

August 20, 2001

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 2 - NRC INSPECTION REPORT 50-247/01-06

Dear Mr. Blind:

On June 30, 2001, the NRC completed an inspection at the Indian Point 2 nuclear power plant. The enclosed report presents the results of that inspection. The results were discussed on July 3, 2001, with Mr. John Groth and other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

NRC findings this period confirmed safe plant operation, but two issues of very low safety significance were noted which were indicative of mixed performance in the areas of configuration and work control. First, the improper installation of couplings resulted in a leak from the fire suppression system, which flooded the utility tunnel. Second, long-standing degraded conditions in the gas turbine generator support systems impacted the availability of a risk significant system. Additionally, it was determined that the plant had previously operated for a period of time in cold shutdown without adequately accounting for instrument uncertainties in the setpoint of the overpressure protection system. The safety significance of this issue is pending further NRC review. Further, in the area of cross cutting issues, we noted that human performance errors contributed to plant events and challenged plant operators. Although these issues did not result in significant reductions in the margins of safety, your continued attention to these areas as part of the Business Plan initiatives to improve station performance is warranted.

Based on the results of this inspection, the inspector identified one violation of NRC requirements regarding the failure to have a combustible loading calculation for fire zones evaluated in the fire hazards analysis. However, because of its very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a Non-cited violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny this Non-cited violation, 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 DC 20555-0001; with copies to the Regional

A. Alan Blind

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Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Indian Point 2 Nuclear Power Plant.

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 the 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). Should you have any questions regarding this report, please contact Mr. Peter Eselgroth at 610-337-5234.

Sincerely,

/RA/

Brian E. Holian, Deputy Director
Division of Reactor Safety

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

Enclosure: Inspection Report No. 50-247/01-06

Attachment 1 - Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

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

Report No. 50-247/01-06

Licensee: Consolidated Edison Company of New York, Inc.

Facility: Indian Point 2 Nuclear Power Plant

Location: Buchanan, New York 10511

Dates: May 19 - June 30, 2001

Inspectors: William Raymond, Senior Resident Inspector
Peter Habighorst, Resident Inspector
Paul Frechette, Security Specialist
Scott Barber, Project Engineer
Greg Cranston, Reactor Inspector, DRS

Approved by: Peter W. Eselgroth, Chief
Projects Branch 2
Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000247-01-06; on 5/10/01- 6/30/01; Consolidated Edison; Indian Point 2 Nuclear Power Plant. Fire Protection, Operability Evaluations and Cross-cutting Issues.

The inspection was conducted by resident and region-based inspectors. The significance of issues is indicated by their color (green, white, yellow, red) and was determined by the Significance Determination Process (SDP). This inspection identified all green or no color issues. The “no color” significance level indicates that the IMC 0609 “Significance Determination Process” does not apply to these findings.

Cornerstone: Mitigating Systems

Green. During a test of the fire water system on June 5, 2001, the 12 inch fire water header failed, which resulted in a leak of 231,000 gallons of city water into the Utility Tunnel. The automatic and manual fire suppression system was inoperable for approximately 1 hour and 15 minutes, which impacted 14 fire zones that contained alternate safe shutdown equipment. The licensee restored the main fire header back to a fully functional status on June 10, 2001. The fire header failed because of inadequate alignment and torque setting of the Victaulic couplings when the header was modified in November 2000. This issue was evaluated in the Significance Determination Process and found to have very low safety significance.

No Color. The inspector identified during a review of the fire hazards analysis that each fire zone throughout the plant did not have a retrievable basis for their combustible loading. The failure to provide a design basis for combustible loading was contrary to TS 6.8.1.a and License Condition 2.K. This violation is being treated as a Non-Cited Violation, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368).

Cross-cutting Issues:

Green. Gas Turbine 2 was found to be inoperable during routine monthly testing on May 28, 2001. GT-2 remained out of service for eight days as Con Edison continued to identify and investigate several support system problems. The problems and degraded material conditions were long-standing and were present despite the recent extended maintenance outage to overhaul GT-2. The untimely resolution of long-standing degraded conditions was a contributor to an adverse performance trend in problem identification and resolution.

No Color. Con Edison’s assessment of the work on the station auxiliary transformer (SAT) tap changer indicated the maintenance had high risk significance due to the potential for a plant transient and electrical system perturbations. Weaknesses were noted in the initial work planning when the tap changer maintenance was attempted on June 7. During the pre-job brief, control room operators identified problems in implementing contingency actions and requested additional contingency planning. Con Edison subsequently refined the risk assessment, implemented planning details, and completed the tap changer maintenance on the on June 19, 2001 with a daily risk factor comparable to the baseline value. The failure to initially manage plant risk during the maintenance activity was a contributor to an adverse trend in problem identification and resolution.

Summary of Findings (cont'd)

No Color. While Gas Turbine GT1 was out of service for repairs, Con Edison applied a tagging order to de-energize electrical equipment prior to asbestos abatement. The tagging order caused the inadvertent loss of IP1 DC control power which impacted the ability to electrically operate 13.8 KV breakers that supply alternate safe shutdown power to IP2 safety systems. The over current protection intended to protect the safe shutdown equipment from a fault was unavailable for about 6 hours. The adequacy of IP1 electrical drawings and staff knowledge of available drawing resources were a factor in the tagging problem. Con Edison identified other inadequacies in IP1 electrical drawings and equipment labeling during the period which impacted tagging activities. The failure to adequately control tagging activities was a contributor to an adverse performance trend in human performance.

