May 17, 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 NUCLEAR GENERATING UNIT NO. 2 - NRC FIRE PROTECTION INSPECTION REPORT 05000247/2000-004

Dear Mr. Blind:

On April 13, 2001, the NRC completed an inspection at your Indian Point Nuclear Generating Unit No. 2. The enclosed report documents the inspection findings which were discussed on April 13, 2001, with Mr. A. Alan Blind and other members of your staff.

This 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. The purpose of the inspection was to evaluate your post-fire safe shutdown capability and fire protection program. Within these areas, the inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. This inspection was a reduced scope inspection in accordance with the September 22, 2000, revision to IP 71111.05, "Fire Protection." Issues regarding equipment malfunction due to fire-induced failures of associated circuits were not inspected while criteria for review of fire-induced circuit failures are the subject of a voluntary industry initiative.

Based on the results of this inspection, the inspectors identified three issues of very low safety significance. These three issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these as Non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny 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, DC 20555-0001; with copies to the Regional 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 Nuclear Generating Unit No. 2.

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Sincerely,

/RA by William H. Ruland for/

Wayne D. Lanning, Director
Division of Reactor Safety

Docket No. 05000247
License No. DPR-26

Enclosure: Inspection Report 05000247/00-004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No:	05000247
License No:	DPR-26
Report No:	0500247/2000-004
Licensee:	Consolidated Edison Company of New York, Inc.
Facility:	Indian Point Nuclear Generating Unit No. 2
Location:	Broadway and Bleakley Avenue Buchanan, NY 10511
Dates:	April 9 - 13, 2001
Inspectors:	R. Fuhrmeister, Sr. Reactor Inspector, Division of Reactor Safety (DRS) R. Bhatia, Reactor Inspector, DRS K. Young, Reactor Inspector, DRS A. Smith, Reactor Inspector, DRS L. James, Resident Inspector, Indian Point 3
Approved By:	James C. Linville, Chief Electrical Branch Division of Reactor Safety

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SUMMARY OF FINDINGS

IR 05000247-00-04, on 04/09-04/13/2001, Consolidated Edison Company of New York, Inc., Indian Point Nuclear Generating Unit No. 2, Fire Protection.

The inspection was conducted by a team of regional specialists and a resident inspector. The inspection identified three green findings, all of which were non-cited violations, and one unresolved item. The significance of most findings is indicated by their color (Green, White, Yellow, Red) and was determined using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

- Green. Based on the review of test reports CTP-1026 and CTP-1077, the team determined that the results of the engineering test alone were inconclusive for qualifying the fire barrier system as a one hour rated fire barrier. The team noted that ConEd had only credited the Hemyc fire barrier on the 23 ABFP for 30 minutes, however, due to identified test discrepancies, the 30 minute rating was also inconclusive. This issue is unresolved pending further NRC review to determine whether the qualification tests of the Hemyc fire barrier wrap systems are acceptable.
  (URI 05000247/2000-004-01)

- Green. The team determined that the 100 feet long fire hoses on the primary and secondary hose reels for central control room (CCR) were too short to reach all areas of the CCR. ConEd took immediate corrective action to stage additional hose lengths near the primary hose station for the CCR, and documented the deficiency in the corrective action program. The failure to be able to reach all areas of the CCR with 100 feet length fire hose is a violation of the Fire Protection Program Plan, which is incorporated into the operating license, by reference, in License Condition 2.K. The significance determination process characterized this condition as being of very low risk significance because the control room is continuously manned, and most fires would be detected and extinguished at the incipient stage using portable extinguishers. This violation of the operating license is being treated as a Non-Cited Violation **(NCV 050000247/2000-004-02**), consistent with Section VI.A. of the Enforcement Policy.

- Green. The team found that the remote control switches, and their associated wiring, in Unit 1 control panel board located in the CCR of several 13.8 kV light and power breakers (SB1-2, SB1-3, SB1-T, SB2-2 and GT-1) of Alternate Safe Shutdown System (ASSS) power supply were not capable of being isolated from central control room circuit wiring, an area for which the system is credited. This is contrary to section III G.3 of Appendix R. In the event of a fire in the control room, the control of these breakers could be adversely affected and the alternate safe shutdown power relied upon could become unavailable.

No procedural steps exist to recover these breaker functions. ConEd entered this deficiency into the corrective action program on April 13, 2001, to address this issue. The team determined that this issue was of very low risk significance (Green). This violation of 10 CFR 50, Appendix R, section III.G.3 requirement, not providing adequate isolation of circuits from the central control room, is being treated as a non-cited violation **(NCV 050000247/2000-004-03)**, consistent with Section VI.A. of Enforcement Policy.

Report Details

Background

This report presents the results of a triennial fire protection team inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05, "Fire Protection." The objective of the inspection was to assess whether ConEd has implemented an adequate fire protection program and whether post-fire safe shutdown capabilities have been established and are being properly maintained. Fire zones were selected for detailed review based on risk information in the Individual Plant Evaluation for External Events (IPEEE). Fire zones chosen for the inspection were Fire Zone 2A-Primary Water Makeup Pump Area, Fire Zone11-Cable Spreading Room, Fire Zone 14-Switchgear Room, Fire Zone 74A-Electrical Penetration Area, and Fire Zone 23-Auxiliary Feedwater Pump Room.

