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November 10, 1998

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

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555-0001

SUBJECT: 10 CFR 50.54 (f) Response to NRC Generic Letter 98-04: "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment"

Pursuant to 10 CFR 50.54 (f), this letter and attachment (Attachment A) constitute Consolidated Edison Company of New York, Inc.'s (Con Edison's) 120-day written response to the subject generic letter.

Generic Letter 98-04, dated July 14, 1998, was issued to alert addressees to problems associated with the material condition of Service Level 1 protective coatings inside the containment and to request information to evaluate the addressees' programs for ensuring that Service Level 1 protective coatings inside containment do not detach from their substrate during a DB LOCA and interfere with the operation of the ECCS and the safety-related CSS.

The commitments made in this correspondence are provided in Attachment B. Should you or your staff have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety & Licensing.

Very truly yours,

A084

Attachment

Subscribed and sworn to
before me 10th day
of November 1998.

130069

Karen L. Lancaster
Notary Public

KAREN L. LANCASTER
Notary Public, State of New York
No. 60-4643659
Qualified In Westchester County
Term Expires 9/30/99

C: Mr. Hubert J. Miller
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ATTACHMENT A

Response to Generic Letter 98-04:

Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
November 1998

Required Information

(1) A summary description of the plant-specific program or programs implemented to ensure that Service Level 1 protective coatings used inside the containment are procured, applied, and maintained in compliance with applicable regulatory requirements and the plant-specific licensing basis for the facility. Include a discussion of how the plant-specific program meets the applicable criteria of 10 CFR Part 50, Appendix B, as well as information regarding any applicable standards, plant-specific procedures, or other guidance used for: (a) controlling the procurement of coatings and paints used at the facility, (b) the qualification testing of protective coatings, and (c) surface preparation, application, surveillance, and maintenance activities for protective coatings. Maintenance activities involve reworking degraded coatings, removing degraded coatings to sound coatings, correctly preparing the surfaces, applying new coatings, and verifying the quality of the coatings.

Response to item (1):

Con Edison has implemented controls for the procurement, application, and maintenance of Service Level 1 protective coatings used inside containment in a manner that is consistent with the licensing basis and regulatory requirements applicable to Indian Point Unit No. 2 (IP-2). The requirements of 10 CFR Part 50 Appendix B, which Con Edison is committed to, are described in IP-2's Quality Assurance Program Description (QAPD) Revision 14. The QAPD specifies compliance with Regulatory Guide 1.54 (June 1973), "Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants." The requirements of the QAPD are implemented through engineering/procurement specifications and various plant procedures.

The licensing basis for the initial construction containment protective coatings used at IP-2 are identified in UFSAR Section 5.1.2.3. The original construction specifications for IP-2 predate the current NRC and ANSI standards for nuclear coatings. The protective coatings specified were as follows:

> "One 3 mil shop coat of Carbozinc No. 11 primer and one 4 mil minimum finish coat of Phenoline No. 305 as manufactured by the Carboline Company have been applied to the liner, as well as essentially all painted surfaces in containment, in accordance with the manufacturer's recommendations."
>
> "Quality of both materials and construction of the containment vessel was ensured by a continuous program of quality control and inspection by Con Edison, and/or its field representatives, and Westinghouse Atomic Power Division, and United Engineers and Constructors Inc."

UFSAR Appendix 6C.6 discusses the compatibility of protective coatings with the post-accident environment in containment. The results of protective coatings evaluation presented in WCAP-7198-L (April 1968), "Evaluation of Protective Coatings For Use in Reactor Containment," found

that, "The protective coatings, which were found to be resistant to the test conditions, that is, exhibited no significant loss of adhesion to the substrate nor formation of deterioration products, comprise virtually all of the protective coatings recommended for use in the containment."

Recent protective coating deficiencies as reported in LER 95-005, have prompted Con Edison to review the adequacy of its program for Service Level 1 protective coatings. As a result of the investigations following the discovery of peeling paint on the 46 foot elevation floor inside containment on February 4, 1995, several improvements to the existing requirements were instituted. In general, requirements for the procurement, application, inspection, and maintenance of Service Level 1 protective coatings are implemented by plant specific documentation approved under the IP-2 QAPD. The procurement of Service Level 1 protective coatings in both new applications and repair/replacement activities is obtained from approved vendors qualified as "Class A" in the QAPD. For the procurement of items associated with Service Level 1 protective coatings, the Nuclear Power Engineering Civil Projects and Programs Section identifies the technical and regulatory requirements to be referenced in procurement documents. Measures have been established which assure that purchased items and services conform to procurement documents. Acceptance activities (i.e., receipt inspection, source surveillance, etc.) are conducted in accordance with procedures which are consistent with the requirements of American National Standards Institute (ANSI) N45.2, "Quality Assurance Program Requirements for Nuclear Power Plants." This procurement process helps to ensure that protective coatings received meet Service Level 1 requirements.