No Color. Several other events during the period were indicative of an adverse trend in human performance, including operator performance following the June 5 fire system leak into the utility tunnel; the conduct of a reactor protection system test with an unqualified technician; inadequate preparation resulting in an unnecessary 100 mRem radiation exposure; and, work on the wrong emergency battery light. In response, Con Edison reset the "event free clock" and conducted a station stand down on June 14 - 15, 2001 to review human performance issues.

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Report Details

SUMMARY OF PLANT STATUS

The plant operated at full power throughout the period. During a test of the fire water system on June 5, 2001, a mechanical coupling (Victaulic) within the 12 inch high pressure fire water header failed, which made the fire system inoperable and resulted in the leak of 231,000 gallons of city water into the Utility Tunnel.

1. REACTOR SAFETY (Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness)

1R01 Adverse Weather Protection

.1 Hurricane and High Winds Impact on Emergency Diesel Generator and Gas Turbine No. 1 Structures

a. Inspection Scope (71111.01)

The inspection focused on the design features of the emergency diesel generator (EDG) and gas turbine (GT)- 1 structures to protect these emergency power systems from high wind conditions, and the implementation of abnormal operating instruction (AOI) 28.0.7, "Hurricane/Tornado/High Winds/Severe Thunderstorm." The inspector selected these structures based upon a review of dominate sequences in Con Edison's Individual Plant Examination of External Events (IPEEE) section 6.0, "High Winds, Floods, and Other Events," and the results of the Indian Point Probabilistic Safety Study (Sections 7.4 and 7.7).

The regulatory criteria for this inspection included 10 CFR 50.65, 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," and Technical Specification 6.8.1.a. The reference material reviewed by the inspector included Updated Final Safety Analysis Report Sections 1.11.5 and 8.1.1, the relevant emergency action levels in the IP2 Emergency Plan, Con Edison's Maintenance Rule Structural Monitoring Program, NRC Inspection Report 50-247/86-019, and system operating, abnormal operating, and emergency operating procedures for degraded or loss of offsite power.

On June 5 and 8, 2001, the inspector performed a walkdown of the EDG building and Gas Turbine No. 1 using a number of structural and plan drawings (ref. A226204-05, 33B601, SE5414, SE 5814, 9321-F-1483-3, 9321-F-1460-14, and 9321-F-1461-11). A number of minor conditions were identified that did not impact the structural integrity of the EDG or its support systems. The observations were entered into the corrective action program as condition reports (CRs) 200105695, 200105698, and 200105668. The inspector reviewed relevant CRs of the corrective action program over the past year. No deficiencies associated with the EDG and gas turbine structures were identified.

b. Issues and Findings

No significant findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdown

a. Inspection Scope (71111.04S)

Partial system reviews were conducted to verify support systems and component alignments were proper, and that deficiencies and various housekeeping issues did not impact system function or operability.

On May 31, 2001, the inspector performed a partial walkdown of the 22 and 23 safety injection trains. At that time, the licensee was performing planned maintenance on the 21 safety injection (SI) pump. The references used included check-off list 10.1.1, "Safety Injection System," Revision 17, abnormal operating instruction (AOI) 10.1.1, "Excessive SI Leakage," and plant drawings 9321-F-2735 and 9321-F-2738.

On June 26, 2001, the inspector performed a partial walkdown of the 22 residual heat removal train. At that time, the licensee was performing planned maintenance (valve stroke and quarterly testing) associated with the 21 residual heat removal pump. The references used included check-off list 4.2.1, "Residual Heat Removal System," system operating procedure 4.2.1, "Residual Heat Removal System," Updated Final Safety Analysis figure 6.2-1 sheet 1, and plant drawing A251783-26.

On June 28, 2001, the inspector performed a partial system walkdown of the 125 VDC system to verify system alignment. The inspector verified that breakers were correctly positioned and fuses were of the appropriate size and type. The references used included Operability Determination 00-017, dated December 5, 2000, SOP 27.1.6 and check-off list 27.1.6, "Instrument Buses, DC Distribution and PA Inverter," System Health Reports for the Year 2000 and the first Quarter 2001.

The inspection verified that the licensee properly identified equipment alignment problems that cause initiating events or impact mitigating system availability (reference Condition Reports 200007999, 200101738, 200103034, 200103548, 200103614, and 200106027, 200106392 and 200106399).

b. Issues and Findings

No significant findings were identified.

1R05 Fire Protection.1 Fire Zone Toursa. Inspection Scope (71111.05Q)

The inspector toured the areas important to plant safety and risk based upon a review of Section 4.0, "Internal Fires Analysis," and Table 4.6-2, "Summary of Core Damage Frequency Contributions from Fire Zones," in Con Edison's Individual Plant Examination for External Events. The inspector evaluated conditions related to (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems, equipment and features; and (3) the fire barriers used to prevent fire damage or fire propagation. The areas reviewed were:

- Fire Zone 11, Cable Spreading Room
- Fire Zone 14, 480 Volt Switchgear Room
- Fire Zone 6A, Waste Storage and Drumming Station
- Fire Zone 9, Safety Injection Pump Room, Elevation 59 ft
- Fire Zone 32A, Electrical Tunnel
- Fire Zone 15, Central Control Room (CCR)

Reference material consulted by the inspector included Con Edison's Fire Protection Implementation Plan, Pre-Fire Plan, and station administrative orders (SAOs)-700, "Fire Protection and Prevention Policy," SAO-701, "Control of Combustibles and Transient Fire Load," and SAO-703, "Fire Protection Impairment Criteria and Surveillance." The regulatory basis for the inspection included technical specification 6.8.1.e and license condition 2.K.