This inspection was a reduced scope inspection in accordance with the September 22, 2000, revision to IP 71111.05, "Fire Protection." Issues regarding equipment malfunction due to fire-induced failures of associated circuits were not inspected. Criteria for review of fire-induced circuit failures are currently the subject of a voluntary industry initiative. The definition of associated circuits of concern used was that contained in the March 22, 1982, memorandum from Mattson to Eisenhut, which clarified the requests for information made in Generic Letter 81-12.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems

1R05 Fire Protection

.1 Programmatic Controls

a. Inspection Scope

During tours of the Indian Point Nuclear Generating Unit No. 2 (IP2) facility, the team observed the material condition of fire protection systems and equipment, the storage of permanent and transient combustible materials, and control of ignition sources. The team also reviewed the procedures that controlled hot-work activities and combustibles at the site. This was accomplished to ensure that the licensee was maintaining the fire protection systems, controlling hot-work activities, and controlling combustible materials in accordance with their fire protection program.

b. Findings

No findings of significance were identified.

.2 Fire Barrier Penetration Seals

a. Inspection Scope

The team randomly selected three fire barrier penetration seals for detail inspection to verify proper installation and qualification. The team reviewed associated design drawings, B & B Insulation, Inc. test reports, and surveillance procedures. The team compared the observed in-situ seal configurations to the design drawings and tested configurations. Additionally, the team compared the penetration seal ratings with the ratings of the barriers in which they were installed. This was accomplished to ensure that the licensee had installed the selected penetration seals in accordance with their design and licensing bases.

b. Findings

No findings of significance were identified.

.3 Post-Fire Safe Shutdown Emergency Lighting

a. Inspection Scope

The team observed the placement and aim of emergency lighting units (ELUs) throughout the selected fire zone to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation for post-fire shutdown.

b. Observations and Findings

No findings of significance were identified.

.4 Electrical Raceway Fire Barrier Systems

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries, fire doors, and fire dampers. Additionally, the team reviewed design and installation drawings, engineering evaluations, surveillance and functional test procedures for selected items. The NRC safety evaluations of fire protection features for IP2 was also reviewed by the team. The design and qualification testing for raceway fire barriers were also reviewed and a walkdown of installed barriers was performed for the selected areas. This review was performed to ensure that the selected items of the fire barrier system met their design and licensing bases.

b. Findings

Raceway Protection

10 CFR 50.48(b) states that for nuclear power plants licensed to operate prior to January 1, 1979, fire barriers installed to protect the post-fire safe shutdown capability, whether installed before or after 10 CFR 50 Appendix R became effective, are required to satisfy the technical requirements of Section III.G of 10 CFR 50 Appendix R. This section requires, in part, that raceway enclosures utilized in areas with fire detectors and automatic suppression shall have a one-hour fire rating. Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," presents acceptable methods for satisfying the technical requirements of Appendix R, including guidance for fire barriers. GL 86-10 states that the documentation establishing the rating of a fire barrier should include the design description of the barrier and the test reports that verify its rating. The GL also provides the fire test acceptance criteria for establishing the fire rating of a barrier.

At IP2, Hemyc wrap has been utilized to protect selected raceways to meet the separation requirements of 10 CFR 50, Appendix R. The Hemyc design is typically a 1½-inch nominal alumina silicate fiber (a Kaowool type material) blanket encapsulated in Siltemp 84 fabric on the outside (side exposed to the fire) and a Klevers 600/6 fiberglass mat on the inside. Within the areas selected for inspection, Hemyc was installed to protect the power supply conduits for the 23 auxiliary boiler feedwater pump (ABFP). Since Hemyc fire barriers were installed after the effective date of Appendix R, they are required to meet the technical requirements of Appendix R or have appropriate documentation to justify a deviation.

The team reviewed the following qualification test documentation utilized by ConEd as the bases for qualifying the Hemyc system as a 30 minute fire barrier for raceways:

- Insulation Incorporated Test CTP-1026, "One Hour Qualification Test Protective Envelopes for Class 1E Electrical Circuits (Hemyc Cable Tray and Conduit Wrap System)," Rev.1, May 25, 1982.

- Promatec, Inc. Analysis of Test CTP-1077, "One (1) Hour Fire Test on 3" Conduit," February 24, 1986.

Test Report CTP-1026 provides the results of three tests designed to establish the one hour rating for raceway barriers. Consolidated Edison did not evaluate Test No. 1 because it was focused toward cable tray installations. Test Nos. 2 and 3 were utilized because they protect 4 inch conduit which is utilized at IP2. The team reviewed testing for the configurations that were most representative of the IP2 plant installation inspected by the team.

Test No. 1 included two 12-inch ladder-back cable trays stacked with eight inches of air gap between the trays. The top tray had 100% cable fill consisting of equal fills of 300 MCM cables, seven conductor No. 12 American Wire Gage (AWG) cables, and two conductor No. 16 AWG cables. The lower cable tray had a single layer of cables of the

same ratio and types as in the top tray. The cable trays were enclosed in a single fire barrier enclosure consisting of an inner fiberglass cloth wrap, a single layer of 1½-inch Kaowool blanket installed over a steel framework that provided a minimum 2-inch air gap between the wrap and the trays and an outer layer of Siltemp fabric. This configuration was not utilized at IP2.

