December 4, 2000

Mr. A. Alan Blind
Vice President - Nuclear Power
Consolidated Edison Company of New York, Inc.
Indian Point 2 Station
Broadway and Bleakley Avenue
Buchanan, NY 10511

SUBJECT: INDIAN POINT UNIT 2 - NRC INSPECTION REPORT NO. 50-247/00-012

Dear Mr. Blind:

On October 20, 2000, the NRC completed a team inspection at the Indian Point Unit 2 Nuclear Power Plant. The enclosed report documents the inspection findings which were discussed on November 16, 2000, with Mr. Groth, you, and members of your staff.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations and the conditions of your operating license. Within these areas, the inspection involved selected examinations of procedures and representative records, observations of activities, and interviews with personnel.

Con Edison has made progress in reducing the backlog of open evaluations and corrective actions within the overall corrective action program (CAP). However, on the basis of the sample selected for review, the team identified CAP performance issues and findings that revealed some continuing weaknesses in the initiation of condition reports for identified issues, in the significance classification and prioritization of problem evaluations, and in the prioritization of corrective action tasks. We understand that you recognize these weaknesses and that you are implementing corrective actions through your Business Plan.

The team identified nine Green (very low risk significant) inspection findings, in accordance with the NRC's reactor oversight program significance determination process (SDP). Two findings concerned failure to initiate condition reports for identified problems with the emergency diesel generator fuel oil day tank level instrument switches. Three findings involved significance classifications for problems with: a gas turbine, the steam driven auxiliary feedwater turbine drive pump, and a containment vent monitor that were not commensurate with the potential risks. Two findings related to incomplete problem evaluations concerning a DC power transfer switch and service water pump power cabling. Two instances of improperly prioritized corrective actions were identified. One concerned the alternate safe shutdown system circuit breakers and

the other involved the refueling water storage tank instrument line freeze protection. Collectively, the nature and number of issues identified indicate the continuing challenges facing your facility, both in the CAP and with recurring equipment issues.

Six of these Green findings were determined to be violations of NRC requirements. However, because they were of very low safety significance in accordance with the SDP and because they have been entered into your corrective action program, the NRC is treating the issues as non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny any of these non-cited violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the Indian Point Unit 2 facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web-site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/ Daniel H. Dorman for:

Wayne D. Lanning
Director, Division of Reactor Safety

Docket No.: 05000247
License No.: DPR-26

Enclosure: Inspection Report 50-247/00-012

Attachments: (1) Supplemental Information
(2) List of Documents Reviewed
(3) List of Acronyms Used

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U. S. NUCLEAR REGULATORY COMMISSION

REGION 1

Docket No.: 50-247
License No.: DPR-26

Report No.: 50-247/00-012

Licensee: Consolidated Edison Company of New York, Inc.

Facility: Indian Point 2

Location: Broadway and Bleakley Avenue
Buchanan, New York 10511

Dates: October 2 through 20, 2000

Inspectors: Wayne L. Schmidt, Team Leader, Senior Reactor Inspector, DRS
Tracy E. Walker, Asst. Team Leader, Senior Reactor Inspector, DRS
Melvin K. Gray, Reactor Inspector, DRS
Peter J. Habighorst, Resident Inspector, Indian Point 2
Alan J. Blamey, Resident Inspector, Susquehanna
Laurie A. Peluso, Reactor Inspector, DRS

Approved by: Wayne D. Lanning, Director **/RA/ Daniel H. Dorman for:**
Division of Reactor Safety (DRS)

SUMMARY OF FINDINGS

IR 05000247-00-012, on 10/02-10/20/2000, Consolidated Edison of New York, Indian Point Unit 2. Annual baseline inspection of the identification and resolution of problems. Several non-cited violations identified dealing with the identification, assessment, and effectiveness of corrective actions.

The inspection was conducted by a regional team leader and inspectors, resident inspectors, and a regional radiation specialist. The findings identified by the team were evaluated using the significance determination process (SDP) and found to be of very low risk significance (Green).

Crosscutting Issues: Problem Identification and Resolution

Effectiveness of Problem Identification

Con Edison had not identified some lower level issues. Additionally in some instances Con Edison personnel did not initiate condition reports (CRs) for identified problems. As a result, the information was not captured in the corrective action program (CAP) for tracking and trending purposes or to determine the need for additional evaluation to ensure effective resolution. (Section .1)

Prioritization and Evaluation of Issues

Most issues were appropriately classified, based on significance; however, several examples did not receive the appropriate level of evaluation. Further the CAP did not consistently ensure that the significance level of repetitive issues would be escalated to consider the potentially increased risk significance and evaluate the effectiveness of previous corrective actions. (Section .2.1)

No improper operability determinations were identified. However, some weaknesses were identified with the screening of CRs for potential operability concerns, with historical operability reviews, and with the documented justification of operability decisions. (Section .2.2)

The team identified several examples of weaknesses in the quality of evaluations. (Section .2.3)

Additionally, the understanding and use of apparent cause codes was limited, making the use of the information for trending purposes less than fully effective. (Section .2.4)

Con Edison made progress in reducing the backlog of open and overdue evaluations; however, a significant number of overdue evaluations still existed. In addition, some corrective action items to complete analyses and evaluations were not timely. (Section .2.5)

Effectiveness of Corrective Actions

Con Edison made progress in reducing the backlog of open and overdue corrective actions; however, a significant backlog of overdue actions still existed. No untimely corrective actions

with an adverse impact on safety-related equipment were identified. Several examples, including

actions specified in work orders (WOs), indicated that Con Edison had not placed particular attention or emphasis on completion commensurate with the condition's potential risk significance. Con Edison did not have a method for distinguishing CAP corrective action item significance within the backlog of open items, however recent actions were taken to identify and review long-standing degraded conditions within the maintenance backlog. (Section .3.1)

The team identified several issues that had not been effectively corrected. These issues included degraded equipment, as well as broader issues such as identification and trending of risk significant deficiencies and to address a quality assurance (QA) audit finding concerning the resolution of conditions adverse to quality. (Section .3.2)

Effectiveness of Licensee Audits and Assessments

Con Edison QA department audits and line organization self-assessments indicated the ability to self-identify issues, many of which were similar to the team's findings. A partial Con Edison effectiveness review for the August 1999 loss of offsite power event corrective actions focused on verification of action completion, not on the effectiveness. (Section .4)

Safety Conscious Work Environment

Con Edison handled CRs that addressed personnel feeling that they were not encourage to identify issues within the CAP and their employee concerns program. From initial review of these issues, the corrective actions taken by Con Edison appeared adequate. In discussions with plant personnel there was no indication of a reluctance to identify safety issues. (Section .5)

Cornerstone: Mitigating Systems

Green. Several problems encountered during WO completion following surveillance test failures on the emergency diesel generator (EDG) fuel oil day tank (FODT) level switches were not documented in the CAP. The failure to correct these conditions was a Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI. These conditions were determined to be of very low safety significance because the time that the level switches were in a degraded state was bounded by the last satisfactorily completed monthly test. (Section .1.2)

Green. Con Edison did not identify in a CR that the EDG FODT level switches were not being calibrated in accordance with existing procedures. The failure to follow procedures was an NCV of 10 CFR 50, Appendix B, Criterion V. This condition was determined to be of very low safety significance because the failure to calibrate the level switches could have but did not impact the operability of the EDGs based on past satisfactory testing. (Section .1.3)

Green. Con Edison did not identify the causes and take effective corrective actions to prevent recurrence of unlatching of the 22 steam driven auxiliary feedwater (AFW) pump turbine overspeed trip lever. The corrective actions following identification of the unlatched condition in March 1999 were not timely nor fully effective to prevent recurrence. When the condition recurred in July 2000, the condition was not evaluated sufficiently to identify the causes or determine whether previous corrective actions had been effective. The failure to determine the cause and prevent recurrence of the unlatched trip lever was considered an NCV of 10 CFR 50,

Appendix B, Criterion XVI. This condition was determined to be of very low safety significance because, in the first instance, the AFW pump turbine unavailability was bounded by routine operator tours and did not exceed TS allowed outage times and, in the second instance, the plant was shutdown at the time. (Section .2.1.1)

Green. Con Edison did not evaluate a failure of gas turbine #1 (GT 1) in September 2000 to determine the cause and identify corrective actions to prevent recurrence. The CR was not classified appropriately given the potential risk significance of the condition, and the apparent repetitiveness of the condition was not considered in determining the significance level of the CR. The failure to determine the cause and prevent recurrence of a significant condition adverse to quality was considered an NCV of 10 CFR 50, Appendix B, Criterion XVI. This condition was determined to be of very low safety significance because the plant was shutdown and defueled at the time of the failure. (Section .2.1.2)