The inspector reviewed a sample of fire protection issues within various fire zones entered in the corrective action program over the last 12 months to assess the impact of degraded conditions on fire system operability (reference CRs 200007034, 200009715, 200100307, 200102989, 200103581, 200009470, 200006718, 200008249, 200101917, 200100089, and 200100906). A number of minor material condition issues and procedural deficiencies were independently identified by the inspector that did not impact fire protection, mitigation, or initiation. The observations were entered into the corrective action program as CRs 200105483, 200105511, 200105485, and 200105768.

b. Issues and Findings

No significant findings were identified.

.1 Design Bases for Fire Hazards Analysis

(No Color) During a review of the fire hazards analysis, the inspector identified that each fire zone throughout the plant did not have a retrievable basis for combustible loading. Although a specific combustible loading for each zone was listed, there was no calculation to support this loading. When questioned by the inspector, a ConEd fire

protection engineer (FPE) stated that he believed the basis existed during initial plant licensing, but could not be retrieved at the time of the inspection.

ConEd initially documented the lack of a combustible loading calculation as a deficiency in Condition Report 1998010143 and provided an implementing corrective action (ICA) to generate the needed calculation. In 1999, ConEd employed a contractor to complete the combustible loading calculation for each fire zone. The calculation was drafted in July 2000, and forwarded to ConEd for review and approval. As of July 2001, this calculation was not yet approved, and remained in draft.

The lack of an approved combustible loading calculation impeded the inspector's ability to assess the consequences of a number of discrepancies identified during the inspection. First, the inspector noted that the draft loading calculation did not include a combustible loading allowance for cabling inside panels inside the CCR. This was done because the originator of the calculation used an exception for sealed panels (not ventilated) to justify not having an allowance for the cabling. However, since most of the panels are ventilated, the FPE agreed to recalculate the appropriate loading for the CCR. Second, during a tour of the electrical tunnel, the inspector noted that a number of cable trays appeared to be overloaded relative to the 50% loading value assumed by the fire hazards analysis. When the appropriate raceway drawings were obtained, two distinct cable trays were shown to have loading of approximately 60% and 76%, respectively. The FPE agreed to reevaluate the loading for the electrical tunnel, make appropriate changes, and consider the generic implications of this finding on other fire zones that contain cable trays throughout the plant.

This issue was more than minor because it had a credible impact on safety. Although the issue did not directly impact a reactor safety cornerstone, it did involve extenuating circumstances because it impacted NRC's ability to perform its regulatory function. Specifically, because the basis for the combustible loading for fire zones was not retrievable, the inspector could not adequately assess the consequences of a number of discrepancies identified during this inspection.

The failure to provide a design basis for combustible loading was contrary to License Condition 2.K (Amendment 186) and TS 6.8.1.e. This issue had low actual safety significance because the revised fire loading estimates would not result in a significant change in fire fighting strategies. This violation is being treated as a Non-Cited Violation, consistent with Section VI.A of the Enforcement Policy, issued on May 1, 2000 (65 FR 25368) (**NCV 05000247/2001-06-01**).

.2 Utility Tunnel Flood degraded Fire Suppression System

a. Inspection (71111.05Q)

On June 5, 2001, during an annual test (PT-A22) of the main fire water suppression loop, a Victaulic pipe coupling failed on a 12 inch fire header resulting in the discharge of 231,000 gallons of fire water into the Unit 1 utility tunnel. The inspection involved a review of the licensee's response to the event, a review of the impact of the event on plant safety, observation of the failed coupling, a review of the operations to restore the

fire system header, observation of the licensee's investigation team, and a review of system alignment and the surveillance procedure.

b. Issues and Findings

(Green) The inspector evaluated the risk significance of this event per Manual Chapter 0609, Appendix F. The automatic and manual fire suppression systems were inoperable for approximately 1 hour and 15 minutes, as measured from the time the fire header failed until isolation of the break and refill of the fire water storage tank. Con Edison entered a 7 day action statement per SAO-703 until the level in the fire water storage tank was restored above the minimum volume. The degraded fire system impacted 14 fire zones that contained alternate safe shutdown equipment. During the time that the fire suppression was inoperable the licensee determined that no fire barriers were degraded, no combustibles were located in combustible-free zones, and proper separation existed between alternate safe shutdown equipment.

No alternate safe shutdown equipment or safety related equipment was impacted by the utility tunnel flood. Fire header compensatory measures were implemented within the guidance of station administrative order (SAO)-703, "Fire Protection Impairment Criteria and Surveillance." The licensee restored the main fire header back to a fully functional status on June 10, 2001. Human performance issues associated with this event are documented in section 4OA2.

1R07 Heat Sink Performance

.1 Emergency Diesel Generator Lube Oil and Jacket Water Heat Exchangers

a. Inspection Scope (71111.07S)

The inspector evaluated licensee methods of inspection and cleaning for the three emergency diesel generator lube oil and jacket water heat exchangers, and verified that acceptance criteria were consistent with accepted industry standards. The heat exchangers were selected based upon the high risk achievement worth for the service water system.