Test No. 2 consisted of a single 12-inch ladder-back cable tray with a single layer of cabling consisting of equal volumes of the same type cables utilized in Test No. 1. Additionally, two 4 inch conduits with 100% cable fill was protected by a stand-off with a 1½ inch thick barrier (air space between barrier and conduit). This cable tray and conduit was wrapped in the same manner as in Test No. 1.

Test No. 3 included a cable tray installation similar to that in Test No. 2 except with a 100% cable fill. This test also included a single 4-inch conduit with 100% cable fill. The conduit fire barrier system consisted of a 2-inch thick barrier directly applied to the conduit (no airspace between the barrier and the conduit).

These tests were conducted in accordance with ANI/MAERP "Standard Fire Endurance Test Method to Qualify a Protective Envelope for Class 1E Electrical Circuits." NRC Generic Letter 86-10 specified ASTM E-119, "Standard Test Methods for Fire Tests of Building Construction and Materials," as the acceptable testing method. Testing to the insurance standard rather than to ASTM E-119 presented the following concerns:

- ASTM E-119 is specific as to the type of thermocouple to be used in the testing, specifically fusion welded No. 18 AWG Chromel-Alumel wire. Test Report CTP-1026 states that **?**Pt (Platinum), Pt-Rd (Platinum-Rhodium)" thermocouples were used which could affect the time delay and accuracy of the measurement used to determine the furnace temperature profile.

- ASTM E-119 requires a minimum of nine thermocouples distributed throughout the furnace to control the test fire curve. The thermocouples must also be mounted in minimum 12-inch long protective tubing and distributed throughout the furnace. This practice is necessary to confirm that the furnace has a uniform heat flux and is exposing all faces of the test article. Test CTP-1026 used only one thermocouple and one "reserve" thermocouple, both of which were located in the back of the furnace to control the test curve.

- ASTM E-119 requires that the minimum furnace be sized to test a 100 ft^2 sample. The furnace used in the test was only approximately 33 ft^2.

- ASTM E-119 requires thermocouples to be located on the cold-side surface of the barrier to measure at least nine separate points with an acceptance criteria that the temperature rise does not exceed 250 ^oF over the ambient starting temperature. The team found that the number and location of thermocouples may not have been sufficient to obtain an accurate thermal profile of the raceways. Specifically, Test Nos. 1, 2, and 3 utilized six, nine, and ten thermocouples, respectively and the test report did not state specifically where the thermocouples were located. Sketches

included in the report indicated the thermocouples for Test No. 1 were located on the inside of the cable trays attached to cables with one thermocouple buried in the 100% filled tray and Test No. 2 had three thermocouples installed on cables located in the bottom of the tray and three located on the top of the tray. Additionally, two thermocouples were located inside of the 4 inch conduit pair. Test No. 3 provided nine thermocouples in the cable tray and one thermocouple in the 4 inch conduit.

The team identified several concerns regarding the measured temperatures. For example, during Test No. 1, all six recorded temperature rises were within that allowed by ASTM E-119. However, since the test configuration consisted of two cable trays inside the fire barrier system, including one with heavy (100%) fill which provided a significant thermal heat sink, the results may not bound the single, less than fully filled tray configuration. Also, during Test No. 2, the temperatures of the thermocouples on the bottom of the tray exceeded the average allowable temperature rise at approximately 38 minutes and the temperature plot for the three thermocouples located on cables in the top of the tray stopped at 55 minutes, corresponding to a temperature rise of 250 ^{o}F. Additionally, the thermocouples located on the inside of the 4 inch conduit pair exceeded the allowable temperature rise in approximately 42 minutes. During Test No. 3, the single 4-inch conduit exceeded the allowable temperature rise at approximately 42 minutes and readings for all of the thermocouples in the 12-inch cable tray remained below the maximum allowable temperature.

Finally, the team noted that the potential effects of raceway supports on the test results appeared to be beyond the scope of all three of the tests, as the report does not discuss their interface or protection requirements. There were no thermocouples on or near supports to determine their impact on the temperature rise inside the fire barrier systems.

The team also reviewed Test Report CTP-1077 which was a one-hour test on a three-inch conduit. The team noted that the report introduction states that, “This report consists of an analysis of the one-hour fire exposure test performed on October 29, 1984, as an engineering test during the performance of a standard three-hour fire test on a different system. It is fully realized that this test is an engineering test only, and it does not qualify as a fully acceptable one-hour test. The purpose of this report is to analyze the data collected, determine the weak points, and recommend configurations for future evaluations.”

The test specimen consisted of a three-inch conduit with two 300 MCM cables, four No. 12 AWG seven conductor and eleven No. 16 AWG two conductor poly vinyl chloride (PVC) jacketed cables resulting in a 50% fill. The team identified similar concerns to those discussed above, with this test method as compared to ASTM E-119, including:

- The analysis does not provide sufficient information to determine the type of thermocouples that were used in the test.

