

Stephen B. Bram  
Vice President

Consolidated Edison Company of New York, Inc.  
Indian Point Station  
Broadway & Bleakley Avenue  
Buchanan, NY 10511  
Telephone (914) 737-8116

May 3, 1990

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

Mr. Donald S. Brinkman, Senior Project Manager  
Project Directorate I-1  
Division of Reactor Projects I/II  
US Nuclear Regulatory Commission  
Mail Stop 14B-2  
Washington, DC 20555

SUBJECT: Application for License Amendment to Increase Authorized Power Level (TAC No. 69542)

This letter is in response to the telephone call on April 18, 1990, regarding the request you received from the Advisory Committee on Reactor Safeguards (ACRS) to provide additional information on Moderator Temperature Coefficient (MTC) and Anticipated Transient Without Scram (ATWS) for Indian Point Unit No. 2 at a stretch rating core power level of 3071.4 MWt. License Amendment Number 148 approving operation of IP-2 at a core power level of 3071.4 MWt was issued by the NRC on March 7, 1990. The additional information requested concerns the MTC values we provided you by a letter dated February 22, 1990 in response to questions raised by the ACRS on February 9, 1990 during a meeting where Con Edison's application for stretch power was discussed. The following responses have been supplied to us by Westinghouse Corporation (Westinghouse Letter IPP-90-560, Dated April 24, 1990), the NSSS vendor for Indian Point Unit No. 2, which also generated the MTC Values that were set forth in our April 22, 1990 letter.

Question:

In the February 22, 1990 letter a statement is made indicating that the MTC values are not "limiting" but typical. In case of an ATWS, however, what is needed is the limiting value at the beginning of cycle. Can we get these limiting values?

Response:

The previously provided MTC values were estimated to be typical for a core design based on a full cycle of operation at stretch power rating conditions. Since cycle 10 startup was not at the stretch rating conditions, MTC values had not been determined based on a full cycle of stretch rating conditions. Therefore, typical values for a full cycle of stretch operation were provided to allow a reasonable comparison with corresponding MTC values that had been calculated at the beginning of cycle 10 based on the pre-stretch conditions. In response to your request that

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Con Edison identify a limiting value of the beginning-of-life (BOL) (i.e., cycle burnup of 0.0 MWD/MTU) MTC based on a core design for a full operating cycle at the stretch rating conditions, please note that Indian Point Unit 2 technical specifications require that the MTC must always be zero or negative except during low power physics tests (Technical Specification No. 3.1.C.1, see Attachment A). The core is designed to the zero limit, therefore zero is the limiting least negative MTC value for which operation is permitted. The plant will always be operating at values that are below this limiting value.

For the purpose of assessing an ATWS event, it should be pointed out that MTC is only one of many characteristics that can affect the consequences of an ATWS. The core response is determined by the total reactivity feedback (including Doppler as well as moderator). The total plant response is a function of the plant configuration. Thus, the feedback characteristics are not the only consideration made when assessing an ATWS event.

ATWS is currently evaluated on a risk (probabilistic) basis, which Indian Point Unit 2 satisfies. This basis was referred to by the NRC staff during the 358th General Meeting of the ACRS on February 9, 1990, where the stretch rating license amendment request for Indian Point Unit 2 was discussed (Transcript Pages 299-301). There was previously a complete discussion of this basis presented to the ACRS I&C Subcommittee on April 21, 1989, at which time it was concluded that plants were satisfying the requirements of the ATWS Rule and its bases.

Should you or your staff have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety and Licensing.

Very truly yours,

A handwritten signature in black ink, appearing to read "A. W. Jackson". The signature is written in a cursive style with a large initial "A" and a long, sweeping underline.

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

Mr. Thomas T. Martin  
Regional Administrator - Region I  
US Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Senior Resident Inspector  
US Nuclear Regulatory Commission  
PO Box 38  
Buchanan, NY 10511

Mayor, Village of Buchanan  
236 Tate Avenue  
Buchanan, NY 10511

Ms. Donna Ross  
Division of Policy Analysis and Planning  
New York State Energy Office  
Agency Building 2, Empire State Building  
Albany, NY 12223

Mr. K. F. Matthews  
Project Engineer, New York Area  
Westinghouse Electric Corporation  
Energy Center Site  
4350 Northern Pike  
Monroeville, PA 15146-2886

ATTACHMENT A

APPENDIX A TO FACILITY  
OPERATING LICENSE DPR-26  
TECHNICAL SPECIFICATIONS  
AND BASES SECTION 3.1.C.1

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.  
INDIAN POINT UNIT NO. 2  
DOCKET NO. 50-247  
MAY, 1990

### C. MINIMUM CONDITIONS FOR CRITICALITY

1. Except during low power physics tests, the reactor shall not be made critical at any temperature above which the moderator temperature coefficient is positive.
2. In no case shall the reactor be made critical below the temperature and pressure limits shown in Figure 3.1.B-1.
3. When the reactor coolant temperature is below the minimum temperature specified in 1. above, the reactor shall be subcritical by an amount greater than the potential reactivity insertion due to depressurization.
4. The reactor shall be maintained subcritical by at least 1% until normal water level is established in the pressurizer.

#### Basis

During the early part of the initial fuel cycle, the moderator temperature coefficient is calculated to be slightly positive at coolant temperatures below the power operating range.<sup>(1)(2)</sup> The moderator coefficient at low temperatures will be most positive at the beginning of life of the fuel cycle, when the boron concentration in the coolant is the greatest. Later in the life of the fuel cycle, the boron concentrations in the coolant will be lower and the moderator coefficients will be either less positive or will be negative. At all times, the moderator coefficient is negative in the power operating range.<sup>(1)(2)</sup> Suitable physics measurements of moderator coefficients of reactivity will be made as part of the startup program to verify analytic predictions.

The requirement that the reactor is not to be made critical when the moderator coefficient is positive has been imposed to prevent any unexpected power excursion during normal operations as a result of either an increase of moderator temperature or decrease of coolant pressure. This requirement is waived during lower power physics tests to permit measurement of reactor moderator coefficient and other physics design parameters of interest. During physics tests, special operating precautions will be taken.

The requirement that the reactor is not to be made critical below the temperature and pressure limits shown in Figure 3.1.B-1 provides increased assurance that the proper relationship between reactor coolant pressure and temperature will be maintained during system heatup and pressurization in accordance with the requirements of 10CFR50 Appendix G, as amended February 2, 1976. Heatup to this temperature will be accomplished by operating the reactor coolant pumps.