The inspector reviewed the following supporting documents:

- FMX-00102-00, Emergency Diesel Generator Jacket Water and Lube Oil Cooler Performance
- Integrated Technologies, Inc. report of Eddy Current Inspections for the 23 (February 2000), 22 (April 2001), and 21 (May 2001) emergency diesel generator coolers
- SE-330, Attachment 1 Inspection Reports for 23 (February 2001), 22 (March 2001) and 21 (May 2001) emergency diesel generator coolers

b. Issues and Findings

No significant findings were identified.

1R12 Maintenance Rule Implementationa. Inspection Scope (71111.12)

The inspector reviewed risk significant equipment problems and Con Edison follow-up actions to assess the effectiveness of maintenance activities for the 125v DC Battery System. Issues selected for review included licensee identification of any functional failures, maintenance preventable functional failures, and repetitive failures as well as problem identification and resolution of any maintenance related issues. The inspector also reviewed system availability, system reliability monitoring, and system engineering involvement. Additionally, the licensee's Maintenance Rule documents and system health reports were reviewed and the system engineer was interviewed. The following performance issues associated with the 125v DC system were assessed:

Condition

<u>Report No.</u>	<u>Condition Description</u>
200005366	125v DC, 22 Battery Failed Load Test, 7/18/2000.
200007999	125v DC, 22 Battery Did Not Make 90% Capacity or > 1.18 Volts Average Cell Voltage During Performance of Battery Load Test, 10/19/2000.
200101738	125v DC, Received a Ground Alarm on 23 Battery Charger: Occurred When 22 EDG DC Transfer Switch Was Returned to Normal, 2/19/2001.
200103034	125v DC, When Testing 22EDG Automatic Transfer Switch Received a Negative to Ground on 23 Battery, Repeat Occurrence of CR 200101738, 3/29/2001.
200103548	125v DC, Two Positive to Ground Alarms on 24 Battery Charger, 4/9/2001.
200103614	125v DC, Positive to Ground on 24 Battery Charger: Same Alarm as Reported in CR 200103548 on Previous Day, 4/10/2001.
200106027	125v DC, Ground Alarm on 21 Batter Charger Panel: Occurred Twice and Was Rest Both Times, 6/17/2001.

OperabilityDetermination

00-017	125v DC 22 Battery Failed to Meet Capacity Criteria Specified In IEEE 450 for Acceptance of a New Battery, 12/5/2000.
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b. Issues and Findings

The inspector observed that when the 22 battery was replaced it was not able to pass the 90% capacity test, including the post installation acceptance test, specified by IEEE 450, Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary Applications. Two tests were conducted resulting in capacities of 86% and 88%. Although the acceptance requirement is 90%, for the system to be operable a minimum capacity of 80% is required. A lower capacity factor can reduce the 20 year battery life. During the tests the current capacity and voltage met all requirements. All design requirements were met and the battery was determined to be fully functional. The licensee had documented the failed capacity tests in their corrective action program at the time of occurrence and had prepared an Operability Determination (OD) to justify continued use of the battery. The licensee is augmenting

the normal surveillance tests with quarterly visual inspections to ensure continued battery performance and operability.

Numerous grounds have occurred on the battery chargers since the beginning of the year. The inspector observed that the licensee was appropriately entering the problems into their corrective action program, is correcting the problems, and is upgrading the battery ground detection circuits. Additional NRC review of this area is described in Inspection Reports 50-247/00-09, 13 and 14.

1R13 Maintenance Risk Assessment and Emergent Work

a. Inspection Scope (71111.13)

The inspector evaluated the effectiveness of the risk assessments performed before maintenance was conducted and verified how the licensee managed the risk. The inspector verified that the licensee took the necessary steps to plan and control the resulting emergent work activity. The following maintenance issues were assessed:

- WO 01-22017, FCV-406D Calibration per ICPM-1357 (CR 200105950)
- WO 01-21664, Station Auxiliary Transformer Tap Changer (CR 200104543)
- WO 01-21827 and 21825, GT2 Starting Diesel Failure (CR 200105523, 5486)
- WO 01-21654, GT1 Asbestos Abatement (CR 200105375, 5365)
- WP 01-58635, 21 Main Transformer Fan Repair (CR 200105638)

The inspector reviewed ConEd's plans and preparations to conduct maintenance on the tap changer for the station auxiliary transformer (SAT). The maintenance was done within the 24 hour action statement of Technical Specification 3.7.B.3 since the SAT was inoperable while the control power was de-energized for the maintenance. The preventive maintenance was completed per work orders WO 01-20923 and 01-21664 to address potential causes for three tap changer "hang-up" events in the May - June 2001 period (reference CRs 200104543 and 200105891).

b. Issues and Findings

While maintenance activities had no actual impact on safe plant operation, the cross-cutting issues described below and in Section 1R16 were indicative of an adverse performance trend in problem resolution evident in work planning, control and implementation.