- The test used only six thermocouples to measure internal barrier temperatures, of which, one appears to have failed at approximately four minutes into the test.

- The furnace used in the test was not described sufficiently to evaluate compliance with the standard.

- The test report does not state exactly where the thermocouples were attached to the test specimen.

The team noted that the Hemyc installation inspected at IP2 was in good condition. However, based on the review of test reports CTP-1026 and CTP-1077, the team determined that the results of the engineering test alone were inconclusive for qualifying the fire barrier system as a one hour rated fire barrier. The team noted that ConEd had only credited the Hemyc fire barrier on the 23 ABFP for 30 minutes, however, for the same reasons indicated above, the 30 minute rating was also inconclusive.

The NRC has previously identified similar Hemyc qualification test issues at the Shearon Harris Nuclear Power Plant (IR 50-400/99-13) and the NRC Region II office requested the Office of Nuclear Reactor Regulation (NRR) assistance in Task Interface Agreement (TIA) 99-028, dated November 23, 1999, in evaluating the resolution of these items. This issue is unresolved pending further NRC review to determine whether the qualification tests of the Hemyc fire barrier wrap systems are acceptable.
(URI 05000247/2000-004-01)

.5 Fixed Fire Suppression Systems

a. Inspection Scope

The team reviewed the adequacy of the manual Halon suppression system in the cable spreading room by performing a walkdown of the system, review of initial discharge testing, and review of functional testing. In addition, the team verified the Halon system functionality and the adequacy of surveillance procedure testing by reviewing several completed surveillance procedures. Additionally, the team reviewed the main transformer deluge system surveillance procedures to ensure functionality of the fire dampers in the outside wall of the switchgear room. This review was performed to ensure that the selected fixed suppression systems met their design and licensing bases.

b. Findings

No findings of significance were identified.

.6 Manual Fire Suppression Equipment

a. Inspection Scope

The team walked down selected standpipe systems and portable extinguishers to determine the material condition of manual fire fighting systems. Electric fire main booster pump flow, diesel fire pump flow, and pressure tests were also reviewed by the team to ensure the pumps were meeting design requirements. Additionally, the team reviewed recent fire main loop flow tests and a standpipe calculation to ensure adequate flow and pressure could be delivered to hose and sprinkler systems.

The team inspected the fire brigade's protective ensembles, self-contained breathing apparatus (SCBA), portable communications equipment and various other fire brigade equipment to determine material condition and operational readiness of equipment for fire fighting.

b. Findings

Based on the review of the pre-fire plan for the central control room (CCR) and walkdowns of the area, the inspectors determined that the 100 feet long fire hoses on the primary and secondary hose reels for CCR were too short to reach all areas of the CCR. ConEd took immediate corrective action to stage additional hose lengths near the primary hose station for the CCR, and documented the deficiency in the corrective action program as CR 200103696. The approved fire protection program, as described in Section 3.1.7 of the January 31, 1979, Safety Evaluation Report states that all areas containing safety-related equipment may be reached and adequately covered with a maximum of 100 feet of fire hose. The failure to be able to reach all areas of the CCR with 100 feet length fire hose is a violation of the Fire Protection Program Plan, which is incorporated into the operating license, by reference, in License Condition 2.K.

The significance determination process characterized this condition as being of very low risk significance because the control room is continuously manned, and most fires would be detected and extinguished at the incipient stage using portable extinguishers. The SDP evaluation used the fire ignition frequency from the IP2 IPEEE for a fire in any panel requiring CCR evacuation. Manual fire fighting capability was considered highly degraded in accordance with the guidance on evaluating Manual Fire Suppression Equipment and Systems contained in Attachment 2, to Appendix F to IMC 0609.

This violation of the operating license is being treated as a Non-Cited Violation **(NCV 050000247/2000-004-02**), consistent with Section VI.A. of the Enforcement Policy.

.7 Communications

a. Inspection Scope

The team reviewed ConEd's portable radio system transponder location and discussed portable radio communication with the fire brigade training instructor to determine if

communications could be maintained in the event of a fire at the site. Additionally, the team reviewed radio system maintenance to determine if ConEd was properly maintaining the radio system.

b. Findings

No findings of significance were identified.

.8 Fire Detection Systems

a. Inspection Scope

The team performed a walkdown of the selected fire zones to verify the existence and adequacy of fire detection in the selected fire zones. In addition, the team reviewed completed surveillance procedures and smoke detection installation system drawings to verify the adequacy and frequency of fire detection component testing. This review was performed to ensure that the fire detection systems for the selected fire zones met their design and licensing bases.

b. Findings

No findings of significance were identified.

.9 Operational Implementation of Alternative Shutdown Capability

a. Inspection Scope

The team reviewed Abnormal Operating Instruction (AOI) 27.1.9 “Control Room Inaccessibility Safe Shutdown Control,” which directs the operator actions in the event of inaccessibility of the central control room (CCR) or damage outside the CCR which would render the normal CCR controls or indications unreliable. The purpose of this review was to determine if appropriate information is provided to plant operators to identify protected equipment and instrumentation and if recovery actions specified in post-fire shutdown procedures consider manpower needs for performing restorations and area accessibility. The team also reviewed qualification practical factors for reactor operators and job performance measures for the alternative shutdown actions, discussed training with licensed operators and non-licensed operators, reviewed the Appendix R locker surveillance, reviewed minimum shift manning required by technical specifications, evaluated the accessibility of the alternative shutdown operating stations and the accessibility of required manual action locations, and reviewed the pre-fire plans for select areas.

b. Findings

No findings of significance were identified.