Green. Con Edison failed to perform a complete evaluation when ground settling was identified in the area around Motor Control Center 21 in July 1999. As a result, Con Edison did not identify potential damage to power supply cables for two of the six safety-related service water (SW) pumps until May 2000. The failure to promptly identify and correct a condition adverse to quality was considered an NCV of 10 CFR 50, Appendix B, Criterion XVI. This condition was determined to be of very low safety significance because there was no evidence that the two affected pumps would not have performed their safety function in 1999 and because the other four SW pumps remained operable. (Section .2.3.1)

Green. Con Edison failed to identify the cause for a March 1998 failure of the DC control power automatic transfer switch (ATS) for safeguards bus 2A. As a result, the licensee failed to take corrective actions to prevent recurrence of the transfer switch failure. The ATS failed again in April 1999. The failure to take corrective actions to prevent recurrence of the ATS failure was considered an NCV of 10 CFR 50, Appendix B, Criterion XVI. This condition was determined to be of very low safety significance because of the risk associated with a loss of control power to one safety-related bus and because the switch could be manually positioned to restore control power if a failure occurred. (Section .2.3.2)

Green. Con Edison did not place proper priority on completion of repairs to alternate safe shutdown system breakers to ensure that the degraded breakers were repaired prior to startup Con Edison subsequently added these breakers to the work items to be completed prior to startup. This issue was considered to have very low safety significance because Con Edison has been able to close the breakers on subsequent attempts. (Section .3.1.2.1)

Green. Con Edison has not been effective at correcting numerous past problems with the refueling water storage tank level instruments relative to possible freezing of the sensing lines. Temporary facility changes have been used to maintain operability of the level transmitters, and the degraded condition has not been permanently corrected. This issue has very low risk significance because the temporary corrective actions have been sufficient to maintain the level instruments operable to date. (Section .3.2.1)

Cornerstone: Public Radiation Safety

Green. Con Edison did not classify CRs for repeated problems with the particulate channel of the containment vent radiation monitor appropriately considering the potential safety significance and recurrent nature of the problem. This issue has been determined to have very low risk significance because the redundant channel was operable and each time the monitor failed technical specification requirements were met and appropriate compensatory measures were taken. (Section .2.1.4)

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4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution (IP 71152)

.1 Effectiveness of Problem Identification

a. Inspection Scope

The team reviewed whether Con Edison appropriately identified, and captured in the corrective action program (CAP), nonconforming or anomalous conditions. This review included general plant tours and specific system walk-downs, interviews of station personnel, and review of condition reports (CRs) and work documents. Toured areas included the central control room (CCR), vapor containment and other radiologically controlled areas (RCA), the auxiliary feedwater (AFW) pump room, emergency diesel generator (EDG) room, emergency switchgear areas, and the gas turbine #1 (GT 1) area. Using risk insights gained from the Individual Plant Evaluation (IPE), the team selected the safety injection (SI) and 125 Volt DC systems to perform more detailed system walk-downs. The team reviewed open CRs and work orders (WOs), reports, and maintenance rule history for these systems. The team also reviewed system health reports, prepared by system engineers (SEs), that provided detailed information on the status of system equipment. The team also observed in-plant activities, reviewed operator logs, and interviewed operators, maintenance technicians, and SEs.

Station Administrative Order (SAO) 112, "Corrective Action Program," Rev. 3, provided direction for implementation of the Con Edison CAP. This procedure required the initiation of a CR for any nonconforming or anomalous condition, as soon as possible after discovery.

SAO 112 provided guidance to determine what type of conditions warranted a CR and which one of the four significance levels (SLs), specified in the program, should be assigned. Attachments II and III consisted of a worksheet used to determine the SL considering the probability and consequences (risk) of a condition, and a list of examples of nonconforming or anomalous conditions for which CRs were appropriate, respectively.

SL1 CRs were assigned the highest priority and received the most extensive evaluation. Root cause analyses and extent of condition reviews were performed for SL 1 and SL 2 CRs. For SL 3 CRs, evaluations were performed to determine the apparent cause of the problem and to recommend corrective actions. SL 4 CRs were either entered into another process for corrective action (i.e., maintenance work order (WO) process) or were minor or administrative in nature. Responses to or cause determinations for SL 4 CRs were not required and corrective actions were not tracked within the CAP. Tracking and trending of SL 4 CRs was optional at the discretion of the corrective action screening committee (CASC).

b. Findings

During system walkdowns, the team identified some lower level issues that Con Edison had not identified. Additionally, in a few specific instances Con Edison personnel did not initiate CRs for identified problems. As a result, the information was not captured in the CAP for tracking and trending purposes or to determine the need for additional evaluation to ensure effective resolution. In some of these cases, additional problems and causes discovered while performing work under WOs were not captured, by either initiating new CRs or supplementing the original CRs.

.1.1 System Walkdowns

During plant tours and specific system walk-downs the team identified several conditions that had not been previously captured in the CAP. Most of the issues identified were minor and did not have the potential to impact the operability of safety-related equipment. Con Edison initiated CRs 200007490, 200007532, 200007533, 200007534, 200007536, 200007602, 200007774, 200007776, and 200007925 to address these issues. However, this CAP performance issue involved potential degraded conditions not being identified so that they could be evaluated and corrected.

.1.2 Emergency Diesel Generator Fuel Oil Day Tank Level Switch Maintenance

The team identified several instances in which problems encountered during WO completion following surveillance test (ST) failures of the EDG fuel oil daytank (FODT) level switches were not documented in a new or existing CR.

In the first instance, maintenance personnel did not initiate a CR to evaluate the material condition deficiencies (a misaligned cover and bent shaft) identified during a maintenance activity following a ST failure of the 21 FODT level switch. As a result, the cause of the deficiencies and the extent of condition were not determined. Further, Con Edison did not have a sound technical basis to support the degraded condition in which this switch was left after the maintenance. Following the team identification of this condition, Con Edison initiated CR 200007968 to replace the level switch.

Specifically, on June 14, 1999, the 21 FODT level switch failed during an EDG ST. The operators entered TS limiting condition of operation (LCO) 3.7.B.1.b, and initiated CR 199904669, which was classified as SL 4 and closed to WO NP-99-09436 to investigate the problem. Maintenance personnel found the level controller cover screw missing with the cover misaligned and interfering with level switch operation. The level controller had a bent shaft that did not allow the correct cover reinstallation without further interference with the mechanism. In completing the WO, maintenance personnel installed the cover screw at an angle, not as designed, such that the cover did not hinder the level switch operation, without documenting the problems in a CR or obtaining engineering approval.

In the second case, a CR was not initiated to investigate the intrusion of a sealant into the 22 FODT level switch mechanism found during a maintenance activity following a ST failure. As a result, the cause of the deficiency and the extent of condition were not determined.

Specifically, on November 9, 1999, the 22 FODT level switch failed during an EDG ST. The operators entered TS LCO 3.7.B.1.b and initiated CR 199908499, which was classified as SL 4 and closed to WO NP-99-12382 to investigate the problem. Maintenance personnel documented the failure cause as intrusion of RTV sealant in the level switch mechanism on the WO, but did not initiate a CR.

Finally, following a subsequent unrelated problem, maintenance personnel cleaned and lubricated the 22 FODT level switches without a sound evaluation of this corrective action. While CR 199908540 documented the cleaning and lubrication of the switches, the vendor's manual stated that adequate lubrication was applied during manufacturing and further lubrication may attract debris and interfere with pivot operation.

The team concluded that Con Edison did not identify and correct material conditions adverse to quality regarding the 21 and 22 FODT level switches and did not meet the requirements 10 CFR 50, Appendix B, Criterion XVI. These conditions affect the Mitigating Systems Cornerstone because the switches ensure a supply of fuel oil to the EDGs which power mitigating systems in the event of a loss of offsite power (LOOP). The switches had operated properly during the last monthly STs and in each instance the level switches were returned to operable status in accordance with applicable TS LCOs. Therefore, this issue has been determined to have very low risk significance (Green) in accordance with the NRC's Reactor Safety SDP. This violation was treated as a Non-cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/2000-012-001)**

.1.3 Emergency Diesel Generator Fuel Oil Day Tank Level Switch Calibration Procedures

The team found that 22 and 23 FODT level switches had not been calibrated in accordance with existing procedures. Con Edison had multiple opportunities, but did not identify and correct this condition.