(No Color) Con Edison's assessment of the work on the station auxiliary transformer (SAT) tap changer indicated the maintenance had high risk significance due to the potential for a plant transient and electrical system perturbations. Weaknesses were noted in the initial work planning when the tap changer maintenance was attempted on June 7. The maintenance was deferred when operators identified problems in implementing contingency actions during the pre-job brief, and requested additional contingency planning. The failure to initially manage plant risk during the maintenance activity was viewed as a precursor to a significant event, and was an example of a cross-cutting issue indicative of an adverse trend in problem identification and

resolution. This issue was entered into the corrective action program as CR 200105725. Con Edison subsequently refined the risk assessments, and implemented planning details that would manage and minimize the risk. Following additional preparations, Con Edison completed preventive maintenance on the tap changer on June 19, 2001, which included inspection and cleaning of relays, cams and contacts. There were no anomalies noted that caused the past problems. The final risk assessment showed the maintenance was completed with a plant daily risk factor in the GREEN band with the core damage frequency of $2.6E-5$, which was comparable to the baseline value.

(No Color) Gas Turbine GT1 was out of service this period for damage assessment and repairs after the generator failed during a surveillance test (Inspection Report 50-247/01-04). Con Edison applied tagging order N-14925 to de-energize all electrical equipment on GT-1 for asbestos abatement prior to disassembly of the turbine. Con Edison issued Condition Report 200105375 because the tagging order caused the inadvertent loss of IP1 DC control power for about 6 hours, which impacted the ability to electrically operate 13.8 KV breakers GT-1 and GT-2 that supply alternate safe shutdown power to IP2 safety systems from Gas Turbine 2 and 3 via the Buchanan Switch Yard. This work control issue had a credible impact on safety because the over current protection intended to protect the safe shutdown equipment from a fault was unavailable without the control power. There was minimal impact on plant safety because the 13.8 breakers remained closed and supplied power while control power was unavailable, and the deficiency was corrected within 6 hours. Con Edison determined that the adequacy of IP1 electrical drawings and staff knowledge of available drawing resources were a factor in the tagging problem. Con Edison also identified other inadequacies in IP1 electrical drawings and equipment labeling during the period which impacted tagging activities. These issues were entered into the corrective action program as CRs 200105365, 200106282, and 200106249. The failure to adequately control tagging activities was a cross-cutting issue indicative of an adverse performance trend in human performance.

(Green) Gas Turbine 2 was found to be inoperable during routine monthly testing on May 28, 2001, due to problems with the starting diesel. GT-2 remained out of service for eight days as Con Edison continued to identify and investigate problems. The GT-2 problems included a failed starting diesel starting solenoid (the fifth burned out solenoid in the last nine months); grounds in the starting diesel DC control circuit; severely corroded conditions on the starting diesel battery; diesel control circuit wiring and drawing discrepancies, and diesel ring gear damage due to the starting motor trying to engage with the flywheel while the engine was idling. The problems and degraded material conditions were long-standing and were present despite the recent extended maintenance outage to overhaul GT-2. These issues were entered into the corrective action program as CRs 200105414, 200105486, 200105439, and 200105570, and 200105556. This issue had a credible impact on safety because the deficiencies impacted the availability of a 13.8 KV power supply in a mitigating system (alternate safe shutdown equipment). The actual safety significance was low because GT-3 was operable to satisfy Technical Specification 3.7.C.1 requirements when GT-1 and GT-2 were inoperable. The failure to more timely address long-standing degraded conditions

was an example of a cross-cutting issue indicative of an adverse performance trend in problem identification and resolution.

1R15 Operability Evaluations

a. Inspection Scope (71111.15)

The inspector reviewed various CRs on degraded or non-conforming conditions that raised questions on equipment operability. The inspector reviewed the resulting operability determinations (ODs) for technical adequacy, whether or not continued operability was warranted, and to what extent other existing degraded systems adversely impacted the affected system or compensatory actions. The following CRs and operability evaluations were evaluated:

- Increased RCS Activity - Fuel Pin Leak (CR 200105777 and 200106126, AOI 12.1, Reactor and Fuel Engineering Procedure 16.101)
- CR 200105375, Loss of Control Power to 13.8KV Breakers GT-1 and GT-2
- CR 200104833 and 200105283, Instrument Accuracies Associated with the Overpressure Protection System (OPS)

The inspector reviewed licensee evaluations and completed walkdowns of plant areas to independently evaluate licensee conclusions. The inspector verified plant operation consistent with the maximum reactor coolant activity limits in Technical Specification 3.1.D following the indications of a fuel pin leak on June 9, 2001 (CR 200105777). For the issue on the overpressure protection system (OPS), the inspector evaluated the corrective action history and past operability evaluations (ref. CRs 199802888, 199904072, 199908215, 200004598, 200104118, 200105381) associated with pressure and temperature instrument uncertainty and impact on operating envelope for the pilot-operated relief valves (PORVs) as depicted in TS figure 3.1.A-1. The inspector reviewed the recently completed "Evaluation of Operational and Technical Compliance with Technical Specification 3.1 Reactor Coolant System."

b. Issues and Findings

Con Edison identified that for approximately 2,714 hours of plant shutdown operations during the last three years, the OPS setpoints under certain reactor coolant system pressure and temperature conditions exceeded the TS Figure 3.1.A-1 when the maximum uncertainty associated with instruments errors were considered. TS Figure 3.1.A-1 specifically states that instrument error was not included in the setpoint curve for the power operated relief valves, yet the TS bases (on page 3.1.A-7) states that "instrument error will be taken into account when the OPS is set; i.e., the instrumentation will be set so that the PORVs will open at less than the required setpoint, including allowance for instrument error." Con Edison failed to have procedures in place that would assure instrument errors were taken into account when setting the PORV setpoints.

