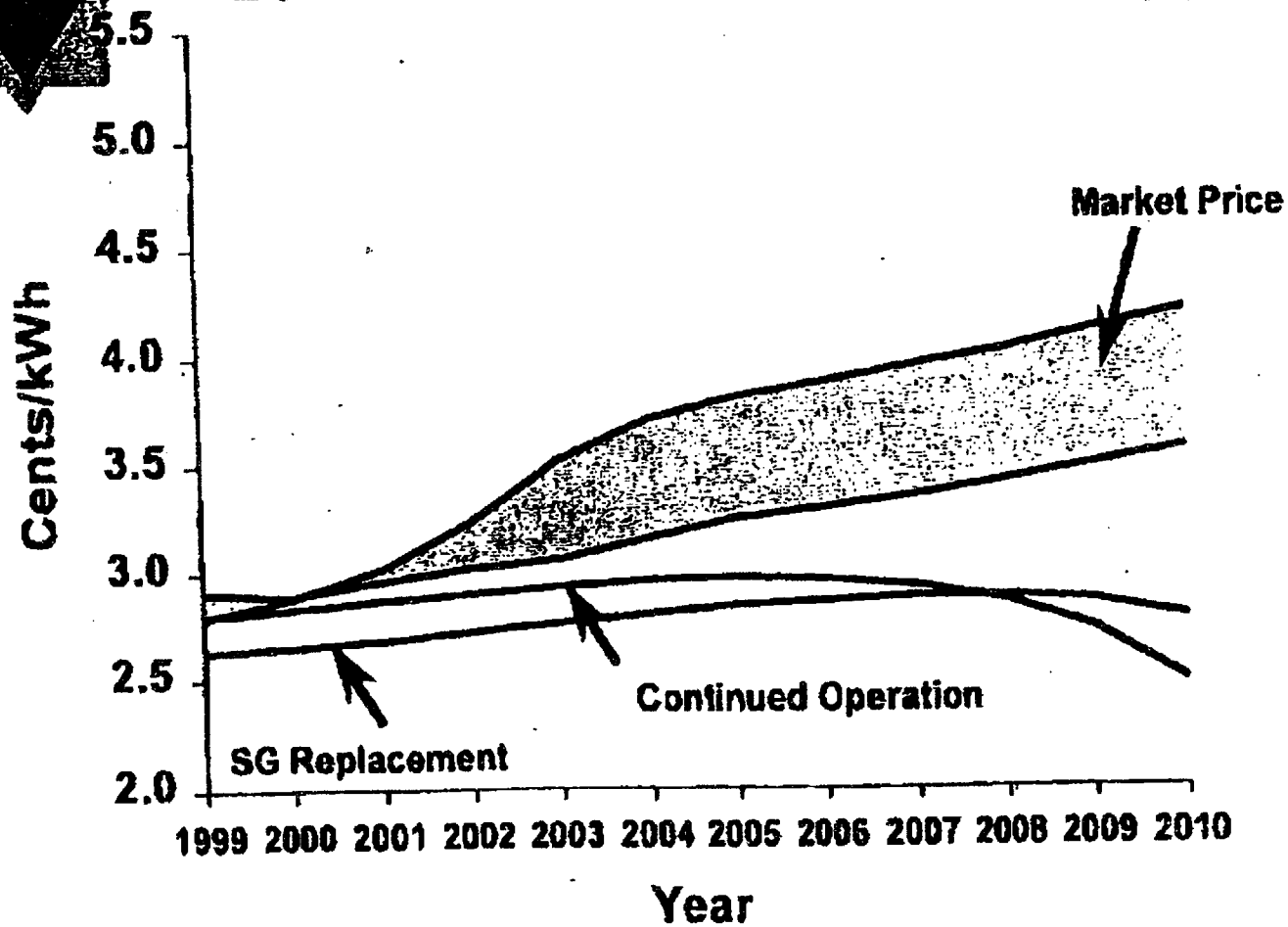
- Indian Point to remain a regulated asset
- Cost recovery through no later than 2013
- Decommissioning cost reconciliation and recovery after 2013
- Submittal of "To Go" cost procedure to PSC staff by June 1, 1998

Issues ~

PSC Staff's Nuclear White Paper

- Preference for sale of plant to third party via auction process
  - PSC concern with vertical market power
  - Potential decoupling of operational and decommissioning obligations
- Administrative valuation as alternate to plant sale
  - "To Go" costs defined as costs that would be reduced or avoided by permanent plant shutdown
  - "To Go" costs must be recovered in wholesale market price
- Post-transition period: nuclear plants should operate on a competitive basis

Results ~ "To Go" Costs vs. Market Price (1)



Note 1: "To Go" costs shown are net of the cash costs under shutdown.

Observations

- Financial study is sensitive to likelihood of mid-cycle outages and market price.
- Financial results should be used in combination with technical data in order to determine whether or not to replace the SG.
- Continued operation is viable based on "to go" costs less than current estimated market prices.
- SG replacement is the least cost alternative, followed by continued operation, then shutdown.
- 405 total outage days are available to accommodate unplanned SG replacement in 1999 to break-even with continued operation.
- SG replacement in 2001 would provide for more current information on issues (competitive opportunities, market price) and for SG preparatory work during the 1999 outage.

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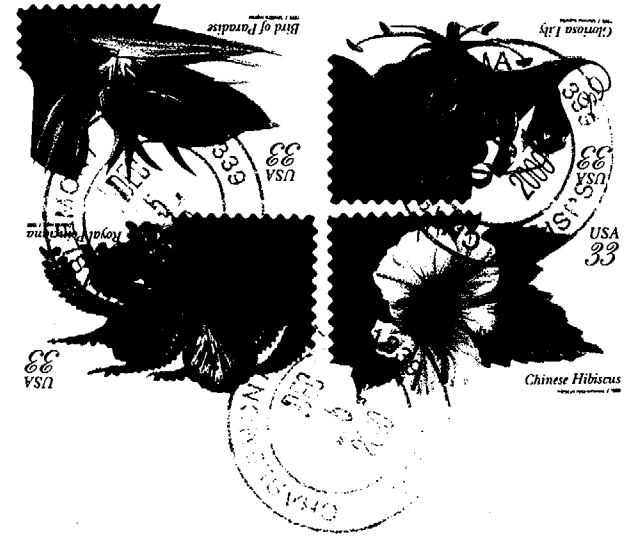

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