The team noted that the procedures for two of the three (22 and 23) FODT instruments required calibrations while the other (21) directed the technician to exercise the level switches manually to observe the associated equipment response. The 22 and 23 FODT procedures identified calibration input values and output values, as well as acceptance criteria in terms of maximum permissible error.

Completed procedures for the last two years showed that technicians did not calibrate the 22 and 23 FODT level switches, but manually exercised the switches similar to the 21 FODT procedure direction. When the 23 FODT procedure was completed on March 23, 1999, the technician indicated in the comments section that if the level switches were not to be calibrated by changing FODT level, the procedure should be revised to exercise the level switches; however, no CR was generated.

Con Edison also missed an opportunity to identify that the calibration procedures were not being followed when a review identified a missed 1993 Licensee Event Report commitment to calibrate these instruments once each refueling outage. A CR, initiated in August 2000, identified the missed commitment, and determined that exercising of the switches in lieu of calibration was an improper testing technique. The team

questioned the timeliness of the September 2001 corrective action due date to revise the procedures to calibrate the instruments, considering the safety-related function of these switches and the length of time the commitment has been unfulfilled.

The team determined that Con Edison's failure to complete the 22 and 23 FODT level controller calibration procedure as written was a violation of 10 CFR 50, Appendix B, Criterion V, which requires completion of activities affecting quality according to procedures. These conditions affect the Mitigating Systems Cornerstone, because the switches ensure a supply of fuel oil to the EDGs which power mitigating systems in the event of a LOOP and mis-calibrated switches have a potential to impact EDG operation. Periodic STs demonstrated the level control function and the failure to calibrate the level switches could have but did not impact the operability of the EDGs. Therefore, this issue was determined to have very low risk significance (Green) in accordance with the NRC Reactor Safety SDP. This violation was treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/2000-012-002)**

.1.4 Gas Turbine Black-Start Diesel Supply Oil Pressure

The team identified that operators did not initiate a CR to document out-of-specification supply oil pressure log readings on the GT 1 black-start diesel. As a result, the discrepant condition was not evaluated or corrected. Operator logs required weekly verification of zero to five psig supply pressure. During a plant tour and review of the logs, the team observed that the fuel supply pressure indicated six to seven psig and had been out-of-specification for 13 weeks.

Although a CR 199905649 was initiated in July 1999 for a similarly out-of-specification oil pressure condition this discrepant condition was not resolved. The CR was classified as SL 4 and closed to WO NP-99-10302 to adjust the fuel supply pressure regulators. The team determined that the WO did not adjust the fuel regulators because GT 1 ran successfully. No change was made to the weekly operator log.

The responsible system engineer (SE) stated that the out-of-specification log readings were not indicative of a pressure regulator malfunction when GT 1 was not operating. Rather, the specification represented a suitable reading during operation.

The team concluded that the out-of-specification reading did not have the potential to impact the operation of the black-start diesel generator. However, this CAP performance issue involved repeated instances of not documenting a discrepant condition in a CR.

.1.5 Incorrect Radiation Work Permit

Health physics (HP) technicians did not document in a CR a failure to follow a radiological control procedure for signing into the RCA. Specifically, a radiation worker manually signed in on an incorrect radiation work permit (RWP) at the main control point when the computerized RWP process was not functioning. The worker recognized the error upon exiting the RCA and requested assistance from a HP technician, who corrected the error; however, a CR was not initiated. HP procedures require personnel to reference the correct RWP when entering the RCA. SAO-112 lists violations of RWP requirements and procedures as examples of conditions that warrant initiation of a CR.

The team concluded that this issue was not significant because the radiation worker was in the RCA for approximately one hour and received no dose. The failure to follow procedures was considered a minor violation that was not subject to enforcement action in accordance with Section IV of the NRC Enforcement Policy. However, this CAP performance issue involved failure to initiate a CR for an anomalous condition.

.2 Prioritization and Evaluation of Issues

a. Inspection Scope

The team reviewed whether Con Edison appropriately prioritized and evaluated issues following identification in the CAP. To complete this review the team selected a sample of CRs for review, focusing on issues identified since the last NRC inspection of the CAP in December 1998. The sample was based on risk insights gained from the IPE, with emphasis on problems associated with the SI, 125 Volt DC, AFW, and EDG systems. The team examined supporting documents such as WOs, completed maintenance and ST procedures, modification packages, drawings, and operability determinations. The team also reviewed the CRs associated with issues identified as a result of the August 31, 1999, LOOP event.

The team reviewed a sample of CRs to determine whether Con Edison classified and prioritized the issue resolution at a level commensurate with its safety significance. The CRs were reviewed with respect to: equipment operability and reporting requirements, the depth and scope of the cause analyses and adequacy of the proposed corrective actions, and the consideration when appropriate, of extent of condition, generic implications, common causes, and previous occurrences. The team further reviewed the backlog of open condition reports to determine whether the risk resulting from the individual issue or combinations of issues was appropriately considered.

In accordance with SAO-112, the initiator of a CR would determine whether the reported condition had the potential to impact the operability of equipment. Unless the condition had no potential to impact operability, the on-shift watch engineer (WE) would receive the CR to take the appropriate actions in accordance with TS or the plant's licensing basis, and to make the appropriate regulatory reports.

Each weekday the CASC reviewed the operability and reportability decisions made by the initiator and/or the WE for the newly generated CRs, and assigned a SL and responsible manager to the CR.

b. Findings

.2.1 Classification and Prioritization Problems

Most issues were appropriately classified, based on significance. However, the team identified several issues that were not prioritized and evaluated at a level commensurate with the potential risk significance or the safety significance of the problem. Further the CAP did not consistently ensure that the significance level of repetitive issues would be escalated to consider the potentially increased risk significance and evaluate the effectiveness of previous corrective actions.

The team identified the following examples of conditions that should have been classified at least at SL 3 (higher for repeat issues) in accordance with the CAP. All of the conditions had remote or occasional probability of occurrence, and at least marginal consequences as defined by SAO 112. These examples also constituted conditions adverse to quality and involved unplanned TS LCO entries. The SAO 112 attachments indicated that these combinations of probability and consequences should be classified at SL 3, and that conditions adverse to quality, unplanned LCO entries, and failure to meet ST acceptance criteria should be classified at least at SL 3.

.2.1.1 22 Auxiliary Feedwater Pump Turbine Trip

Con Edison did not identify the causes and take effective corrective actions to prevent recurrence of unlatching of the 22 steam driven AFW pump turbine overspeed trip lever. The corrective actions following identification, in SL 2 CR 199902310, of the unlatched condition, at 100% power in March 1999, were not timely or fully effective to prevent recurrence. When the condition recurred in July 2000 while the plant was shutdown, the classification of CR 200005105 at SL 3 was not appropriate given the repetitive problem and the potential risk significance of the condition. In neither case was a specific cause identified.

On March 19, 1999, while the plant was operating at 100% power, an operator on rounds identified that the 22 AFW pump was inoperable because the turbine steam inlet emergency valve had unlatched from the overspeed trip lever and closed, without an overspeed trip condition occurring. The CCR operators had not detected this condition because the CCR annunciator micro-switch only actuates when an overspeed trip condition occurs.

Engineering investigated the condition as a result of the SL 2 CR, concluding that, while the cause could not be determined, the most probable cause was the failure of personnel to properly latch the overspeed trip lever. Engineering provided direction in WO NP-99-07882 to verify the trip lever unlatching force and to inspect the trip lever and valve lever contact surfaces. The WO provided detailed instructions for the trip latch spring setup; however, these instructions were not incorporated in STs and operation procedures used by operators to relatch the turbine. On June 6, 2000, an

operator identified the missing configuration information and did not initiate a CR, but initiated a Communications to Staff tracking item to revise Procedure PT-V8A, "AFW Pump Turbine Mechanical Overspeed Alternate Trip Test" to include this information. At the time of the inspection, the ST procedure had not been revised and a similar tracking item to revise SOP 21.3, "Auxiliary Feedwater System Operation" had not been initiated.

On July 7, 2000, while shutdown, Con Edison personnel identified that the 22 AFW pump turbine was in a similar unlatched condition and initiated SL 3 CR 200005105 to evaluate the condition. This CR did not identify nor discuss the potential that the condition was a repetitive failure. As a result, Con Edison did not investigate the cause of the unlatched condition to the level of detail required to make a reasonable cause determination and failed to address the potential that previous corrective actions in 1999 had not been effective at preventing recurrence.