Specific requirements for the procurement and qualification of Service Level 1 protective coatings are delineated in Nuclear Power Engineering Civil Projects and Programs Specifications FCX-95-C-002, "Cleaning, Coating, and Repair of Containment Concrete Floors at Elevation 46 ft.," and FCX-98-C-001, "Painting of Various Areas in IP-2 Containment." These specifications also require that the procurement and qualification of Service Level 1 protective coatings shall comply with, but not be limited to, the following ANSI standards:

- N101.2, "Protective Coating for Light Water Nuclear Reactor Containment Facilities"
- N512, "Protective Coating for the Nuclear Industry"
- N45.2.2, "Packaging, Shipping, Receiving, Storage and Handling of Items for Nuclear Power Plants"
- N45.2.6, "Qualification of Inspection, Examination and Testing Personnel for Nuclear Power Plants"

Qualification testing requirements for Service Level 1 protective coatings are identified in the above mentioned industry standards. The effects of the post-accident environment on the originally applied containment structural protective coatings were evaluated in WCAP-7198-L (April 1968), "Evaluation of Protective Coatings For Use in Reactor Containment." Specifications FCX-95-C-002 and FCX-98-C-001 identify the currently approved protective coatings to be used, including surface preparation, application requirements, and inspection requirements.

A comprehensive, two-phase assessment of the condition of the protective coatings in containment was conducted during the most recent maintenance outage. The first phase of the assessment consisted of a containment walkdown and a review of available coating system documentation. This phase was completed on January 8, 1998. The initial walkdown was performed to assess the condition of the existing coatings. The documentation review was performed to gather information needed to assist in the assessment of the qualification status of the existing coating. The first phase of the assessment resulted in the conclusion that the protective coatings were in generally acceptable condition, although deficiencies were identified in specific areas of the containment liner, polar crane, concrete walls, component cooling water piping, concrete floors, and galvanized electrical conduit. Many of these deficiencies were repaired or addressed prior to the second phase of this assessment. Based upon the visual observations and the documentation review, it was concluded that a limited amount of unqualified coatings were present in the containment. The primary source of the unqualified coatings was on equipment such as valves, valve actuators, and switchgear. The second phase of the assessment identified and documented the baseline condition of the containment coatings and estimated the location and amount of damaged coatings. This phase was completed on June 11, 1998. During this phase the reworked coating areas, which were identified as deficient during the first phase, were re-examined. This assessment was part of the IP-2 restart criteria.

Con Edison is further evaluating the guidance provided in EPRI TR-109937, "Guideline on Nuclear Safety-Related Coating." Upon completion of this evaluation, improvements to our overall protective coating program will be instituted if necessary. We estimate completion of this evaluation by November 1, 1999.

The surface preparation, application and surveillance during installation of Service Level 1 coatings used for new applications or repair/replacement activities inside containment meet the applicable portions of the standards and specifications referenced above. Documentation of completion of these activities is performed consistent with the applicable requirements. Future surveillances of the Service Level 1 protective coatings will be conducted through the program established by Con Edison in response to 10CFR50.65, "Maintenance Rule." Under this program Service Level 1 coating inspections will conducted at 5 year intervals or sooner, if required. These surveillance and repair/replacement activities ensure that the emergency core cooling system and the safety-related containment spray system remain capable of performing their intended safety function.

Required Information

(2) Information demonstrating compliance with item (i) or Item (ii):

(i) For plants with licensing-basis requirements for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related SSCs during a postulated DB LOCA, the following information shall be provided to demonstrate compliance:

(a) The date and findings of the last assessment of coatings, and the planned date

of the next assessment of coatings.

(b) The limit for the amount of unqualified protective coatings allowed in the containment and how this limit is determined. Discuss any conservatism in the method used to determine this limit.

(c) If a commercial-grade dedication program is being used at your facility for dedicating commercial-grade coatings for Service Level 1 applications inside the containment, discuss how the program adequately qualifies such a coating for Service Level 1 service. Identify which standards or other guidance are currently being used to dedicate containment coatings at your facility; or,

(ii) For plants without the above licensing-basis requirements, information shall be provided to demonstrate compliance with the requirements of 10 CFR 50.46b(5), "Long-term cooling" and the functional capability of the safety-related CSS as set forth in your licensing basis. If a licensee can demonstrate this compliance without quantifying the amount of unqualified coatings, this is acceptable. The following information shall be provided:

(a) If commercial-grade coatings are being used at your facility for Service Level 1 applications, and such coatings are not dedicated or controlled under your Appendix B Quality Assurance Program, provide the regulatory and safety basis for not controlling these coatings in accordance with such a program. Additionally, explain why the facility's licensing basis does not require such a program.

