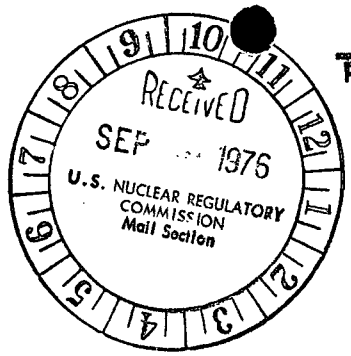
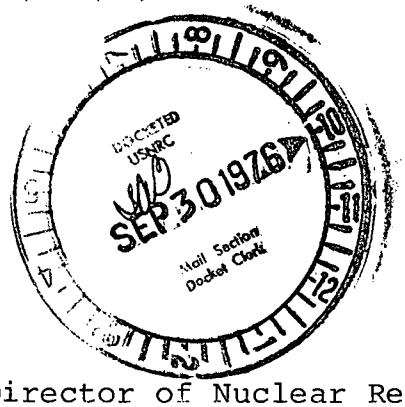
William J. Cahill, Jr.
Vice President



Regulatory File Cy

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003
Telephone (212) 460-3819



September 24, 1976

RE: Indian Point Unit No. 3
Docket No. 50-286

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Reid:

As indicated in my September 20, 1976 letter, forwarded herewith is our partial response to your August 12, 1976 information request relating to the effects degraded grid voltage may have on plant operation (Attachment). It is expected that the remainder of the information can be forwarded to you by the end of this year.

Very truly yours,

William J. Cahill, Jr.
Vice President

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Copy to: Mr. George T. Berry
General Manager and Chief Engineer
Power Authority of the State of New York
10 Columbus Circle
New York, New York 10019

9906

Indian Point Unit No. 3

1.a Describe the plant conditions under which the plant auxiliary systems (safety related and non-safety related) will be supplied by offsite power. Include an estimate of the fraction of normal plant operating time in which this is the case?

During "on line" unit operation 6900 volt buses 1 through 4 are normally fed from the unit via the 22KV main generator isolated phase buses and the Unit Auxiliary Transformer. Bulk power from the 138KV offsite system is normally supplied to the plant via connections to 6900 volt buses 5 and 6 through the Station Auxiliary Transformer.

Two 50% trains of safety related equipment are in turn powered from the offsite source (480 volt switchger 5A and 480 volt motor control center 36A via 6900 volt bus 5 and 480 volt switchgear 6A and 480 volt motor control center 36B via 6900 volt bus 6), while a third 50% train is powered from the unit (480 volt switchgears 2A and 3A and 480 volt motor control center 36C).

It is estimated that these conditions prevail in excess of 98% of normal plant operating time. The exceptions to this are 8 hours each month when the diesels are tied to the auxiliary buses as part of their required surveillance testing and a conservatively estimated total of 30 hours each year, based on experience with Unit No. 2 during which the diesels may be automatically initiated and operated.

1.b The voltage used to describe the grid distribution system is usually a "nominal" value. Define the normal operating range of your grid system voltage and the corresponding voltage values at the safety related buses?

The "Nominal" voltages expected at the Buchanan Substation buses are 345 to 355 KV for the 345KV system and 136 to 142KV for the 138KV system. Corresponding voltage values at the safety related buses will be forwarded upon completion of load flow/voltage studies which are currently underway.

1.e Identify the sensor location and provide the trip setpoint for your facility's Loss of Offsite Power (undervoltage trip) instrumentation. Include the basis for your trip setpoint selection.

Sensors and trip setpoints for our facility's loss of Offsite Power instrumentation are as follows:

a) An SV instanteous undervoltage relay is located on each of the four 6900V buses (one per bus) which are normally fed from the Unit Auxiliary Transformer. The trip setpoint for each relay is 5175V (or 75% of rated 6900V). There is a timer associated with each relay which is set to time out at 0.1 sec. Operation of any two of the four relays will initiate a reactor scram.

The basis for the SV trip setpoint at Indian Point #3 is to provide adequate reactor protection in anticipation of a primary system loss of flow while maintaining coordination with phase and ground fault protection on the 6.9 Kv buses in order to prevent unnecessary reactor trips. These set points are within the limits of the IP3 FSAR. ($\geq$70% normal voltage).

b) A CV-7 voltage relay is connected to the six 6900V buses (one per bus). The trip setpoint of each relay is 5580V. (or approx. 81% of 6900V). The minimum operating time for relay plus auxiliary timer is 30.8 sec. Relay operation trips all loads connected to the buses including station service transformers which feed the safety related switchgear. The basis for the trip setpoint of the CV-7 relays located on the 6.9 Kv buses is to provide under-voltage protection for the motors.

c) On each of four 480V safety related buses there is a set of two CV-7 voltage relays (one set per bus). During "on line" operation two of these buses are normally fed from the Unit Auxiliary Transformer and two from the Station Auxiliary Transformer. The trip setpoint is 220V (approx. 46% of 480V) and for a drop of voltage from 480V to zero the relay will operate in 2.0 sec. The relay trips the breakers associated with normal bus supply and support diesel start, bus stripping and load sequencing operations.