The SL 3 evaluation focused on the apparent slowness of the emergency valve to travel to the closed position after being unlatched. Con Edison consulted the vendor and concluded the emergency valve operated correctly. In regard to the cause of unlatched condition, the evaluation included one statement that the cause was unknown, and no corrective actions were taken.

In response to the team's questions, Con Edison concluded that CR 200005105 had been improperly closed in August 2000, without a full investigation and initiated CR 200007778 to reinvestigate the July 2000 unlatched condition.

Con Edison's failure to identify the cause and take effective corrective actions to prevent recurrence of unlatching of the 22 AFW pump turbine overspeed trip lever was determined to be a violation of 10 CFR 50, Appendix B, Criterion XVI. This problem could be a precursor to the 22 AFW pump being unavailable when required to operate automatically. This issue affected the Mitigating Systems Cornerstone because AFW supplies the steam generators when main feedwater is unavailable. In March 1999, operator rounds, conducted once per shift, bounded the time the 22 AFW pump turbine was unlatched and the pump unavailablity was within applicable TS LCO times. In July 2000, the plant was shutdown so AFW was not required to be operable. Therefore, this issue has been determined to have very low risk significance (Green) in accordance with the NRC Reactor Safety SDP. This violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/2000-012-003)**

.2.1.2 Gas Turbine 1 Failures to Start

Con Edison did not evaluate a failure of GT 1 in September 2000 appropriately, given the risk significance and the apparent repetitiveness of the condition, to determine the cause and identify corrective actions to prevent recurrence.

On September 22, 2000, GT 1 failed to start twice due to low fuel oil pump inlet pressure. The operators entered TS LCO 3.7.C.3, and initiated CR 200007122, which was classified as SL 4 and closed to WO NP-00-17732 to perform troubleshooting activities. The completed WO indicated that, after the two GT 1 trips, operators

repositioned the supply valve to swap between the north and south supply tanks. Operators then successfully started the machine and completed the ST, exited the TS LCO, and closed the WO. The team identified that GT 1 had previously tripped due to low fuel oil pressure conditions as documented in CR 199905320, CR 199905599 and CR 199905634.

Con Edison did not determine the cause of the low fuel oil pump inlet pressure trips of GT 1, and did not take corrective actions to prevent recurrence as required by 10 CFR 50, Appendix B, Criterion XVI. This condition affects the Mitigating Systems Cornerstone because TS require GT 1 as an alternate source of AC power in the event of a LOOP. At the time of the ST failure the plant was shutdown and defueled such that a minimum level of mitigating equipment was required to be operable. Therefore, this issue has been determined to have very low risk significance (Green) in accordance with the NRC Reactor Safety SDP. This violation was treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/2000-012-004)**

.2.1.3 Safety Injection Accumulator Level Transmitters

The team concluded that Con Edison did not appropriately consider the repetitive problems with the 21 and 23 SI accumulator level transmitters when classifying CRs generated in 1999 at SL 3. As a result, Con Edison did not perform an adequate extent of condition review for the other accumulator level instruments which all have similar piping configurations, and did not address the reason that previous corrective actions were not effective.

In December 1998, Con Edison identified level variations on the two level transmitters for the 23 accumulator in CR 199810996, which was classified at SL 2 based upon past repetitive occurrences. The implemented corrective actions included operators entering the containment to vent the transmitter impulse line due to a nitrogen gas buildup. The team noted that after completion of corrective actions in January 1999, the 23 accumulator level deviations occurred on three separate occasions in 1999. SL 3 CRs were initiated for each occurrence with corrective actions to vent the transmitter. This was previously documented in inspection report 0500247/1999013 as an NCV for ineffective corrective actions. The team verified through system walk-downs that Con Edison implemented plant modification FFX-91-07049-M to address an unwanted nitrogen gas buildup for the 23 safety injection accumulators.

Two accumulator transmitter deviations also occurred in 1999 on the 21 accumulator. SL 3 CR 199900923 and SL 3 CR 199905514 were initiated and similar corrective actions were taken to vent the impulse line. No plant modification for the 21 accumulator transmitter lines occurred, and no further corrective actions were planned to address nitrogen gas accumulation in the impulse lines for the 21 safety injection accumulator. However, the licensee has increased the acceptable accumulator level band, thus allowing more time prior to taking corrective actions to vent the impulse lines.

The team concluded that the repeated level transmitter problems did not impact the operability of the SI accumulators because redundant level indication was available and

corrective actions were taken to vent the transmitters. However, this CAP performance issue involved the failure to consider the repetitiveness of the condition when determining the significance of the issue.

.2.1.4 Containment Vent Radiation Monitor

Con Edison did not properly classify CRs for repeated problems with the particulate channel of the containment vent radiation monitor. The filter paper on one of the two monitors (particulate channel R41) tore eight times between January and April 1999. Each of these failures caused the vent monitor to be inoperable and required entry into a 30-day TS LCO. A SL 4 CR was initiated for each occurrence; however, only three of the CRs were identified for tracking and trending.

In response to the first failure in January 1999, the responsible SE identified a component that needed to be replaced; however, three more failures occurred before the component was replaced with a spare in March 1999. Following the replacement, four more failures occurred before a SL 3 CR was initiated in April 1999. The SE determined that a different component was needed and the new component was installed in June 1999. In the interim, three more failures occurred.

The containment vent monitor is required to measure the amount of radioactivity inside containment. Each of the failures was considered a functional failure of the radiation monitor. As a result, the monitor was in Maintenance Rule a(1) status from March 14, 1999 until January 4, 2000. This issue has been determined to have very low risk significance (Green) in accordance with the NRC Radiation Safety SDP because each time the monitor failed the redundant channel was operable and operators appropriately entered into the TS LCO and took appropriate compensatory measures.

.2.2 Determination of Operability and Reportability

No improper operability determinations were identified. However, the team identified some weaknesses with the screening of CRs for potential operability concerns, with historical operability reviews, and with the documented justification of operability decisions.

In some cases, issues were not properly screened to determine whether the issue could impact the operability of safety-related equipment. For example, the potential for large plastic placards located inside containment to block the containment sump and impact the operability of safety-related injection systems was not recognized by the WE during review of the CR. Although, the CASC members discussed the sump blockage concern, they did not overturn the WE's decision that a documented operability determination was not required. The operability screening determination was subsequently corrected by the initiator of the CR. In another case, both the WE and the CASC failed to recognize that a potentially non-seismically supported telephone box mounted over containment spray pump 22 could impact the pump's operability.

Historical operability was not always considered to determine if a condition was reportable. For example, when an annunciator for refueling water storage tank (RWST)

level failed during refueling operations, no review was performed to confirm that the annunciator circuit degradation did not exist while the reactor was critical and the RWST low level alarms were required to be operable. In another example, the potential impact of corrosion products identified in the city water supply to the AFW system was not evaluated to ensure that the AFW system was operable when required.

The team also identified cases in which the documentation of the justification for operability screening decisions and operability determinations was not sufficient. For example, there was no documented analysis in CR 200002715 to support the determination that an EDG was operable with one cylinder fuel injector not functioning.

.2.3 Identification of Causes and Corrective Actions

The team identified several examples of weaknesses in the quality of evaluations for issues. Additionally, apparent cause code use and understanding was limited, making the use of the information for trending purpose less than fully effective.

.2.3.1 Ground Subsidence Around Motor Control Center 21

Con Edison failed to perform a complete evaluation after identifying ground subsidence (settling) in the area around motor control center (MCC) 21 in July 1999. As a result, the potential for damage to safety-related power supply cables supplying two of the six safety-related SW pumps (25 and 26) was not identified until May 2000.

In 1999, engineering reviewed the downward shift in the MCC duct bank, but did not evaluate the possible effect on the power cables. In May 2000, the damage to the 25 and 26 SW pump power cables was identified while investigating a low cable insulation resistence on another power cable to MCC 21. The damage to the cables was the result of the duct bank shifting downward approximately six inches from the base of MCC 21. Con Edison completed an evaluation that indicated that the cables would have performed their design function.

The team concluded that Con Edison's failure to evaluate the potential effects of the ground subsidence on the power cables to 25 and 26 SW pumps was a violation of 10 CFR 50, Appendix B, Criterion XVI which requires, in part, that conditions adverse to quality are promptly identified and corrected. This issue was considered to have very low safety significance (Green) in accordance with the NRC SDP, because there was no evidence that the two affected pumps would not have performed their safety function in 1999, and because the other four SW pumps remained operable. The 2000 as-found condition of the two SW pump power cables was previously discussed in NRC Inspection Report 2000-008 and characterized as a Green finding. This finding affects the Mitigating Systems Cornerstone because it relates to emergency service water. This violation was treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/2000-012-005)**

.2.3.2 Safeguards Bus Control Power Automatic Transfer Switch

Con Edison failed to identify the cause for a March 1998 failure of the control power automatic transfer switch (ATS) for safeguards bus 2A. As a result, the licensee failed to take corrective actions to prevent recurrence of the ATS failure. The ATS failed again in April 1999.