Response to item (2) (ii)

The following description and referenced materials describe the licensing basis for IP-2 relative to the conformance with 10 CFR 50.46(b)(5), "Long-term cooling," specifically with regard to IP-2's ability to provide extended decay heat removal including related assumptions for debris that could block containment emergency sump screens:

As discussed in UFSAR Section 6.2.1.1, the licensing basis for the IP-2 emergency core cooling system capability is in accordance with 10 CFR 50 Appendix A, General Design Criteria 44 (now Criterion 35). The basic design criteria for loss-of-coolant accident evaluations prior to the codification under 10 CFR 50.46 was based upon maintaining a fuel cladding temperature less than 1) the melting temperature of Zircaloy-4 , and 2) the temperature at which gross core geometry distortion, including clad fragmentation, may be expected. Additionally, the total core metal-water reaction would be limited to less than 1 percent. These criteria ensure that the core geometry remains in place and substantially intact to such an extent that effective cooling of the core is not impaired. Subsequently, the basic design criteria for loss-of-coolant accident calculations were revised to those required under 10 CFR 50.46.

IP-2 is not committed to Regulatory Guide 1.82, Revision 0, "Sumps for Emergency Core Cooling and Containment Spray Systems." However, in response to a NRC Confirmatory Order of February 11, 1980, an analysis of flow adequacy to the recirculation pumps during all

modes of post design basis accident operation, was performed. This information was submitted to the NRC in Con Edison letter dated June 10, 1980.

At IP-2, the emergency core cooling function is performed by the safety injection system. The system components operate to enable the recirculation of spilled reactor coolant, injected water, and containment spray system drainage back to the reactor from the recirculation sump via the recirculation pumps. The residual heat removal pumps provide backup recirculation capability through the independent containment sump. There are two sumps within the containment, the recirculation sump and the containment sump. Both sumps collect liquids discharged into the containment during the injection phase of the design basis accident. These sumps are physically separated such that blockage of both sumps during a design basis accident is improbable.

The recirculation sump is located at the west side of the containment on elevation 46 ft. inside the crane wall. The recirculation sump is divided into three bays. The sump entrance (first bay) is covered by 1 inch by 4 inch coarse grating to block large debris. An opening is provided between the first and the second bay which is located at the bottom of the first bay. Within the second bay a 1/8 inch (No. 6) stainless steel wire mesh screen is provided to block smaller debris from entering into the third bay. The recirculation pumps are located in third bay. An opening of 2 foot-6 inch by 10 foot at the top of the sump is provided between the middle and the third bays. Water from the containment floor flows through the coarse grating into the recirculation sump. The water flows downward, through the opening between the first and the middle bay, and then turns upward in the middle bay toward the sump the screen, and enters the third bay via the opening between the middle and the third bay. The flow is again turned downward to the suction bells of the recirculation pumps. This design minimizes blockage of the 1/8 inch screen as the floating debris that made it into the sump must have sufficient downward velocity in order to get to the bottom opening between the first and second bays. Debris heavier than water is expected to sink to the bottom. The fluid velocities are very low (from 0.42 ft/sec at the sump entrance to about 0.28 ft/sec in the sump) for a sump flow of 6000 gpm. Failure of the protective coatings may occur in the form of large sheets or as smaller chips. The larger sheets will be blocked by the coarse grating. Smaller debris is expected to sink to either the containment floor or to the bottom of the sumps since the density of this debris is expected to be heavier than the density of water. Coating debris which reaches the 1/8 inch sump screen is expected to be neutrally buoyant relative to the density of water.

The containment sump is located inside the crane wall, in the south, south-east portion of the containment, and is separated from the recirculation sump. The top of the sump is flush with the floor and is protected by floor grating which serves as a coarse screen. Water may enter the containment sump area through several flow paths within the crane wall. There is a labyrinth passageway into the sump area through the south end of the crane wall. The containment sump is also fed by a trench that runs around the eastern exterior side of the crane wall. This trench is covered with floor grating which also serves as a coarse screen. This grating is set flush with the floor in the annular space between the crane wall and the containment liner. The location of this trench maximizes the physical separation to the recirculation sump. The trench is sloped to ensure drainage into the containment sump. Water entering the containment sump must pass through the coarse and fine screens before reaching the suction piping to the residual heat removal pumps. The fine screens located inside the containment sump are designed to remove particles larger than 1/8 inch. The design of the recirculation and containment sumps minimize

the effects of small amounts of unqualified protective coatings on sump performance thus ensuring the effective removal of heat from the core and containment during a large break LOCA. The ability of the safety injection system to meet its capability objectives is presented in UFSAR Section 6.2.3.