.10 Alternate Safe Shutdown Design

a. Inspection Scope

The team reviewed the Updated Final Safety Analysis Report (UFSAR), Appendix B of Updated Fire Hazards Analysis (DC-85-101, Revision 1), and the Design Basis Document (DBD) of Fire Protection/Appendix R-Alternate Safe Shutdown System (ASSS), Rev. 0, to evaluate the methods and equipment used to achieve hot shutdown following postulated fires in the primary water makeup pump area, the cable spreading room, the switchgear room, the electrical penetration area, and selected portions of main control room fire areas. The team further reviewed piping and instrumentation drawings (P&IDs) for post-fire safe shutdown systems to determine required components for establishing flow paths, identify equipment required to isolate flow diversion paths, and verify appropriate components were on the alternate safe shutdown equipment list. The team also performed field walk-downs to validate the equipment location determinations used in the analysis.

The team reviewed electrical and control drawings for the Indian Point Nuclear Generating Unit 1(IP1) gas turbine 1 (GT-1) and applicable circuit breakers required to supply power to IP2 safe shutdown (SSD) equipment (for certain fire areas, an independent onsite power supply from IP1 auxiliaries GT-1 is hard wired to manually operated switches to power one train of the safe shutdown components). The team also reviewed the calibration and testing of protective devices of ASSS power distribution system and control and monitoring instruments of a remote alternate safe shutdown panel to ensure that proper isolation was provided for alternate shutdown capability for fires in the central control room and other fire areas. The team conducted field walk-downs to evaluate the protection of the equipment from the effects of fires. The team also reviewed alternate independent power supply manual switches and remote alternate safe shutdown panel operability test procedures and observed a test of alternate safe shutdown supply to service water pump 24 (PT-Q17E) to determine if the licensee was appropriately testing the applicable power and transfer switch functions.

The team also reviewed the capability of the ASSS power distribution system including the safety equipment terminal voltage and electrical devices and circuit breaker coordination to ensure that equipment needed for a post-fire safe shutdown would not be impacted due to a lack of adequate voltage and coordination. The team reviewed the progress of work being performed under CR 20013708 to formally document the required information. The team also reviewed testing and preventive maintenance procedures for the IP1 gas turbine and applicable power distribution circuit breakers to determine if the licensee was appropriately maintaining them in a state of readiness. These procedures were reviewed to determine if the circuit breakers that provide electrical power and provide protection to post-fire safe shutdown components could operate when called upon.

b. Findings

The team identified a deficiency in the control circuit wiring of ASSS power supply circuit breakers. 10CFR 50, Appendix R, section III.G.3, requires that alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room or zone shall be provided. The team found that the remote control switches and their associated wiring in unit 1 control panel board located in Unit 2 control room of several 13.8 kV light and power breakers (SB1-2, SB1-3, SB1-T, SB2-2 and GT-1) of ASSS power supply were not separated from central control room circuit wiring, an area for which the system is credited. This is contrary to section III G.3 of Appendix R. In the event of a fire in the control room the control of these breakers could be adversely effected and the alternate safe shutdown power relied upon could become unavailable. Based on the existing conditions and the established abnormal operating procedure AOI 27.1.9 (shutdown outside control room), no steps exists to recover these breaker functions. ConEd entered this deficiency into their corrective action program as Condition Report 2001-03730 on April 13, 2001, to address this issue. The team determined that this issue was more than minor because enough combustible material was present in the vicinity of the Unit 1 control panel to challenge the panel's wiring, potentially resulting in a loss of alternate shutdown power supply to post-fire safe shutdown equipment.

The team determined that this issue was of very low risk significance (Green) because of the small likelihood of a fire occurring which would necessitate evacuation of the CCR. The SDP Evaluation used the fire ignition frequency from the IP2 IPEEE for a fire in any panel requiring CCR evacuation. Manual fire fighting capability was considered highly degraded, in accordance with the guidance on evaluating Manual Fire Suppression Equipment and Systems contained in Attachment 2, to Appendix F, to IMC 0609. This violation of 10CFR 50, Appendix R, section III.G.3 requirement, not providing adequate isolation of circuits from the central control room, is being treated as a non-cited violation (**NCV050000247/2000-004-03**), consistent with Section VI.A. of Enforcement Policy.

.11 Safe Shutdown Circuit Analyses

a. Inspection Scope

The team reviewed the IP2 Fire Hazard Analysis (FHA) to assess the adequacy of the methodology applied in the analysis. The team also reviewed the power and control cable routing for selected risk-significant post-fire safe shutdown components to determine if the cables were properly routed outside the fire areas of concern or protected against the effects of the postulated fires. The team also walked down certain portions of cable routing to confirm that the cables required for an alternate safe shutdown would not be impacted by the postulated fires.