During a ST in March 1998, ATS EDD-2 failed to transfer. Con Edison initiated CR 199801744, which was classified as SL 3 and closed to a WO to investigate the failure. Con Edison did not complete the investigation until May 26, 1998, when the WO was closed after performing two successful tests of the ATS. No apparent cause was identified and no corrective actions were taken.

On April 21, 1999, while operating at 99% power, control power was lost to safeguard bus 2A, when the ATS failed in mid-position during a ST, placing the plant outside of the design basis and requiring entry into TS LCO 3.0.1. The root cause analysis concluded that the ATS limit switch malfunctioned.

The team concluded that Con Edison's failure to identify the cause of the ATS failure in March 1998 was a violation of 10 CFR Part 50, Appendix B, Criterion XVI which requires, in part, that, for significant conditions adverse to quality, the cause be identified and corrective actions be taken to prevent recurrence. This violation is considered to have very low safety significance (Green) in accordance with the NRC Reactor Safety SDP, based on the loss of control power to one safety-related bus and because the switch could be manually positioned to restore control power when the failures occurred. This finding affects the Mitigating Systems Cornerstone because it relates to emergency power. This violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, issued on May 1, 2000 (65FR 25368). **(NCV 05000247/20000-012-006)**

.2.3.3 Emergency Diesel Generator Load Sequence Relay

Con Edison replaced a failed EDG load sequencer relay without fully evaluating the relay's installed configuration. As a result, there was insufficient basis to support the apparent cause determination for the relay failure.

In May 2000, after an EDG load sequencer relay failure, Con Edison did not collect the as-installed information while replacing the failed relay. As such the apparent cause analysis for SL 3 CR 200003771 did not evaluate possible installation workmanship issues. Although reverse polarity was identified as the apparent cause of the relay failure, there was insufficient basis to support the conclusion. Vendor testing of the failed relay could not reproduce an equipment failure.

This CAP performance issue related to the failure to fully evaluate the cause of the adverse condition.

.2.3.4 Technical Specification Overpressure System Curve

Con Edison did not identify an apparent cause for inconsistencies between the TS bases and supporting calculations for the TS overpressure protection system (OPS)

curve and heatup and cooldown curves. Additionally, it was not clear that proposed corrective actions addressed the identified concern.

SL 3 CR 200004598 was initiated to document inconsistencies which involved the incorporation of instrument error in the OPS and heatup and cooldown curves and calculations. No apparent cause was identified in the CR and no cause codes were identified. The documentation in the CR indicated that this is a longstanding issue and referenced a related CR from 1998. The related CR included a corrective action to revise the TS curves; however, it did not appear to address the issue of instrument uncertainty.

This CAP performance issue involved a failure to identify the apparent cause for a discrepant condition.

.2.4 Cause Code Trending

The team noted inconsistent use and limited understanding of cause codes in condition evaluations. For example, "unawareness" was identified as the human error/inappropriate action code in close to 900 instances in the past year (400 more instances than any other cause code). SAO-112 indicated that a cause code of "unawareness" should be used for skill-based errors involving not paying attention to alarms, signals, precautions, or information not contained in procedures or guidelines. Similarly, "conduct of business" was identified as the most common process cause code, almost twice as often as any other process cause code. More specific cause codes would support more effective trending. The corrective action group (CAG) had also identified weaknesses in the use of the cause codes and trending process, and included plans to improve the coding system and processes in the CAP Business Plan.

.2.5 Evaluation Timeliness

The team noted that, although Con Edison had made progress in reducing the backlog of open and overdue evaluations, a significant backlog of overdue evaluations still existed at the time of the inspection. In addition, some corrective action items to complete analyses and evaluations were not timely.

At the start of the inspection, there were 588 open evaluations. Forty-eight percent (281) of these evaluations were overdue (typically > 30 days since initiation of the CR). One third (196) of these evaluations were over 50 days old (the point at which the CAP procedure requires escalation of overdue SL 1 and SL 2 evaluations to the next level of management). The number of evaluations over 50 days old had decreased from 1,083 in December 1999.

The team also noted that in many cases, although the initial evaluation of an issue was considered complete in the CAP, the issue had not been fully evaluated to determine the acceptability of the condition and identify corrective actions, if necessary. Rather, corrective action items were assigned to perform the necessary evaluation. In many of these cases, the corrective action items to perform the evaluations were not completed in a timely manner, demonstrated by the following example:

.2.5.1 Fire Suppression Sprinklers

Con Edison had not completed the evaluation of installed fire suppression sprinkler heads in the electrical tunnel that had lower than designed actuation temperatures. This issue was first identified in late 1998.

On December 16, 1998, Con Edison identified that two sprinkler heads in the electrical tunnel had higher actuation setpoints than the remainder of the sprinkler heads in the area. Sprinkler heads with the lower actuation setpoints was a configuration not recognized by the manufacturer. An operability determination was performed for the condition; however, it did not specifically address the effects of the lower actuation temperatures. A corrective action item to perform testing on the sprinkler heads with lower temperature setpoints was closed out without testing. The licensee had reopened this action and the action was overdue since May 2000.

The team observed that the lower temperature actuation sprinklers were not likely to reduce the effectiveness of the fire suppression system. However, this CAP performance issue involved a delay in completing the testing and analysis to verify the design of the fire suppression system in a risk significant area.

.3 Effectiveness of Corrective Actions

a. Inspection Scope

The team reviewed the timeliness and effectiveness of corrective actions. To complete these objectives the team reviewed the backlog of open corrective actions to determine the appropriate prioritization commensurate with the safety significance of the issue, including the extension of corrective actions due dates. The team also reviewed the CRs associated with issues identified as a result of the August 31, 1999, LOOP event.

b. Findings

.3.1 Corrective Action Timeliness

The team noted that, although Con Edison made progress in reducing the backlog of open and overdue corrective actions, a significant backlog of overdue actions still existed at the time of the inspection. The team did not identify any untimely corrective actions that had adversely impacted safety-related equipment. However, several examples, including actions specified in WOs, indicated that Con Edison had not placed particular attention or emphasis on completion commensurate with the condition's potential risk significance. The team noted that Con Edison did not distinguish corrective action item significance within the backlog of open items. Con Edison took recent actions to identify and review long-standing degraded conditions within the maintenance backlog.

.3.1.1 Corrective Actions Specified in Condition Reports

At the start of the inspection, almost 25% (573 of 2,320) of the open corrective action items within the condition reporting system were overdue. The monthly metrics for September 2000 indicated that the percent of completed versus scheduled actions for the previous three months was approximately 50% and the average age of open corrective action items was 252 days.

SAO-112 required escalation of SL 1 and SL 2 corrective action items that are more than 30 days overdue. During the inspection CAG initiated SL 3 CR 200007682 to address team concerns about the use of the escalation process. Con Edison concluded that the requirement for reporting overdue corrective action items to management was met by the weekly and monthly metrics produced by the CAG, as well as by periodic email reminders and CRs focused on schedule adherence. The metrics highlight each department's performance with respect to timeliness and schedule adherence for completion of corrective action items. However, unlike the metric for the completion of CR evaluations, the timeliness metric for corrective actions did not distinguish between significant (SL 1 and SL 2) and less significant (SL 3 and SL 4) items. Additionally, there were no weekly lists of the most past due risk significant corrective action items. Further, there was no report indicating specific actions that were not completed as scheduled, and no specific action was taken when the corrective action item went beyond 30 days overdue.

.3.1.1.1 Containment Isolation Design Deficiency

Corrective actions to provide training to engineering personnel on a single failure design deficiency associated with the containment isolation function during containment pressure relief were almost one year overdue.

In January 1999, a single failure design deficiency was identified associated with the containment isolation function during containment pressure relief. The SL 1 evaluation was completed and a modification was implemented to resolve the design deficiency in April 1999. A corrective action item was assigned to include the issue in training for engineering personnel by November 11, 1999. To support this item, an action to evaluate the scope of training and mode of delivery was assigned with a due date of May 30, 1999. At the time of the inspection, both corrective action items were still open. Training department personnel indicated that the issue had been included in one training class for performing 10 CFR 50.59 safety evaluations, but it had not been incorporated into the continuing training for all engineering personnel. The licensee planned to include the issue in continuing training beginning in January 2001.
The delay in including the design deficiency in training for engineering personnel did not have the potential to directly impact plant safety. However, this CAP performance issue involved the failure to implement a corrective action intended to prevent recurrence of a risk significant event in a timely manner.

