

William J. Cahill,
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N Y 10003
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December 19, 1979

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

Director of Nuclear Reactor Regulation
ATTN: Mr. A. Schwencer, Chief
Operating Reactors Branch No. 1
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Schwencer:

We hereby transmit, as Attachment A to this letter, our response to your letter dated October 23, 1979. This information is being submitted pursuant to 10 CFR 50.54(f) as requested and forty (40) copies of this submittal are being provided.

Should you or your staff have any questions, please contact us.

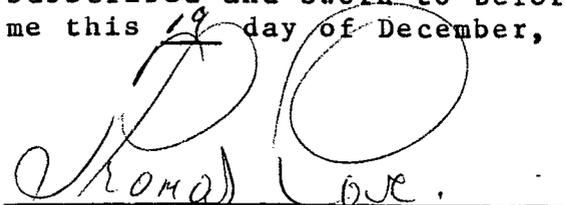
Very truly yours,



William J. Cahill, Jr.
Vice President

attach.

Subscribed and sworn to before
me this 19 day of December, 1979.



Notary Public

THOMAS LOVE
Notary Public State of New York
No. 31-2409638
Qualified in New York County
Commission Expires March 30, 1981

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ATTACHMENT A

Response to NRC October 23, 1979
letter (Schwencer to Cahill)

Consolidated Edison Company of New York, Inc.
Indian Point Unit No. 2
Docket No. 50-247
December, 1979

As addressed in our November 15, 1979 response to the NRC's September 27, 1979 letter, we have initiated the requested valve qualification program for Indian Point Unit No. 2 containment purge and pressure relief valves on an expedited basis. Specifically, we have initiated an operability verification review for these valves and have been conducting discussions with the valve supplier regarding the design, construction, and testing of these valves. Based on preliminary information received from our valve supplier, we have concluded that the containment purge and pressure relief isolation valves will perform satisfactorily following a DBA-LOCA** and will close against the ascending differential pressure resulting from the DBA-LOCA. The details are provided below in our specific responses to the NRC Regulatory Staff's Interim Positions. We are working with our valve supplier to complete the formal valve re-evaluation. The status of this re-evaluation together with our supplemental response to your November 28, 1978 letter and Branch Technical Position CSB 6-4 will be provided to the NRC by March 3, 1980.

During the interim, the NRC Regulatory Staff's Interim Positions are satisfied as follows:

NRC Interim Position 1:

Whenever the containment integrity is required, emphasis should be placed on operating the containment in a passive mode as much as possible and on limiting all purging and venting times to as low as achievable. To justify venting or purging there must be an established need to improve working conditions to perform a safety related surveillance or safety related maintenance procedure. (Examples of improved working conditions would include deaerating, reducing temperature*, humidity*, and airborne activity sufficiently to permit efficient performance or to significantly reduce occupational radiation exposures).

*Only where temperature and humidity controls are not in the present design.

**DBA-LOCA=Design Basis Accident-Loss of Coolant Accident (i.e., double-ended guillotine rupture of the largest reactor coolant pipe).

Response:

Whenever containment integrity is required, the Indian Point Unit No. 2 containment is operated in a passive mode as much as possible and all purging and venting times are limited to as low as achievable. As discussed in our earlier January 9, 1979 and July 9, 1979 submittals, the containment purge system is used for containment atmosphere cleanup, cooldown and ventilation immediately prior to and during shutdown modes when personnel access to containment is required. In addition, the purge system may be utilized to facilitate personnel access at those infrequent instances when containment entry during power operation may be necessary. Past operating experience has shown that only approximately 2% of the annual purge system operating time occurs during power operation. As stated in our earlier July 9, 1979 submittal, we have committed to limit containment purging during power operation to no more than ninety (90) hours per calendar year until such time that the NRC Staff has completed their review of the information to be provided.

As also discussed in our previous submittals, the independent 10-inch Containment Pressure Relief Line, not the Containment Purge System, is utilized to relieve normal containment atmosphere pressure buildup during power operation. The Containment Pressure Relief System satisfies the need to periodically relieve containment atmosphere pressure to compensate for air in-leakage to containment from various instrument air system and weld channel and containment penetration pressurization system sources. This containment pressure relief is necessary to preclude eventual actuation of the high containment pressure safety injection signal at 1.6 psig and subsequent unnecessary and unwarranted tripping and cycling of the unit and actuation of safety injection engineered safeguards systems. Past operating experience

has shown that essentially 100% of pressure relief line use occurs during power operation and that containment pressure relieving an equivalent of approximately 2 to 3 hours per day at design flow rate (i.e., 1500 cfm) is required to limit containment atmospheric pressure. As stated in our earlier July 9, 1979 submittal, we have committed to containment pressure relieving only for the minimum time necessary to limit containment atmospheric pressure.