Due to the issuance of Change Notice 00-020 against Inspection Procedure 71111.05, "Fire Protection," the team did not review associated circuit issues during this inspection. This change notice has suspended this review pending completion of an industry initiative in this area.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA4 Other

.1 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team reviewed Quality Assurance audits of the fire protection program, the self-assessment of the fire protection program performed by ConEd in January 2001, and selected condition reports affecting fire protection or safe shutdown equipment to evaluate the ability of ConEd to identify and resolve fire protection program and equipment deficiencies.

b. Findings

No findings of significance were identified.

4OA5 Management Meetings

.1 Exit Meeting Summary

The inspectors presented their preliminary inspection results to Mr. A. Alan Blind and other members of the ConEd staff at an exit meeting on April 13, 2001.

The inspectors asked whether any materials examined during the inspection should be considered proprietary. No information was identified as being proprietary.

KEY POINTS OF CONTACT

Consolidated Edison Company of New York, Inc.

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J. Baumstark, Vice President-Nuclear Engineering
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P. O'Brien, Manager, Site Engineering Programs
T. Jones, Senior Licensing Engineer
M. Stroppel, Senior Instructor, Operations Training
M. Ruh, Fire Marshall, Generation Support
G. Dahl, Fire Protection Engineer
P. Griffith, PSA Engineer
J. Cottam, Fire Protection Specialist
P. Speedling, Fire Protection Specialist
T. Klein, Senior Technical Specialist, Design Engineering
S. Toth, Sr. Licensing Engineer
L. Kleinsorg, Contract Fire Protection Engineer
K. Elliot, Contract Fire Protection Engineer

Nuclear Regulatory Commission

J. Linville, Chief, Electrical Engineering Branch, DRS
D. Frumkin, Fire Protection Engineer, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

NCV 050000247/2000-004-02	Failure to have adequate length of fire hose staged for manual fire fighting in the central control room
NCV 050000247/2000-004-03	Failure to provide adequate isolation of circuits from the central control room

Opened

URI 05000247/2000-004-01	Adequacy of Hemyc Cable Wrap Fire Barrier Qualification Test and Evaluation

Closed

None

Discussed

None

LIST OF ACRONYMS

ABFP	Auxiliary Boiler Feedwater Pump
ANI	American Nuclear Insurers
AOI	Abnormal Operating Instruction
ASSS	Alternate Safe Shutdown System
ASTM	American Society for Testing and Materials
AWG	American Wire Gage
CCR	Central Control Room
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
ConEd	Consolidated Edison Company of New York, Inc.
CR	Condition Report
DBD	Design Basis Document
ELU	Emergency Lighting Unit
IN	Information Notice
GL	Generic Letter
IMC	NRC Inspection Manual Chapter
IP	Inspection Procedure
IP1	Indian Point Nuclear Generating Unit No. 1
IP2	Indian Point Nuclear Generating Unit No. 2
IPEEE	Individual Plant Evaluation for External Events
IR	Inspection Report
JPM	Job Performance Measure
LER	Licensee Event Report
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PCV	Pressure Control Valve
PVC	Poly Vinyl Chloride
SCBA	Self Contained Breathing Apparatus
SDP	Significance Determination Process
SER	Safety Evaluation Report
TIA	Task Interface Agreement
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item

LIST OF DOCUMENTS REVIEWED

Fire Protection Program Documents

Indian Point Unit 2 Fire Protection Program Plan, Rev. 9
Appendix A - Updated Responses to the Guidelines of BTP95-1. Appendix A
Appendix B - Updated Fire Hazards Analysis

Piping and Instrumentation Drawings

A227551, Rev. 52, Sh. 1 "Fire Protection System Diagram"
A227552, Rev. 32, Sh. 2 "Fire Protection System Diagram"
A227553, Rev. 44, Sh. 3 "Fire Protection System Diagram"
A227554, Rev. 21, Sh. 4 "Fire Protection System Diagram"
9321-F-4006, Rev. 58 "Yard Fire Protection Piping"

Control Circuit Schematics

Calculations

PGI-00460, Rev. 0, "Evolution of High Pressure Fire Water Supply System"
FEX-00129-00, "Ampacity of 13.8 kV Feeders 13W92, 13W93, and 13W94"

Procedures

EOP FR-H.1, Rev. 33, "Response to Loss of Secondary Heat Sink"
AOI 27.1.9, Rev. 29, "Control Room Inaccessibility Safe Shutdown Control"
AOI 27.1.8, Rev. 3, "Fire Affecting Indications or Controls in the Central Control Room or Loss of Annunciators"
SAO-700, Rev. 6, "Fire Protection and Prevention Policy"
SAO-701, Rev. 9, "Control of Combustibles and Transient Fire Load"
SAO-702, Rev. 7, "Control of Ignition Sources"
SAO-703, Rev. 8, "Fire Protection Impairment Criteria and Surveillance"
SAO-704, Rev. 4, "Removal/Reinstallation Fire Rated Assemblies"
SAO-705, Rev. 7, "Fire Watch/Fire Watch Tour"
SAO-706, Rev. 6, "Fire Brigade Organization, Operation, and Training"
SAO-707, Rev. 7, "Fire Emergency"
ELT-B-001-A, Rev. 11, "Teledyne (Big Beam) Emergency Lights Repair/Replacement"
MGS-P-002-N, Rev. 3, "Inspection and Cleaning of #11, #12, and #13 Motor Generator Sets Non-Class "A"
PI-M5, Rev. 9, "Alternate Shutdown System Cabinet Inventory"
PMT-14654, Test No. 6, "21 Main Transformer Deluge Dampers"
PT-A22, Rev. 2, "Fire Loop Flow", 4/28/94
PT-A22, Rev. 3, "Fire Loop Flow", 1/22/98
PT-A23, Rev. 8, "Fire Main Booster Pump Capacity", 5/28/98
PT-A23, Rev. 7, "Fire Main Booster Pump Capacity", 5/31/98
PT-A23, Rev. 8, "Fire Main Booster Pump Capacity", 3/27/00