.3.1.2 Corrective Actions Specified In Work Orders

The team noted that corrective action items were routinely closed to maintenance WOs, and as such would not get tracked for completion relative to the original CR. As described above, SL 4 CRs for equipment in a degraded condition could be closed to a

WO for completion of the corrective action. Additionally, corrective actions for higher SL CRs were also often completed within the WO process without a tracking item within the CAP. These items would normally be verified complete prior to CR closure, but would not be included in the timeliness metrics.

.3.1.2.1 Alternate Safe Shutdown System Breakers

Con Edison did not place proper priority on completion of repairs to alternate safe shutdown system (ASSS) breakers to ensure that the degraded breakers were repaired prior to startup. The ASSS is used to shutdown the plant during a fire in certain areas or with the CCR inaccessible. The breakers are normally not installed and are required to be installed and closed by operators within one hour to ensure cooling to the reactor coolant system components. The degraded condition could result in failure of the interlocks to properly position and prevent breaker closure.

Con Edison experienced problems with the ASSS breakers failing to close after installation. The problems were attributed to interlocks on the breaker and breaker cubicle door not correctly positioning after installation. The misaligned interlocks prevented breaker closure, and required breaker removal and reinstallation to correct the interlock problem. Con Edison had not taken actions to correct the following most recent problems with the ASSS breakers:

- On June 6, 2000, during performance of the quarterly surveillance, the ASSS breaker for the 23 component cooling pump would not close. The breaker cubicle door was found bent which prevented the breaker interlocks from properly positioning. The breaker was removed and reinstalled. Additional force was needed on the breaker door to ensure the interlocks would properly position and allow the breaker to close. SL 4 CR 200004282 was initiated and closed to a WO.

- On June 13, 2000, the breaker lever for the 23 charging pump ASSS breaker was found to be significantly lower than the other ASSS breakers. Since 1994, this breaker had problems with positioning of the interlocks. SL 3 CR 200004493 was initiated and the corrective action to repair the breaker was closed to a WO. The condition of the 23 charging pump ASSS breaker was similar to a previous failure on the 23 service water pump ASSS breaker that required replacement of numerous interlock components to ensure the breaker would operate correctly.

At the time of the inspection, the WOs initiated for repair of the 23 component cooling pump and 23 charging pump ASSS breakers had not been completed, and had not been identified as required to be completed prior to startup. These breakers are required to be operable under the provisions of the fire protection program. This issue is considered to have very low safety significance (Green) using the NRC Reactor Safety SDP, because Con Edison has been able to close the breakers on subsequent attempts. Con Edison added these breakers to the work items needed to be completed prior to startup. This finding affects the Mitigating Systems Cornerstone because it relates to alternate safe shutdown equipment.

.3.1.2.2 Fire Barrier Penetration

Con Edison did not complete work to allow inspection of a fire barrier penetration in a timely manner, nor was an evaluation of the condition completed in a timely manner.

During inspection of 10 CFR 50, Appendix R fire barriers on July 21, 1999, a penetration located between a cabinet in the CCR and the cable spreading room was blocked by retired cabling and could not be inspected. A SL 3 CR was initiated to address this issue, as well as generic issues associated with the fire barrier inspections.

The documentation of the operability evaluation in the CR indicated that the requirements of the administrative procedure for the fire protection program were met. A priority 4 WO was generated to remove the retired cabling which potentially contained asbestos. A note on the WO indicated that, if the penetration was not inspected by November 1999 (the required date for the inspection), the penetration should be considered inoperable. As of the date of this team inspection, the WO had not been scheduled for completion. The penetration that could not be inspected was not declared inoperable and was not included on the list of fire barrier impairments.

During a review of CRs, Con Edison identified that the SL 3 for this CR evaluation had not been assigned. The evaluation was assigned with a due date of April 30, 2000, and had not been completed at the time of the inspection. Although the evaluation was in progress, the responsible engineering department manager indicated that the evaluation addressed only the generic issues documented in the CR and would not have addressed the penetration that had not been inspected.

Following the inspection, in response to the team's questions, the licensee reinspected the penetration and determined that the fire barrier was operable. The sealant for the penetration was visible, and no air or light could be detected at the penetration.

It appeared that until it was questioned by the team, the reported condition had not been reviewed by a fire protection engineer. The delay in completing the inspection of the fire barrier penetration did not have a potential to impact plant safety because the barrier was determined to be operable. However, this CAP performance issue involved the lack of engineering review of a potentially risk significant inspection finding.

.3.1.3 Generic Letter 91-18 Reviews

Within the past year, Con Edison initiated a process to review long-standing degraded conditions affecting safety-related equipment for impact on operability and timeliness of corrective actions in accordance with Generic Letter (GL) 91-18, "Resolution of Degraded and Nonconforming Conditions". This effort effectively identified long-standing degraded conditions and most of the documented reviews addressed whether the degraded condition affected the operability of the equipment. However, none of the reviews explicitly addressed whether the condition needed to be corrected within the next available opportunity or whether the degraded condition should be accepted as is and evaluated as a defacto change in accordance with 10 CFR 50.59.

.3.2 Corrective Action Effectiveness

The team identified several issues that had not been effectively corrected. These issues included degraded equipment, as well as broader issues such as identification and trending of risk significant deficiencies and a quality assurance (QA) audit finding concerning the resolution of conditions adverse to quality.

.3.2.1 Refueling Water Storage Tank Level Transmitters

Con Edison has not been effective at correcting numerous past problems with the RWST level instruments relative to possible freezing of the sensing lines. Temporary facility changes have been used to maintain operability of the level transmitters, and the degraded condition has not been permanently corrected.

In March 1999, CR 199901783 identified that one of the two RWST level transmitters was drifting high due to freezing in the instrument lines. Prior to March 1999, nine separate CRs documented various deficiencies associated with the level transmitter heat trace system. Corrective actions included the implementation of plant modification FPX-99-12073-F to correct heat trace deficiencies. In January 2000, Con Edison identified degradation (torn tent material and inoperable space heater) of the temporary enclosure, installed to supplement the RWST level transmitter heat trace during severe weather.

On October 4, 2000, during a SI system walkdown, the team identified that the insulation around one of the two RWST level transmitters was in poor condition (CR 200007490). A CR and WO had previously been initiated in February 1999 to address poor insulation on the enclosure for one of the RWST level instruments. The WO was assigned as priority 4 and was not scheduled to be completed at the time of the walkdown. During the inspection, the CASC reviewed a CR initiated for this WO as part of the GL 91-18 reviews discussed above. The WE and CASC members recognized the need to complete the work prior to the onset of adverse weather and assigned a 350 degree hold to the GL 91-18 review. On October 6, 2000, the WO was added to the outage scope, to be completed prior to exceeding 350 degrees.

The team was concerned with the continued use of temporary facility changes to maintain operability of the RWST level transmitters during adverse weather, because

the underlying problem had not been resolved. Con Edison initiated CRs 200007538 and 200007659 to evaluate the continued use of temporary facility changes to provide supplemental freeze protection for the RWST level transmitters. This issue has been determined to have very low risk significance (Green) in accordance with the NRC SDP, because the temporary corrective actions have been sufficient to maintain the level instruments operable to date. The issue affects the Mitigating Systems Cornerstone because the RWST level instruments provide indication used to make decisions on mitigating actions during accident conditions.

.3.2.2 Fire Brigade Qualification

Corrective actions to address missed medical and respirator qualification requirements for fire brigade personnel were not effective as evidenced by recurrence of similar issues.

On April 28, 1999, Con Edison determined that thirty-two of forty-seven fire brigade personnel, as well as two fire brigade leaders did not meet the fire brigade medical and respirator qualification requirements per SAO-706, "Fire Brigade Organization, Operation, and Training." The failure to meet the fire brigade qualifications was attributed to lack of a station qualification matrix.

Corrective action was initiated to develop a station qualification matrix to ensure fire brigade personnel qualifications were maintained. In June 1999, this corrective action was closed without completing the qualification matrix. Subsequently, in January 2000, Con Edison identified that one fire brigade leader had held the watch at least nine times without being respirator qualified; and in July 2000, two fire brigade personnel and one shift manager did not have current respirator qualifications. Subsequently, these personnel completed the needed qualifications.