During this interval of time no PORV lifted at its setpoint. The inspector confirmed that the as-found and as-left PORV setpoints adhered to TS figure 3.1.A-1 over the last three years prior to accounting for instrument errors. This issue affects the Barrier

Integrity cornerstone in that it could affect the integrity of the reactor coolant system by having inconsistent and misunderstood application of instrument uncertainties in the TS figure 3.1.A-1. This matter is unresolved pending further NRC review of previous pressure/temperature conditions to verify reactor coolant system integrity limits, described in TS 4.3, were maintained. Additional review is also necessary to determine past adherence to the 10 CFR 50 Appendix G limit curve (TS Fig. 4.3.1) due to these previously unaccounted for instrument uncertainties. (**UNR 05000247/2001-06-02**).

1R16 Operator Work-Arounds

a. Inspection Scope (71111.16)

The inspector reviewed the licensee's list of operator work-arounds and selected the following work-arounds for further review: WO 01020221, Position Indication for Control Rod L-3; WO 0017932, 138KV Substation Trouble; and, CR 200103673, Weld Channel Zone 1-4 Low Flow Alarm. The selection of the work-arounds was based upon the potential impact on mitigating systems. The inspector evaluated if an adverse impact existed on the operator's ability to implement abnormal operating procedures or emergency operating procedures with the operator work-arounds. The inspector verified the conditions of the deficiencies and compensatory measures instituted and discussed the impacts with plant operators. The inspector reviewed the condition reporting system to verify deficiencies were identified and properly addressed (reference CRs 200106343, 200105826, 200007540, 200101514).

The inspector reviewed Con Edison's actions to reduce operator burdens (work-arounds and central control room deficiencies). The inspector reviewed the operator burdens to verify that deficiencies did not impact reactor safety.

b. Issues and Findings

No significant findings were identified.

Previous NRC inspections noted reasonable progress in Con Edison's efforts to reduce operator burdens (reference Inspection Report 50-247/01-04). This progress to reduce the backlog of operator burdens leveled off and the total number of burdens was increasing during this inspection period. Con Edison attributed the lack of continued progress to tightening resource constraints and formed a dedicated Fix-It-Now team to address operator burdens starting in early July 2001. Con Edison continued to develop long term work control strategies to minimize operator burdens.

1R19 Post Maintenance Testing

a. Inspection Scope (71111.19)

The inspectors reviewed post-maintenance test procedures and observed testing activities to assess whether 1) the effect of testing in the plant had been adequately addressed by control room personnel, 2) testing was adequate for maintenance performed, 3) acceptance criteria were clear and adequately demonstrated operational

readiness consistent with design and licensing documents, 4) test instrumentation had current calibrations, range, and accuracy for the application, and 5) test equipment was removed following testing.

The selected testing activities involved components that were risk significant as identified in Con Edison's Individual Plant Examination. The regulatory basis for the inspection included Technical Specification 6.8.1.a. and 10 CFR 50 Appendix B criteria XIV, "Inspection, Test, and Operating Status." The following testing activities were evaluated:

- Gas Turbine 2 Oil Pressure Switch repairs per WO NP-01-21825 , June 1, 2001
- 21 Emergency Diesel Generator installation of Temporary Facility Change 2001-057, June 11, 2001
- PMT-21664, Station Auxiliary Transformer Tap Changer (WO-01020923, CR 200106116)

b. Issues and Findings

No significant findings were identified.

1R22 Surveillance Testing

a. Inspection Scope (71111.22)

The inspector reviewed surveillance test procedures and observed testing activities to assess whether 1) the test preconditioned the component(s) tested, 2) the effect of the testing was adequately addressed in the control room, 3) the acceptance criteria demonstrated operational readiness consistent with design calculations and licensing documents, 4) the test equipment range and accuracy was adequate and the equipment was properly calibrated, 5) the test was performed in the proper sequence, 6) the test equipment was removed following testing, and 7) test discrepancies were appropriately evaluated. The surveillances observed were based upon risk significant components as identified in Con Edison's Individual Plant Examination. The regulatory requirements that provided the acceptance criteria for this review were 10 CFR 50 Appendix B criterion V, "Instructions, Procedures, and Drawings," Criterion XIV, "Inspection, Test, and Operating Status," Criterion XI, "Test Control," and Technical specifications 6.8.1.a.

The inspector reviewed a sample of condition reports over the last 12 months associated with the monthly test on the 21 emergency diesel generator and quarterly functional test on pressurizer level bistables (ref. CRs 200005199, 200009752, 200100777, 200100599, 200103416, and CR 200105437).

The following test activities were reviewed:

- PT-Q13, Inservice Testing Valve FCV-406D (Condition Report 200105950)
- PT-M38B, Gas Turbine GT-2 Monthly Functional Test (CR 200105414)
- PT-M21A, Emergency Diesel Generator 21 Load Test, June 12, 2001
- PT-Q54, Pressurizer Level Bistables, June 26, 2001

b. Issues and Findings

No significant findings were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope (71111.23A)

The inspector reviewed the temporary facility changes (TFCs) and associated safety evaluations listed below to verify the facility changes did not impact safety system operability and the license requirements, and did not violate 10 CFR 50.59. The inspector verified the activities were completed in accordance with Con Edison controls for installation, and that deficiencies were entered in the corrective action system (reference CR 200105799). The following TFCs were reviewed:

- 2001-057, 58, 59; EDG Barring Gear Interlock Removal (SE 01-0427-TM)

b. Issues and Findings

No significant findings were identified.