The licensing basis for IP-2, as accepted by the NRC's SER, provides both the regulatory and safety basis for safety system performance. Coatings are not treated separately in the licensing basis for IP-2 because the sump screen blockage assumption does not distinguish the source of the LOCA generated debris. As the NRC noted in NRC Generic Letter 85-22, "Potential for Loss of Post-LOCA Recirculation Capability due to Insulation Debris Blockage," a change in regulatory guidance for the basis for sump screen blockage would constitute a generic backfit.

Con Edison does not have a licensing-basis requirement to track the amount of unqualified coatings inside containment. No commitments with respect to monitoring the amount of unqualified coatings inside containment are identified in the UFSAR. To demonstrate compliance with the requirements of 10 CFR 50.46b(5), "Long-term cooling" and the functional capability of the safety-related CSS as set forth in the IP-2 UFSAR, Con Edison performed an assessment of the condition of the protective coatings in containment. This comprehensive assessment was completed on June 11, 1998 and is described in our response to generic letter Item 1. Based upon the assessment's visual observations and documentation review, it was concluded that a limited amount of unqualified coatings were present in the containment. The primary source of these unqualified coatings were on equipment such as valves, valve actuators, and switchgear. This small quantity of unqualified coating is expected to have a minimal impact on emergency core cooling system sump performance, since conservative sump blockage losses were assumed in the design of the sumps.

Response to item (2) (ii) (a)

Con Edison does not currently employ commercial grade dedication for Service Level 1 coatings used inside containment at IP-2. Only Service Level 1 protective coatings as delineated in Nuclear Power Engineering Civil Projects and Programs Specifications FCX-95-C-002, "Cleaning, Coating, and Repair of Containment Concrete Floors at Elevation 46 ft.," and FCX-98-C-001, "Painting of Various Areas in IP-2 Containment" are permitted to be used.

Additional corrective actions have been taken at IP-2 that relate to the quantification of the protective coatings and functional capability of the safety-related emergency core cooling systems. As a result of the significant protective coating repairs performed during the recent outage, Con Edison has established a database to track future coating work and repair areas. This database will track the system or component identification, location of system or component, characteristic testing of existing coating materials, design basis information, type of substrate, proposed surface preparation, proposed repair procedure, and estimated amount of repaired coatings inside containment.

ATTACHMENT B

LIST OF COMMITMENTS

The following list identifies those actions committed to by Con Edison in this document. Any other actions discussed in the submittal represent intended or planned actions by Con Edison. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager, Nuclear Safety & Licensing of any questions regarding this document or any associated regulatory commitments.

Commitment	Due Date
Con Edison is further evaluating the guidance provided in EPRI TR-109937, "Guideline on Nuclear Safety-Related Coating." Upon completion of this evaluation, improvements to our overall protective coating program will be instituted if necessary.	We estimate completion of this evaluation by November 1, 1999.

A. Alan Blind
Vice President

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October 29, 1998

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

Mr. Hubert J. Miller
Regional Administrator -Region I
US Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

SUBJECT: Required Notification in Accordance with 10 CFR 50.9

The purpose of this letter is to document notification made by our Nuclear Safety and Licensing Manager to the Senior Resident Inspector - Indian Point Unit No. 2 on October 28, 1998 of our determination that the basis for the reporting of certain information provided to the Commission may not be accurate in all material respects. Specifically, on May 1, 1996, April 30, 1997 and May 1, 1998 the Annual Effluent and Waste Disposal Reports for Indian Point Units No. 1 and 2, stated in section A.4.d, Liquid Effluents that "Samples of continuous discharges have been taken and analyzed in compliance with Table 4.10-1 of the Technical Specifications."

As a result of an extent of condition review following an internal audit, it was determined that certain analysis requirements for Unit No. 1 were in fact not fully met. For the Unit No. 1 Sphere Foundation Sump Drain the monthly gross alpha analysis was not performed in 1995, 1996 and 1997. Instead a quarterly composite of monthly samples was analyzed for gross alpha. For the Unit No. 1 North Curtain Drain, the monthly gross alpha analysis was not performed for October, November and December 1996, and all of 1997 (except November.) Instead a quarterly composite of monthly samples was analyzed for gross alpha in the fourth quarter of 1996, and the second and third quarters of 1997. In addition, the quarterly Sr-89, Sr-90 and Fe-55 analysis was not performed for the first and fourth quarter 1997.

It should be noted that alpha activity, Sr-89, and Fe-55 has not been detected in these two pathways, and the Sr-90 activity has been constant near the Technical Specification defined Lower Limit of Detection. As a result, it is not expected that the dose calculations reported in the Annual Effluent and Waste Disposal Reports would have changed.

Additional information regarding the extent of condition and 1998 findings, including corrective actions will be provided in a 10 CFR 50.73 report due November 9, 1998.

Should you have any questions regarding this matter, please contact Mr. John McCann, Manager of Regulatory Affairs.

Very truly yours

A. Alan Blind

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