License Condition 2.K of License DPR-26 requires Con Edison to implement and maintain all provisions of the NRC-approved fire protection program as described in the Updated Final Safety Analysis Report. SAO-703, "Fire Brigade Organization, Operation, and Training," delineates the requirements for fire brigade personnel. This procedure requires current respirator fits and medical exams to maintain respirator qualification. The failure to follow procedures is considered a minor violation, that is not subject to enforcement action in accordance with Section IV of the NRC Enforcement Policy, because there was no impact on plant safety. However, this CAP performance issue involved the failure to take effective corrective actions for an anomalous condition.

.3.2.3 August 1999 Event Corrective Actions

Corrective actions to detect and trend recurring risk significant deficiencies have not been timely or fully effective. These actions were taken as a result of station personnel not appreciating the significance of signal spikes and intermittent grounds on DC logic circuits, which was one root cause for the August 31, 1999, LOOP event.

One of the corrective actions was to provide a methodology to detect and trend recurring risk significant deficiencies. This action was closed on April 15, 2000, and the

closure documentation indicated that risk significant deficiencies can be trended in the CAP and that system health reports utilize this capability.

The team noted that, although the CAP has the capability to identify and trend recurring problems, this capability was not utilized consistently in the determination of CR significance. There was no method in place to ensure that a problem was identified as repetitive when determining the significance level of a CR. The CAP procedure listed a repetitive equipment failure as an example of a condition that would be classified at least at SL 3; however, the procedure did not explicitly indicate that repetitiveness should be considered as a basis for increasing the significance level of a CR. Additionally, system health reports would not determine that a problem was repetitive at the time of identification and classification.

Another corrective action was to redefine the responsibilities of Plant Engineering individuals for system and equipment anomalies/trends. This corrective action was originally assigned to CAG with a due date of January 30, 2000. The due date had been extended to July 31, 2000 and, during the inspection, the CARB granted another extension until December 6, 2000, and approved reassignment of the action to the Plant Engineering department.

The team observed that the CASC relied on the historical knowledge of its members or the SE to identify repetitive problems. The SEs were not CASC members and did not have a clearly defined responsibility to identify repetitive equipment failures. Based on interviews, the team concluded that SEs rarely recommended changes to the SL assigned by the CASC.

Con Edison also credited the CAP weekly and monthly metrics to bring management attention to risk significant issues. One of the metrics used by the CAP to identify risk significant issues, a weekly list of the twelve most overdue risk significant evaluations, was not an effective method for bringing management focus to risk significant items. This list was generated by selecting the oldest open evaluations from the population of all open SL 2 evaluations and open SL 3 evaluations associated with the six most risk significant systems. However , the items on the list were not individually evaluated to ensure that they were potentially risk significant. For example, one of the items on the list was a SL 3 evaluation associated with failure to properly notify the HP department in advance of performing radiography, it was included on the list because the CR was associated with the AFW system, not because of its potential impact on plant risk.

This issue did not directly affect any safety-related equipment. However, this CAP performance issue involved failure to ensure timely and fully effective corrective actions.

.3.2.4 Resolution of Conditions Adverse to Quality

The team determined that Con Edison did not take effective actions to address a QA audit finding involving the resolution of conditions adverse to quality. Proposed corrective actions were not implemented effectively and completely, and the evaluation of the problem was incomplete.

In August 1999, a QA audit found that it was improper to close CRs that involved conditions adverse quality to Requests for Engineering Services (RES) because the RES program was not adequately controlled to satisfy QA program commitments for the CAP. This finding was based on the fact that the evaluation phase of the CR process was bypassed or delayed, and there were no written guidelines for CAG concurrence with RES cancellations. Examples of RESs related to CRs that were canceled without notification of CAG, contrary to the requirements of the CAP procedure, were also referenced as part of the audit finding.

A corrective action item, intended to revise SAO-112 to not allow conditions adverse to quality to be classified at SL 4, and to preclude closure of such CRs or their assigned corrective actions until completion, was not fully effective. Although conditions adverse to quality were listed in the revised SAO-112 as examples of SL 3 conditions, the procedure allowed classification of conditions adverse to quality at SL 4 if the problem clearly related to equipment in a degraded condition that required corrective maintenance or modification and no other corrective actions were open or required. This action was closed on May 22, 2000, and the review of corrective actions for the audit finding was completed on September 7, 2000. Con Edison initiated CR 200007529 to address the apparent deficiency in the CAP procedure. Further, although the practice of closing CRs to RESs ceased, the RES procedure had not been revised at the time of the inspection and SAO-112 still allowed SL4 CRs to be closed to the RES process.

The team concluded that the CAP procedure had not been revised as intended because it still allowed conditions adverse to quality to be classified at SL 4 and the practice was common, as indicated in the examples described above. The team also noted that the SL 2 evaluation for this audit finding did not specify a root cause and did not address the appropriateness of closing CRs to other lower tiered processes, such as the maintenance WO process.

This issue did not directly effect any safety-related equipment. However, this CAP performance issue involved a failure to fully evaluate and correct a QA audit finding.

.4 Effectiveness of Licensee Audits and Assessments

a. Inspection Scope

The team reviewed the QA audits and Con Edison self-assessments listed in Attachment III. The purpose of the review was to determine if: 1) problems and issues identified in the assessments were properly entered into the CAP when required; 2) the assessment of performance in the problem identification and resolution area reflected an understanding of existing CAP problems; and 3) the assessment of performance was comparable to the NRC assessment results.

The team reviewed an interim corrective action effectiveness review associated with the August 1999 event. In the IP2 Recovery Plan, Con Edison committed to perform a review to verify the effectiveness of corrective actions taken to address the management, technical, and process challenges identified as a result of the August, 31, 1999, LOOP event. At the time of the inspection, the QA department had recently completed such a review for the primary root causes identified in SL 1 and SL 2 evaluations completed in 1999. At the time of the QA review Con Edison considered all of the corrective actions identified from the SL 2 evaluation and the majority of the corrective actions from the SL 1 evaluation complete.

The team also reviewed the processes and procedures for review of completed CR evaluations and closeouts, as well as effectiveness of completed corrective actions. The team observed CARB activities with respect to oversight of the CAP.

b. Findings

.4.1 Self-Assessments and Audits

Con Edison QA audits and line organization self-assessments indicated the ability to self-identify issues in the problem identification and resolution area. Problems were entered into the CAP when required. Many of the issues identified by the team in this report were similar to those identified by Con Edison. The team also noted that the effectiveness of corrective actions for previous problems was evaluated during self-assessments.

A recent engineering self-assessment identified that plant and component engineers were effectively addressing emerging plant needs; however, weaknesses were identified in engineering support of the work control process. Specifically, the intent of the work week process was not being met due to the lack of a resource-loaded schedule and management's inability to hold the organization accountable for working within the schedule. The engineering self-assessment also identified that corrective actions from the August 31, 1999, event to improve knowledge and awareness of the plant's design and licensing basis had not been fully effective in that some personnel did not have an adequate understanding of how their actions could impact the station design and licensing basis.

QA audits of the corrective action program, conducted in August 1999 and February 2000, identified some of the same problems identified by the team, including problems with the quality of SL 3 apparent cause evaluations, as well as untimely and improper closure of corrective actions. CRs were written to address the significant audit findings.

A self-assessment, conducted by the CAG in June 2000, identified many of the problems identified by the team, including ineffective use of cause trend codes, weaknesses in the operability screening process, and a lack of consideration of repeat failures by the CASC. The CAG developed an improvement plan to address the identified weaknesses. The improvement plan included initiation of CRs and revisions to

the Business Plan. The CAG also performed a self-assessment of the CAP in September 2000, and revised the Business Plan based on the results.

Also in June 2000, the CAG identified an adverse trend in the quantity of overdue CR evaluations. A SL 3 CR was initiated and the apparent cause was determined to be lack of accountability for the line managers to follow procedures and failure of management to hold the line managers accountable. Corrective actions were taken to: request the Plant Manager to take a more active role in holding managers accountable for completing evaluations in a more timely manner; evaluate the weekly metrics; and send email reminders for overdue evaluations. The evaluation concluded that the weekly metrics contained the necessary information.

A 1999 CR common cause review identified problems with procedure quality and adherence, as well as CAP implementation. A CAG review of the corrective actions taken following the common cause review indicated that progress to address process, procedural and accountability issues had not been made.

.4.2 Corrective Action Effectiveness Reviews

The team noted that the QA corrective action effectiveness review document for the August 1999 event focused on verification that the assigned corrective actions had been completed, rather than assessing the effectiveness of the implemented corrective actions. At the time of the inspection, there was no procedural guidance for the performance of corrective action effectiveness reviews.