2. EMERGENCY PREPAREDNESS [EP]

1EP6 Drill Evaluation

a. Inspection Scope

The inspector observed Con Edison actions to conduct and evaluate emergency plan training drills on May 16, May 30 and June 12, 2001. The inspection included a review of licensee performance in risk significant activities (classification, notification and public notification), and evaluated the licensee's ability to critique performance.

b. Issues and Findings

No significant findings were identified.

The emergency response organization was activated and managed the simulated plant casualty scenarios. Events were classified and notifications were made to the offsite organizations. The Technical Support Center and the Operations Support Center were exercised to simulate equipment repairs. Con Edison noted areas for improvement and entered these issues in the corrective action system (reference Condition Reports 200105110, 200105111, 200105112, 200105113, 200105502, 200105503, 200105493, 200105475, 200105474, 200105467, 200105920, 200105928, and 200105953). The NRC evaluated Emergency Plan implementation during the graded exercise on June 21, 2001 (reference Inspection Report 50-247/01-07).

3. SAFEGUARDS

3PP1 Access Authorization Program

a. Inspection Scope (71130.01)

The following activities were conducted to determine the effectiveness of the licensee's behavior observation portion of the personnel screening and fitness-for-duty programs as measured against the requirements of 10CFR26.22 and the Licensees Fitness for Duty Program documents.

Five supervisors representing the Emergency Preparedness, Radiation Protection, Procurement, Outage Planning and Corrective Actions Group were interviewed, on May 22 and 23, 2001, regarding their understanding of behavior observation responsibilities and the ability to recognize aberrant behavior traits. Two (2) Access Authorization/ Fitness-for-Duty self-assessments, an audit, and event reports and Loggable events for the four previous quarters were reviewed, during May 21-25, 2001. On May 22 and 23, 2001, five (5) individuals who perform escort duties were interviewed to establish their knowledge level of those duties. Behavior observation training procedures and records were reviewed on May 22, 2001.

b. Issues and Findings

No significant findings were identified.

3PP2 Access Control

a. Inspection Scope (71130.02)

Activities were conducted during the period May 21-25, 2001 to verify that the licensee has effective site access controls, and equipment in place designed to detect and prevent the introduction of contraband (firearms, explosives, incendiary devices) into the protected area as measured against 10CFR73.55(d) and the Physical Security Plan and Procedures.

Site access control activities were observed, including personnel and package processing through the search equipment during peak ingress periods on May 22, 23, and 24, 2001, and vehicle searches, on May 23, 2001. On May 22, 2001, testing of all access control equipment; including metal detectors, explosive material detectors, and X-ray examination equipment, was observed. The Access Control event log, an audit, and three (3) maintenance work requests were also reviewed.

A review was conducted of Condition Report (CR) 200105533 to address a concern identified during the inspection. Other references used during the inspection included: Plant Access Training - Fitness for duty; Security Program Annual Audit Report 00-06-A; Fitness For Duty Audit Report 00-04-D; and, Security Loggable Event Report, 01/00-03/01.

b. Issues and Findings

No significant findings were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification

.1 Security Performance Indicator Verification (IP 71151)

a. Inspection Scope

The inspector reviewed the licensee's programs for gathering and submitting data for the Fitness-for-Duty, Personnel Screening, and Protected Area Security Equipment Performance Indicators. The review included the licensee's tracking and trending reports, personnel interviews and security event reports for the Performance Indicator data collected from the 1st quarter of 2000 through the 1st quarter of 2001.

b. Issues and Findings

No significant findings were identified.

4OA2 Cross Cutting Issues

a. Inspection Scope (71153)

The inspector reviewed several events during the period that were indicative of an adverse trend in human performance, configuration control and work control.

b. Issues and Findings

(No Color) Several events were noted during the period that were indicative of an adverse trend in human performance. In response, Con Edison reset the “event free clock” and conducted a station stand down on June 14 - 15, 2001 to review human performance issues.

Human performance events that contributed to the decision to stop routine work activities included the operator performance issues following the June 5 fire system leak into the utility tunnel, which included untimely recognition of the leak, inadequate contingency planning prior to the test leading to the event, and a lack of questioning attitude (CR 200105634); the conduct of a reactor protection system test with an unqualified technician resulting in the need to re-perform the test (CR 200105841); the failure to have the correct tools on hand while adding oil to the 23 reactor coolant pump resulting in an unnecessary 100 mRem radiation exposure (CR 200105861); and, maintenance personnel working on the wrong emergency battery light (CR 200105908).

Con Edison’s investigation of the June 5, 2001 fire header leak identified the root cause as less than adequate experience and knowledge during the installation of Victaulic couplings in November 15, 2000. Specifically, the pipe coupling failed due to inadequate alignment and clamp tightness (torque) to the existing fire piping. Contributing human performance issues included: the use of a control room supervisor (senior reactor operator (SRO) in control room) as a Test Lead; a recent revision to surveillance test PT-A22, “Fire Loop Flow Performance Test” that did not provide a precaution or limitation to limit the pressure transient on the system; and, pre-job briefs failed to discuss unexpected results or contingency plans or industry operating experience.