PT-A23, Rev. 8, “Fire Main Booster Pump Capacity”, 3/31/00
PT-A40, Rev. 3, “Diesel Driven Fire Pump Capacity”, 11/26/99
PT-A40, Rev. 4, “Diesel Driven Fire Pump Capacity”, 9/22/00
PT-A28, Rev. 6, “Emergency Light Battery Integrity”
PT-EM19, Rev. 5, “Cable Spreading Room Halon System”
PT-M49A, Rev. 14, “Appendix R Emergency Lighting (Conventional)”
PT-M49B, Rev. 9, “Test and Performance Appendix R Emergency Lighting”
PT-R36A, Rev. 0, “Main Transformer #21 Water Deluge System”
PT-R36A, Rev.1, “Main Transformer # 21 Water Deluge System”
PT-SA12A, Rev. 5, “Ionization Type Smoke Detector”
PT-SA13, Rev. 8, “Cable Spreading Room Halon System”
PC-R37, Rev. 9, “Alternate Shutdown Instruments”

Modification Documents

MA-01-001, Rev. 0 “IP2 Evaluation of Hemyc Cable Raceway Fire Barriers”

Training Materials

JPM-084002051 “Perform a Reactor Trip from the 480V and 6.9 KV Switchgear”
JPM-0840130402, “Align 23 Charging Pump for Safe Shutdown Power and Local Control”
JPM-0840030401, “Start #21 ABFP Pump from Safe Shutdown Power Supply”
TPD 406-QA, “Qualification Card Practical Factors,” Revision 0
Fire Drill Scenario 011, “Cable Spreading Room 33' Elevation Control Building”
Fire Drill Report Evaluation, “Cable Spreading Room Conducted 3/10/01 and 2/21/01"

Completed Tests/Surveillances

PI-M5, “Alternate Safe Shutdown System Cabinet Inventory,” Revision 9, Complete 02/20/01
PI-M5, “Alternate Safe Shutdown System Cabinet Inventory,” Revision 9, Complete 03/17/01
PT-Q17E, “Verification of Alternate Safe Shutdown Supply to 24 SWP,” Complete 04/10/01

Corrective Action Program Documents

CR 199802561	CR 199901658	CR 200101298	CR 200102616
CR 199804493	CR 200001925	CR 200102360	CR 200103560
CR 199810141	CR 200002162	CR 200102364	CR 200103562
CR 199810350	CR 200002293	CR 200102366	CR 200103591

CR 200103601	CR 200103708
CR 200103604	CR 200000499
CR 200103696	CR 200002162
CR 200103697	CR 200101400
CR 200103680	CR 200101850

Work Orders

WO NP9471048
WO NP9794213
WO NP0119852
WO NO0014142

Miscellaneous Documents

System Description No. 32.0 “Alternate Safe Shutdown System,” Revision 1
SE-SQ-12.401, “Pre-Fire Plans,” Revision 3
SAO 701, “Fire Protection Tour Checklist”, 3/28/01
SAO 701, “Fire Protection Tour Checklist”, 3/27/01
SAO 701, “Fire Protection Tour Checklist”, 3/26/01
SAO 701, “Fire Protection Tour Checklist”, 3/9/01
SAO 701, “Fire Protection Tour Checklist”, 3/2/01
SAO 701, “Fire Protection Tour Checklist”, 3/1/01
SAO 701, “Fire Protection Tour Checklist”, 2/27/01
SAO 701, “Fire Protection Tour Checklist”, 2/22/01
SAO 701, “Fire Protection Tour Checklist”, 2/16/01
SAO 701, “Fire Protection Tour Checklist”, 2/14/01
SAO 701, “Fire Protection Tour Checklist”, 2/8/01
TS-TP-0006, April 1978, “Fire and Hose Stream Tests of Penetration Seal Systems”
Vendor Manual 117-0423-1083, 6/17/88, “Instruction Manual, (Important Safeguards) Big Beam Model No. 2TCGL100P2"
CI-240-1, Supplement 2, “Quality Assurance for Fire Protection”
CI-240-1, Attachment 1, “Quality Assurance Plan”
CTP-1009 and 1011, August 28, 1981, “Three Hour Fire Qualification Test, 9" Depth 3-6548 Silicone RTV Foam with Site Specific SNUPPS Cable and Repair”
CTP1001A, July 25,1980, “Three Hour Fire Qualification Test, 10" and 6" Depth Silicone RTV Foam”
CTP-1026, May 25, 1982, “One Hour Qualification Test Protective Envelopes for Class 1E Electrical Circuits (Hemyc Cable Tray and Conduit Wrap System)”
CTP-1077, Feb. 1986, “One (1) Hour Fire Test on 3 inch Conduit”
CTP-2005, Project # 8610-102473, “Fire Endurance Test of 3M Interam Mat. Fire Protective Envelopes (5 in., 3 in., and 1 in. Conduits and 12 in.x12in.x8in. Junction Box)”
CTP-2008, Project # 8610-102473, “Fire Endurance Test of 3M Interam Mat. Fire Protective Envelope (21"Wide x 39"High x 54"Deep Box Design)”
Fire Impairment Log, April 10, 2001
ICCO483032, May 1983, “Construction Technology Laboratories, Fire and Hose-Stream Tests for Penetration Seal Systems”

