Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003

April 3, 1973

Re Docket No. 50-286

Mr. James P. O'Reilly, Director
Directorate of Regulatory Operations, Region 1
U.S. Atomic Energy Commission
970 Broad Street
Newark, New Jersey 07102

Dear Mr. O'Reilly

Consolidated Edison letter of February 7, 1973 (William J. Cahill, Jr. to James P. O'Reilly) responded to Atomic Energy Commission questions that arose as a result of your inspection of our Indian Point Unit #3. We wish now to submit supplementary information to this previous response.

Cable Tension (Ref: Answer 2j - Enclosure 1)

In order to provide further assurance, calculations will be made of maximum tensions expected during pulling for a number of representative "worst cases". This program includes consultation with cable vendors to ensure the selection of proper parameters for the analyses. These analyses will provide assurance that cable integrity is not violated by excessive tension during pulling.

Con Edison will also implement a program of laboratory testing on representative samples of cables as they are installed in the field. For selected cables, (i.e. those calculated to develop higher tensile stresses) samples will be taken from the pulled end where pulling stresses reach their maximum. Laboratory tests will include examinations and tests of the conductor, insulation and jacket. Conductor geometry, mechanical properties and electrical characteristics will be examined. Insulation will be subject to high potential and resistance tests as well as visual examination. Jacket mechanical properties will also be examined. Test results will be evaluated to assure that the characteristics of the cable, after field installation, are suitable for their intended purposes.

Cable Tray Loading (Ref: Answer 2k - Enclosure 1)

Design cable tray loadings have been reviewed by the design agency to assure that criteria to avoid excessive tray loading have been met. Criteria for cable loading of trays both from a heat dissipation standpoint and also from a physical loading standpoint are contained in FSAR Supplement 11 (Page 8.2-7). Prior to cable installation, a computer is programmed to indicate percentage of tray conduit fill. This information is then reviewed by the design engineer prior to release to the field.

Cable installation procedures assure that cables are routed in accordance with the approved design. During installation, inspection verifies that cables have been routed in accordance with the design. 100% of safeguard cables and 10% of non-safeguard cables are being inspected during installation by Wedco Quality Control. The quality control inspection of the field installation will make overfill of the cable trays apparent and subject to Engineering review. Tray fill acceptance criteria are included in procedures independent of the Cable and Conduit Schedule. The criteria are keyed to code designations stenciled on the trays. Con Edison inspectors also independently inspect a sample of these cables during installation.

Separation of Circuits (Ref: Answer 21 - Enclosure 1)

Wires and cables related to engineered safeguard systems and reactor protective systems are routed and installed to maintain the integrity of respective redundant channels and protect them from physical damage.

Separation of redundant safety-related circuits and nonbridging of these circuits by either safety or non-safety related cable is a feature inherent in the design. Redundancy and separation requirements are initiated by the cognizant electrical or mechanical design engineer. The work of the designer, who prepares the applicable work schedule sheet (which designates the cable routing determination), is spot checked by the cognizant electrical engineer. The routing is designed so that once a cable starts in a channel it remains in that channel for its entire route from origin to destination.

Separation of Circuits (Ref: Answer 21 - Enclosure 1) (cont'd)

Wedco installs the cable as directed by the Conduit and Cable Schedule. Cables and wire ways are marked by means of metal tags attached to each end. These tags are embossed to conform with the identification given in the Conduit and Cable Schedule. Each multiple conductor termination is pre-marked to indicate the terminal designation of each conductor. The installation is followed by the Wedco field engineer. In addition, 100% of the safeguard cables and 10% of non-safeguard cables are being inspected by Wedco Quality Control during pulling operations and documented to assure that proper routing is achieved. Con Edison also independently inspects a sample of these cables during pulling.

Splice Insulation (Ref: Answer 1 - Enclosure 2)

The penetration area splices are made in accordance with UE&C Procedure 931-05-LL-30103. This procedure has been developed as a result of experience gained in Westinghouse plants, which are in operation, and is used throughout the industry. The splices used at the penetrations are segregated by channel so that cables in one channel cannot be damaged by a fire in any redundant channel. The safeguard functions are thus assured by providing redundant channels, physically separated from one another.

Neither the cable nor any splice can be designed to continue in operation when exposed to a major fire. Fire resistant cable is important because it limits the spread of fire from one area to another. Since splices are located in a limited area, they do not contribute to the spread of fire throughout the tray system. The same fire resistant characteristics that are used for lengthy cable runs are not normally required for localized splices. In the case of the fire repair at IP-2, because the splice locations were not included in the original design, additional criteria were established for fire repairs only. These criteria required that repaired cable, including splices, would have

Splice Insulation (Ref: Answer 1 - Enclosure 2) (cont'd)

fire resistant characteristics equal or better than the original unspliced cable. Therefore, additional protection was provided at the repaired location in the form of fiberglass covering over splices. This is not necessary when proper segregation and separation are designed into the splice area.

Very truly yours

William J. Cahill, Jr.

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