A number of issues concerning work control and scheduling contributed to challenges to the operators or to increased unavailability of safety related equipment: (a) on June 1, 2001, poor communications between the watch engineer and the shift manager resulted in the watch engineer failing to perform a risk assessment and then incorrectly declaring gas turbine 3 out of service and inoperable without notifying the shift manager of those decisions (CR 200105541); (b) on June 5, 2001, a poorly planned tagging order (#14862) removed 50% of the cooling fans from service on the 21 main transformer which caused the operators to enter AOI-27.1.7, “Main Transformer High Temperature” and narrowly averted a plant trip when the temperature of the 21 main transformer approached the required transformer shutdown limit (CR 200105638, 200105646 and CR 200105646); and, (c) on June 26, 2001 during planned testing on the 21 residual heat removal pump, the pump unavailability increased due to a lack of timely support by a chemist to acquire a boron sample, and the reassignment of a radiation work permit without non-licensed operator knowledge.

Con Edison continued management focus on the prevention of human performance issues is needed.

4OA4 Licensee Event Report Reviews

- .1 (Closed) LER 05000247/2001-02-00: Loss of 480 Volt Safety Bus. The inspector reviewed the information the licensee provided to describe and analyze this event. The corrective actions for this event were reviewed in NRC Inspection 50-247/00-15. The LER accurately described the event. This LER is closed.
- .2 (Closed) LER 05000247/2000-07-01: Exceeded Technical Specification (TS) 4.10 Surveillance Interval. The inspector reviewed the additional information the licensee provided to describe and analyze this event. The corrective actions for this event were reviewed in NRC Inspection 50-247/00-15. This LER is closed.
- .3 (Closed) LER 05000247/2000-03-01: Steam Generators Classified as Category C-3. The inspector reviewed the initial and supplemental information the licensee provided to describe and analyze this event. The NRC review of the inspection of the old steam generators was described in Report 50-247/00-10. New steam generators were installed prior to startup from the 2000 outage. This LER is closed.
- .4 (Closed) In-Office Review of Supplemental LERs. The inspector completed an in-office review of the supplemental LERs listed below. The LERs were reviewed to verify that the issues described in the reports had been reviewed by the NRC and there was no information presented that warranted further NRC action. The LERs included: 1997-02-01, 1997-02-02, 1997-08-01, 1997-10-01, 1997-12-01, 1997-13-01, 1997-14-00, 1997-15-01, 1997-17-01, 1997-21-01, 1997-22-01, 1997-24-01, 1998-005-01, 1998-06-01, 1998-09-01, 1998-14-01, and 1999-04-01. These LERs are closed.

4OA6 Meetings

Pre-Exit Meeting Summary on Security Inspection

The inspector met with licensee representatives at the conclusion of the inspection on May 25, 2001. At that time, the purpose and scope of the security inspection were reviewed, and the preliminary findings were presented. The licensee acknowledged the preliminary inspection findings.

Exit Meeting Summary

On July 3, 2001, the inspector presented the inspection results to Mr. A. Blind and other members of the Con Edison staff who acknowledged the findings. The inspectors asked whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1**a. Key Points of Contact**

R. Allen	Licensing
A. Blind	Vice President - Nuclear Power
M. Donegan	Health Physics/Radioactive Waste Manager
J. Finnigan	Security Shift Supervisor
L. Guercio	Security Superintendent
R. Majes	Radiation Support Health Physicist
R. Masse	Plant Manager
L. Mettey	NEM Technician
V. Nutter	Radiation Support Manager
W. Osmin	Reactor Engineer
T. Poirier	Work Control Manager
R. Rose	Director Business Services/Nuclear Security
G. Schwartz	Chief Engineer
C. Tippin	Reactor Engineer
W. Smith	Operations Manager
T. Waddell	Maintenance Manager
E. Woody	I&C Manager

b. List of Items Opened, Closed, and DiscussedOpened and Closed During this Inspection

2001-06-01 NCV Fire Protection Design Basis Combustible Loading

Opened

2001-06-02 UNR Failure to Account for Instrument Errors in OPS Setpoints

Closed

LER 05000247/2001-02-00 Loss of 480 Volt Safety Bus

LER 05000247/2000-07-01 Exceeded Technical Specification (TS) 4.10 Surveillance Interval

LER 05000247/2000-03-01 Steam Generators Classified as Category C-3

The following LERs were administratively closed based on an in-office review: 1997-02-01, 1997-02-02, 1997-08-01, 1997-10-01, 1997-12-01, 1997-13-01, 1997-14-00, 1997-15-01, 1997-17-01, 1997-21-01, 1997-22-01, 1997-24-01, 1998-005-01, 1998-06-01, 1998-09-01, 1998-14-01, and 1999-04-01.

c. List of Acronyms

AOI	abnormal operating instruction
CFR	Code of Federal Regulations
CR	condition report
EDG	emergency diesel generator
EOP	emergency operating procedure
EP	emergency preparedness
FPE	fire protection engineer
GT	gas turbines
ICA	implementing corrective action
IPEEE	Individual Plant Examination of External Events
LER	licensee event report
LOCA	loss-of-coolant accident
MREM	millirem
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OD	operability determination
OPS	overpressure protection system
PARS	publicly available records
PORV	power operated relief valves
SAO	station administrative orders
SAT	station auxiliary transformer
SDP	significance determination process
SI	safety injection
SRO	senior reactor operator
TFC	temporary facility change
TS	Technical Specifications
WO	work order