The licensee determined that progress had been made in addressing the primary root causes for the August 1999 event, but that further progress and management attention were needed to correct degraded equipment and material condition problems. The licensee also identified that some of the corrective actions for the root causes had been closed before the intended actions were fully implemented. The licensee concluded that, although the corrective actions were later completed, this poor practice had the potential to detract from the effective implementation of the corrective actions.

The following provides a comparison of the specific QA review and the team's review:

1. One of the primary root causes was that the station did not appreciate the risk significance of signal spikes and intermittent grounds on DC logic circuits. The QA review concluded that station awareness regarding grounds and signal spikes had been heightened, but acknowledged that there was room for improvement in this area.

   The team noted that the licensee's assessment of the corrective actions for this root cause was narrowly focused on grounds and signal spikes. Although the assigned corrective actions to address this root cause consisted of process improvements to consider risk in the evaluation of problems and in the approval of work, the QA review did not address these broader corrective actions.

As discussed above (Section .3.2.3), the team found the corrective actions taken to address this root cause have not been timely or fully effective. In addition to the concerns identified regarding the consideration of risk significance and repetitiveness in the classification of issues, the team noted that another corrective action to address this root cause did not appear to meet the intent of the assigned action. Specifically, the corrective action to implement a process to include risk assessment of plant and operating experience in the approval of planned or emergent work was closed with reference to procedural instructions for including discussion of risk and operating experience in pre-job briefings. This did not appear to meet the intent of the assigned action because it did not address the use of risk in the approval portion of the work control process.

2. Another primary root cause was that ineffective work prioritization delayed corrective maintenance on the station auxiliary transformer tap changer. QA concluded that changes in the work control process have resulted in better prioritization and understanding of the risk significance of the WO backlog, but acknowledged that improvement is needed to continue correction of existing degraded equipment problems.

   The team acknowledged that improvements have been made in the work control process for prioritization of risk significant work. However, as discussed above (Section .3.1), the team identified weaknesses in identifying the risk significance of degraded conditions, as well as with the prioritization and timeliness of completion of work within the backlog.

   The team was unable to fully assess the corrective actions because the plant had been shutdown since February 15, 2000, and there had been insufficient opportunity to assess the effectiveness of the changes to the work control process.

3. QA concluded that the corrective actions to address the difficulties in precisely adjusting equipment used to set 480V breakers were appropriate and that completed corrective actions met the intent of the assigned action.

   The team noted that the QA review did not appear to address the effectiveness of the corrective actions in that no review was documented to verify that breakers have been properly calibrated since the extent of condition review that was performed following the event.

4. The delays in restoration of safety-related equipment in response to the LOOP event were attributed to less than adequate management focus on plant conditions following the reactor trip with problems noted in command and control, processes, event response support, emergency planning, training, and communications. The QA review concluded that, overall, improvements have been made to prevent recurrence based on objective evidence.
   The team noted that the QA report did not document this objective evidence, and the review appeared to consist of a verification that assigned corrective actions had been completed, rather than a review of the effectiveness of those actions.

The team observed that the CARB presentation of the results of the QA department's effectiveness review focused on the improvement initiatives in the Business Plan and provided very little evidence to support the positive conclusions that progress had been made in correcting the root causes and preventing recurrence of the problems. Licensee personnel had similar observations, and the CAG performed a review to determine how effectively the CAP requirements for effectiveness reviews were being met. This review determined that the corrective action item for the effectiveness review for the August 31, 1999, event was improperly closed, and identified additional SL 1 CRs that did not have appropriate effectiveness review plans. The CAG also identified that there was no procedural guidance for performance of corrective action effectiveness reviews. CRs were initiated to address the lack of guidance for performance of effectiveness reviews and for the improper closure of the corrective action item for the August 31, 1999 event effectiveness review. At the time of the inspection, the CAG was performing an interim effectiveness review for the corrective actions from the August 31, 1999 event and planned to perform another effectiveness review when all of the corrective action items are complete.

.5 Assessment of Safety Conscious Work Environment

a. Inspection Scope

The team reviewed issues in the CAP and interviewed Con Edison employees and contractors to assess if an environment conducive to the identification of issues existed.

b. Findings

The team found several CRs where personnel felt that they were not encouraged to identify issues in the CAP. Con Edison handled these issues within the CAP and their employee concerns program. From an initial review of these issues, the corrective actions taken by Con Edison appeared adequate. In discussions with personnel there was no indication of a reluctance to identify safety issues.

OA6 MEETINGS, INCLUDING EXIT

.1 Exit Meeting Summary

At the conclusion of the on-site portion of the inspection on October 20, 2000, the team held a briefing with Con Edison management to discuss the preliminary findings. The final exit meeting was held on November 16, 2000.

No proprietary information was identified during the exit.

ATTACHMENT (1) - SUPPLEMENTAL INFORMATION

ITEMS OPENED. CLOSED AND DISCUSSED

Open and Closed:

NCV 05000247/2000-012-001	Failure to Identify and correct material issues with emergency diesel generator fuel oil day tank level switches during maintenance.
NCV 05000247/2000-012-002	Failure to complete emergency diesel generator fuel oil day tank level switch calibrations in accordance with written procedures.
NCV 05000247/2000-012-003	Failure to identify the cause and take effective corrective actions to prevent recurrence of unlatching of the 22 auxiliary feedwater pump turbine overspeed trip lever.
NCV 05000247/2000-012-004	Failure to determine the cause of the low fuel oil pump inlet pressure trips of gas turbine #1 and to take corrective actions to prevent recurrence.
NCV 05000247/2000-012-005	Failure to identify the effects of the ground subsidence on the power cables to 25 and 26 service water pumps.
NCV 05000247/2000-012-006	Failure to identify the cause of a March 1998 DC automatic bus transfer switch failure.

ATTACHMENT (2) - PARTIAL LIST OF DOCUMENTS REVIEWED

Procedures:

SAO-112 - Corrective Action Program
SAO-133 - Procedure, Technical Specification and License Adherence and Use Policy
SAO-140 - Indian Point Self-assessment Program
SAO-204 - Work Control
SAO-251 - Conduct of Maintenance
SAO-420 - Industry Operating Experience Review Program
SAO-460 - 10 CFR 50.59 Safety Evaluations
SAO-252 - Event Response Team

CAG-20.101 - SL-3 Quality Review
CAG-20.107 - Corrective Action Screening Committee Guidelines
CAG-20.200 - Corrective Action Review Board
SE-302 - Work Control Process Interfacing Responsibilities Standard
SE-Q-12.106 - Analysis of Significant Events

SE-SQ-12.317 - Equipment Operability Assessment

Audits and Self-Assessments:

Engineering Self-assessments, dated August 2000 and March 1999
Work Control Self-assessment, dated January 2000
Self- Assessment Effectiveness Evaluation, dated January 2000
QA Effectiveness Self-assessments, dated January 2000 and September 2000
Maintenance Rule Periodic Assessment, January 1998 - December 1999
Deficiency Identification Tag Process Self-assessment , dated February 1999
System Engineering Self- assessments, dated June 1999 and October 1999
Corrective Action Group - Quarterly Assessments
Maintenance Rule Program Status
Maintenance Rule Periodic Assessment, dated July 2000
Effectiveness Review CAP Leadership Plan, dated June 2000
Common Cause Analysis of Events, dated December 1999
Corrective Action Program Business Plan, Rev. 4

ATTACHMENT (3) - LIST OF ACRONYMS USED

AFW	auxiliary feedwater
ASSS	alternate safe shutdown system
ATS	automatic transfer switch
CAP	Corrective Action Program
CAG	Corrective Action Group
CARB	corrective action review board
CASC	corrective actions screening committee
CCR	central control room
CFR	Code of Federal Regulations
CR	Condition Report
EDG	emergency diesel generator
FODT	fuel oil day tank
GL	Generic Letter
GT 1	gas turbine #1
HP	health physics
IPE	Individual Plant Evaluation
LCO	limiting condition of operation
LOOP	loss of offsite power
MCC	motor control center
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
OPS	overpressure protection system
QA	quality assurance
RCA	radiologically controlled area
RES	Requests for Engineering Services
RWP	radiation work permit
RWST	refueling water storage tank
SAO	Station Administrative Order
SI	safety injection
SE	system engineer
SDP	Significance Determination Process
SL	significance level
ST	surveillance test
SW	service water
TS	technical specifications
WE	watch engineer
WO	work order