NRC Interim Position 2:

Maintain the containment purge and vent isolation valves closed whenever the reactor is not in the cold shutdown or refueling mode until such time as you can show that:

- a. All isolation valves greater than 3" nominal diameter used for containment purge and venting operations are operable under the most severe design basis accident flow condition loading and can close within the time limit stated in your Technical Specifications, design criteria or operating procedures. The operability of butterfly valves may, on an interim basis, be demonstrated by limiting the valve to be no more than 30° to 50° open (90° being full open). The maximum opening shall be determined in consultation with the valve supplier. The valve opening must be such that the critical valve parts will not be damaged by DBA-LOCA loads and that the valve will tend to close when the fluid dynamic forces are introduced, and
- b. Modifications, as necessary, have been made to segregate the containment ventilation isolation signals to ensure that, as a minimum, at least one of the automatic safety injection actuation signals is uninhibited and operable to initiate valve closure when any other isolation signal may be blocked, reset, or overridden.

Response to 2.a:

The design of Indian Point Unit No. 2 is such that the containment purge and pressure relief isolation valves are required to close following a DBA-LOCA and are not required to be subsequently opened for the functioning of any safeguards systems. Therefore, once closed, there is no need to reopen these valves. Accordingly, such environmentally related failures of solenoid pilot valves as addressed in IE Bulletin No. 79-01A and referenced in your October 23, 1979 letter to us, are not applicable (see Con Edison's responses to IE Bulletin 79-01A dated August 1, 1979 and August 30, 1979).

With respect to closure of these isolation valves against the increasing differential pressure caused by the postulated DBA-LOCA, the vendor has provided us with data that represent the results of a preliminary, conservative assessment of valve operation. This data is tabulated below:

Containment Purge 36" Valves
(FCV-1170, 1171, 1172 & 1173)

Containment Pressure Relief 10" Valves
(PCV-1190, 1191 & 1192)

<u>Degrees</u> <u>Valve</u> <u>Open</u>	<u>Maximum</u> <u>Delta P</u>	<u>Degrees</u> <u>Valve</u> <u>Open</u>	<u>Maximum</u> <u>Delta P</u>
---	---	0	170
10	110	10	170
20	110	20	170
30	110	30	170
40	110	40	125
50	101	50	100
60	50	60	55
70	25	70	40
80	16	80	20
90	16	90	20

Conservatively speaking, therefore, the valves must have initiated closure prior to the containment pressure reaching 16 psig. We have evaluated the present actuation circuitry and components and have determined the following "total" time for operation (i.e. closure) of the above mentioned valves for the DBA-LOCA:

<u>Time Increment</u>	<u>Time (Seconds)</u>	<u>Source</u>
Time to SI Signal:	0.97	Ref. 1
Time to CI Signal:	0.32	Ref. 2
Individual Valve Circuitry:	0.04	Ref. 2
Solenoid De-energization:	0.05	Ref. 2
Actual Valve Closure Time:	2.00*	Ref. 3
<u>"Total" Time:</u>	<u>3.38</u>	

It can be seen from the above information that the actual time from initiation of the pipe failure to initiation of valve closure is 1.38 seconds. From the Indian Point 2 FSAR Figure 14.3.4-2 for the post-LOCA containment pressure transient evaluation (assuming minimum safeguards equipment operation), it is noted that for the

*Maximum Closure Time permitted by the FSAR and verified periodically by valve exercising tests.

worst-case "double ended break", the maximum containment pressure reached at 1.38 seconds is approximately 13 psig. In addition, we have evaluated the incremental operating times for these valves from the 90° (i.e., full open) to the 60° position and through to the 0° (i.e., full closed) position. From this evaluation, we have determined that the conservatively calculated maximum DBA-LOCA containment pressure will be less than the maximum delta-P against which the valves can close for any position of the valves through to full closure.

Therefore, it can be concluded that within the timing constraints imposed on the containment purge and pressure relief isolation valves, critical valve parts will not be damaged by DBA-LOCA loads and that valve closure will be initiated and completed against the fluid dynamic forces created by the DBA-LOCA and containment integrity will be maintained once the valves are closed.

Response to 2.b:

As discussed in our previous January 9, 1979 and July 9, 1979 submittals, a review was conducted of the instrumentation and control circuitry for the containment purge system and the containment pressure relief system isolation valves. These valves receive an automatic closure signal upon generation of either a containment isolation signal (derived from any safety injection signal) or a containment high radiation signal. Manual bypass of either signal does not affect the availability or operation of the other signal. We have concluded that the events at Millstone Unit 2 and Salem Unit 1, described in your November 28, 1978 letter, cannot occur at Indian Point Unit No. 2 with the present electrical design.

As also requested by your November 28, 1978 letter and as addressed in our previous submittals, we have been conducting a re-review of all safety actuation signal circuits which incorporate manual override features. This study is nearing completion and our preliminary findings indicate that no non-conforming circuits exist at Indian Point 2 and that operation of a bypass will affect no safety functions other than those analyzed and discussed on our dockets. The final results of our

electrical re-review will be provided with the containment purging information by March 3, 1980.

Should there be any questions regarding our methods, plans or schedule for addressing the above issues, please contact us.

References

- (1) Indian Point 2 ECCS Analysis - December 1978.
- (2) Component and circuitry maximum operating times obtained from design electrical drawings and manufacturers' catalogues.
- (3) Indian Point 2 FSAR, Section 5.2.