The basis for the settings of the CV-7 relays on the 480 volt buses is to provide rapid actuation for diesel start and sequencing in the event of complete loss of power without creating a potential for spurious actuation during limited momentary voltage dips caused by motor starts, bus transfer, or transcient conditions effecting the plant distribution system.

1.h Describe the bus voltage monitoring and abnormal voltage alarms available in the control room.

Separate voltmeters are provided in the control room for the 6900 volt and 480 volt systems. By operating the selector switches associated with each of these voltmeters voltage on any 480 volt or 6900 volt bus can be displayed. Voltmeters for main generator output and system (345 Kv) voltages are provided on the flight panel.

Some of the individual alarms provided in the control room which could be indicative of abnormal voltage include:

1) Panel SEF (Supervisory Annunciator)

   a. Volts/Hertz
   b. Over Excitation
   c. Exciter Trouble
   d. Gen. Voltage Regulator Trip
   e. Exciter Field Overcurrent

2) Panel SGF (Supervisory Annunciator)

   138 Kv Substation Trouble

3) Panel SHF (Supervisory Annunciator)

   a. Unit Aux Trans Tap Changer Hangup
   b. Unit Aux Trans Trouble
   c. Station Aux Trans Trouble
   d. Station Service Trans Trouble (1 for each trans)
   e. Station Aux Trans Tap Changer Hangup
   f. 6900 volt Motor Trip
   g. 480 Volt Swgr Motor Trip

4) Panel FDF (reactor trip first out annunciator)

   Undervoltage Trip

2. The functional safety requirement of the undervoltage trip is to detect the loss of offsite (preferred) power system voltage and initiate the necessary actions required to transfer safety related buses to the onsite power system. Describe the load shedding feature of your design (required prior to transfering to the onsite (diesel generator systems) and the capability of the onsite systems to perform their function if the load shedding feature is maintained after the diesel generators are connected to their respective safety buses. Describe the bases (if any) for retention or reinstatement of the load shedding function after the diesel generators are connected to their respective buses.

Independent relays with significantly different settings are used to accomplish the separate functions of isolating the safety related buses from any offsite voltage abnormalities and providing necessary support (e.g. load shedding) for diesel startup and sequencing. CV-7 relays on each of the 6900 volt buses set at 81% of nominal voltage will after a time delay of approximately 30 seconds trip the feeds to the 6900/480 volt station service transfromers. Completely independent relays on the 480 volt safety related switchgear set at approximately 46% of nominal voltage support diesel start, bus stripping and load sequencing operations. In addition these relays also initiate isolation of the safety related buses by tripping breakers on the low side of the station service transformers.

At a relatively high voltage (81%) safety related buses will be isolated from the offsite source. Independent circuitry and relatively low "live bus" voltage

(46%) is used to support the diesel sequence. This design guarantees the independence of the safety related buses from any problems effecting offsite power, while assuring more than adequate margins to accommodate inrush related voltage dips during the diesel loading sequence.

Because of the relatively low setting of the 480 volt undervoltage relays their load shedding feature does not have to be defeated after the diesel generators are connected to the safety related buses.

William J. Cahill, Jr.
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003
Telephone (212) 460-3819

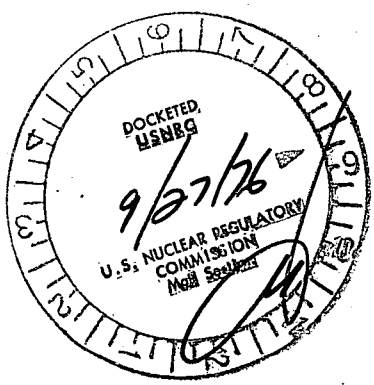
September 24, 1976

Re: Indian Point Unit Nos. 1,2, and 3
Docket Nos. 50-3, 50-247 & 50-286

Mr. Ben C. Rusche
Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

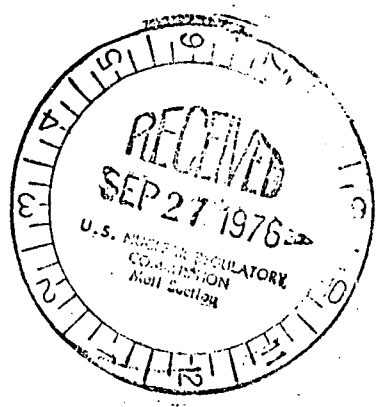
Dear Mr. Rusche:

Con Edison requests that copies of NRC correspondence concerning Indian Point Unit Nos. 1,2 and 3, previously sent to Arvin E. Upton, Esquire, be sent to Leonard M. Trosten, Esquire. The address LeBoeuf, Lamb, Leiby & MacRae, 1757 N Street N.W., Washington, D.C. 20036 remains the same.



Very truly yours,

William J. Cahill, Jr.
Vice President



WJC/nvg

Copy to: Mr. James P. O'Reilly, Director
Office of Inspection and Enforcement
Region 1
U.S. Nuclear Regulatory Commission
King of Prussia, Pa. 19406

Mr. George T. Berry
General Manager and Chief Engineer
The Power Authority of the
State of New York
10 Columbus Circle
New York, N.Y. 10019

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