Miscellaneous Drawings

A138267, Rev. 32, “Unit 1 One Line Diagram 120/208V System”
A138908, Rev. 21, “Unit 1 Diagram for 120/208V Power Distribution Panels and Distribution Panels MG-1, MG-2, 5A-1D, and 5A-2D”
13852, Rev. 9, “Unit 1 Diagram of Connections of Special A-C Backup Load Boards #1 and #2"
138910, Rev. 9, “External Diagram of Connections 125VDC Battery, M-G Sets, Rectifiers and Control Cubicles”
138379, Rev. 23, “Unit 1 Oneline Diagram 125VDC System”
140997, Rev. 19, “Unit 1 Oneline Diagram Special AC Backup For Nuclear Plant
B219724, Rev. 2, Elevator Machinery/Radio Room 120VAC Oneline and Panel Schedule”
B219729, Rev. 1, “Unit 1 Elevator Machinery/Radio Room Conduit and Tray Plan, Section and Details”
B227992, Rev. 9, “Fire Barrier Penetrations Wall 11/IP1-5 Cable Spreading Room/I.P.1"
B227999, Rev. 3, “Fire Barrier Penetrations SWGR Room Barriers: 14/43-W.”
B228009, Rev. 4 , “Plan View of Fire Barrier-Aux. Feed Bldg. EL 32' 6" Barrier 60A/23"
B228045, Sheet 1, Rev. 3, “Fire Barrier Penetration Schedule Wall 11/IP1-5"
B228051, Sheet 1, Rev. 6, “Fire Barrier Penetration Schedule Floor 60A/23"
B228053, Rev. 4, “Fire Barrier Penetration Schedule Walls 14/ST3-S, 14/43A-W”
B229702, Rev. 1, “Installation of Fire Wrap for Safe Shutdown”
D-8775, Sheet 1, Rev. 2, “Halon System Cable Spreading Room”
D-8775, Sheet 2, Rev. 4, “Halon System Cable Spreading Room”
D-8775, Sheet 3, Rev. 3, “Halon System Cable Spreading Room”
D-8775, Sheet 6, Rev. 2, “Halon System Cable Spreading Room”
9321-1326-05, 5/21/97, “Installation of 3M Interam E54A MAT Passive Fire Protection System for Penetration H-20"
A138040-52, “One Line Diagram 13.8 kV & 440V System” (Unit 1)
312901-02, “One Line Diagram Gas Turbine Gen. # 1" (Unit 1)
244016-15, “One Line 440VAC SWGR Unit-Substation’s 11RW1, 12RW3, 12FD3, MCC’s 10M, 10N & 10X”
115R302, Sheets 7,8,9 and 12, “Bus Section No. Power & Control Circuits for Incoming Line-Unit 2-2"
138924-4, “External Diagrams of Connection’s 13.8 kV L&P Switchgear Bus Sections No. 1, 2 and Bus Ties”
138358-4, “Schematic Diagram River Water Service Pumps # 23 and 24"
138503-8, “Schematic Diagram of Forced Draft Fan Substations 11FD1 & 12FD3"
138548-3, “Schematic Diagram Relay Protection of 13.8 kV Indoor Light and Power Aux Bus”
138647-6, “Typical Splice Arrangement of Gas Filled Cables for 13.8 kV Feeders in Splice Box”
138371-8 , “13.8 kV Conduit Run Under Elevation 33 feet Column 3 to 8 and Column E to L-Plan”
138839-5, “Cable Schedule 13.8 kV Power “
138379-23, “One Line Diagram 125 V D-C System”
138507-15, “External Diagrams of Connection’s for 125 V DC Distribution Panels 1, 2, & 3"
A250907-16, “Indian Point Electrical Distribution and Transmission System”
A208088-34, “One Line Diagram of 480 VAC SWGRS 21& 22, Bus 2A, 3A, 5A & 6A”
IP2-S-001000-01, “Schematic Wiring Diagrams for Alternate Safe Shutdown Source Range Monitor”
IP2-S-001001-01, “Schematic Wiring Diagrams for Alternate Safe Shutdown Hot and Cold Leg RTD’s Instrumentation”
A227068-1, “D/C for Alternate Safe Shutdown System Source Range Monitor Hot and Cold Leg RTD’s”