

January 26, 1998

Mr. James Knubel
Chief Nuclear Officer
Power Authority of the State
of New York
123 Main Street
White Plains, NY 10601

SUBJECT: ISSUANCE OF AMENDMENT FOR INDIAN POINT NUCLEAR GENERATING UNIT
NO. 3 (TAC NO. M99231)

Dear Mr. Knubel:

The Commission has issued the enclosed Amendment No.177 to Facility Operating License No. DPR-64 for the Indian Point Nuclear Generating Unit No. 3 (IP3). The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated September 8, 1997, as supplemented November 3, 1997.

The amendment changes the TSs by revising the $f(\Delta I)$ function. The $f(\Delta I)$ function is defined in the TS as a function of the indicated difference between the top and bottom detectors of the power range nuclear ion chambers. This function is used in the calculation of the overtemperature ΔT (OTAT) reactor trip.

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original Signed by:

George F. Wunder, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-286

Enclosures: 1. Amendment No.177 to DPR-64
2. Safety Evaluation

cc w/encls: See next page

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DATE	12/2/97	12/2/97	12/2/97	12/1/97	12/1/97		

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

January 26, 1998

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Power Authority of the State
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123 Main Street
White Plains, NY 10601

SUBJECT: ISSUANCE OF AMENDMENT FOR INDIAN POINT NUCLEAR GENERATING UNIT
NO. 3 (TAC NO. M99579)

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The amendment changes the TSs by revising the $f(\Delta I)$ function. The $f(\Delta I)$ function is defined in the TS as a function of the indicated difference between the top and bottom detectors of the power range nuclear ion chambers. This function is used in the calculation of the overtemperature ΔT (OT ΔT) reactor trip.

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Sincerely,

A handwritten signature in dark ink, appearing to read "George F. Wunder", is written over a horizontal line.

George F. Wunder, Project Manager
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-286

Enclosures: 1. Amendment No. 177 to DPR-64
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cc w/encls: See next page

DATE: January 26, 1998

ISSUANCE OF AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-28

Docket File

PUBLIC

PDI-1 R/F

B. Boger

S. Bajwa

S. Little

G. Wunder

T. Collins

OGC

G. Hill (2)

W. Beckner

ACRS

C. Hehl, Region I

T. Harris (e-mail SE only TLH3)

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**James Knubel
Power Authority of the State
of New York**

**Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406**

**Mr. Gerald C. Goldstein
Assistant General Counsel
Power Authority of the State
of New York
1633 Broadway
New York, NY 10019**

**Mr. Eugene W. Zeltmann, President
and Chief Operating Officer
Power Authority of the State
of New York
123 Main Street
White Plains, NY 10601**

**Mr. Robert J. Barrett
Site Executive Officer
Indian Point 3 Nuclear Power Plant
P.O. Box 215
Buchanan, NY 10511**

**Ms. Charlene D. Faison
Director Nuclear Licensing
Power Authority of the State
of New York
123 Main Street
White Plains, NY 10601**

**Mr. F. William Valentino, President
New York State Energy, Research,
and Development Authority
Corporate Plaza West
286 Washington Ave. Extension
Albany, NY 12203-6399**

**Charles Donaldson, Esquire Assistant
Attorney General
New York Department of Law
120 Broadway
New York, NY 10271**

**Indian Point Nuclear Generating
Station Unit No. 3**

**Resident Inspector
Indian Point 3 Nuclear Power Plant
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, NY 10511**

**Mr. Charles W. Jackson, Manager
Nuclear Safety and Licensing
Consolidated Edison Company
of New York, Inc.
Broadway and Bleakley Avenues
Buchanan, NY 10511**

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

**Mr. Richard L. Patch, Director
Quality Assurance
Power Authority of the State
of New York
123 Main Street
White Plains, NY 10601**

**Mr. Paul Eddy
New York State Dept. of
Public Service
3 Empire State Plaza, 10th Floor
Albany, NY 12223**

**Union of Concerned Scientists
Attn: Mr. David Lochbaum
1616 P Street, NW, Suite 310
Washington, DC 20036**



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

POWER AUTHORITY OF THE STATE OF NEW YORK

DOCKET NO. 50-286

INDIAN POINT NUCLEAR GENERATING UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. DPR-64

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Power Authority of the State of New York (the licensee) dated September 8, 1997, as supplemented November 3, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-64 is hereby amended to read as follows:

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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 177, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance to be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



S. Singh Bajwa, Director
Project Directorate I-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 26, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 177

FACILITY OPERATING LICENSE NO. DPR-64

DOCKET NO. 50-286

Revise Appendix A as follows:

Remove Pages
2.3-2

Insert Pages
2.3-2

- ΔT_o $\leq$ Measured full power ΔT for the channel being calibrated, °F
- T_{avg} = Average Temperature for the channel being calibrated, °F (input from instrument racks)
- T' = Measured full power T_{avg} for the channel being calibrated, °F
- P = Pressurizer pressure, psig (input from instrument racks)
- P' = 2235 psig (i.e., nominal pressurizer pressure at rated power)
- K_1 $\leq$ 1.20
- K_2 = 0.0273
- K_3 = 0.0013
- K_1 is a constant which defines the overtemperature ΔT trip margin during steady state operation if the temperature, pressure, and $f(\Delta I)$ terms are zero.
- K_2 is a constant which defines the dependence of the overtemperature ΔT setpoint to T_{avg} .
- K_3 is a constant which defines the dependence of the overtemperature ΔT setpoint to pressurizer pressure.
- ΔI = $q_t - q_b$, where q_t and q_b are the percent power in the top and bottom halves of the core respectively, and $q_t + q_b$ is total core power in percent of rated power.
- $f(\Delta I)$ = a function of the indicated difference between top and bottom detectors of the power-range nuclear ion chambers; with gains to be selected based on measured instrument response during plant startup tests, where q_t and q_b are defined above such that:
- (a) for $q_t - q_b$ between ~~-6.75~~ -15.75 percent and +6.9 percent, $f(\Delta I) = 0$.
 - (b) for each percent that the magnitude of $q_t - q_b$ exceeds +6.9 percent, the ΔT trip setpoint shall be automatically reduced by an equivalent of 3.333 percent of rated power.
 - (c) for each percent that the magnitude of $q_t - q_b$ is more negative than ~~-6.75~~ -15.75 percent, the ΔT trip setpoint shall be automatically reduced by an equivalent of 4.000 percent of rated power.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO.177 TO FACILITY OPERATING LICENSE NO. DPR-64
POWER AUTHORITY OF THE STATE OF NEW YORK
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

1.0 INTRODUCTION

By letter dated September 8, 1997, as supplemented November 3, 1997, the Power Authority of the State of New York (PASNY or the licensee) requested changes to the Indian Point 3 (IP3) Technical Specifications (TSs) to revise the $f(\Delta I)$ function. The $f(\Delta I)$ function is defined in the TS as a function of the indicated difference between the top and bottom detectors of the power range nuclear ion chambers. This function is used in the calculation of the Overtemperature ΔT (OT ΔT) reactor trip. The licensee's November 3, 1997, submittal contained clarifying information that did not change the staff's proposed finding of no significant hazards considerations.

2.0 EVALUATION

The $f(\Delta I)$ function is used in the OT ΔT trip equation given in TS 2.3 for IP3 in the following manner:

$$\Delta T \leq \Delta T_0 [K_1 - K_2 (T_{avg} - T') + K_3 (P - P') - f(\Delta I)]$$

where

ΔT is the measured reactor coolant system (RCS) ΔT

ΔT_0 is the indicated ΔT at rated thermal power (RTP)

T_{avg} is the measured RCS average temperature

T' is the nominal T_{avg} at RTP

P is the indicated pressurizer pressure

P' is the pressurizer pressure at RTP

K_1 , K_2 , K_3 are constants

ΔI is equal to $q_t - q_b$, where q_t and q_b are the percent power in the top and bottom halves of the core, respectively, and $q_t + q_b$ is total core power in percent of RTP.

The OTAT trip is designed to provide departure from nucleate boiling (DNB) protection for relatively slow transients such as the uncontrolled rod withdrawal at power, inadvertent boron dilution, excessive load increase, and depressurization of the reactor coolant system. By the equation, an increase in T_{avg} will cause the setpoint to decrease, a decrease in pressure will cause the setpoint to decrease, and a worsening axial flux distribution will cause a setpoint decrease. Each of these parameter changes causes a decrease in the DNB ratio (DNBR) and, therefore, requires a more conservative trip setpoint. At IP3, this trip function also provides a signal to generate a turbine runback prior to reaching the trip setpoint.

The current $f(\Delta I)$ function is defined such that when the percent power difference between the top and bottom halves of the core is between -6.75% and +6.9%, $f(\Delta I)$ is zero. If the percent power difference between the top and bottom halves of the core differ by more than this allowable span, a penalty on the ΔT trip setpoint is imposed. For each percent that the magnitude of $q_t - q_b$ exceeds +6.9%, the trip setpoint is automatically reduced by an equivalent of 3.333% of RTP. For each percent that the magnitude of $q_t - q_b$ is more negative than -6.75%, the trip setpoint is automatically reduced by an equivalent of 4.0% of RTP. PASNY has proposed to increase the allowable span for a zero $f(\Delta I)$ penalty to -15.75% through +6.9%, based on the reanalysis of the boron dilution event discussed below. The penalties imposed for a percent power difference between the top and bottom of the core which are larger than this span would remain unchanged.

Although the boron dilution event is analyzed for various operational modes, only the Mode 1 analysis relies on the OTAT trip function. The most limiting dilution event occurs with the control rods in automatic. When the transient is initiated, the rod controller attempts to compensate for the power and temperature increase by slow insertion of the control rods. Rod motion is terminated when the rods reach the insertion limits, which results in a rod insertion limit low level alarm to the operator. Since IP3 procedures require the placement of one primary water makeup pump (PW pump) control switch in the pull-out position, the event was reanalyzed assuming a dilution rate corresponding to the maximum flow of only one PW pump (plus pump uncertainties). The lower dilution flow rate decreases the reactivity inserted into the core after the rods have reached the insertion limits, thereby reducing the increase in core power and yielding lower axial peaking. This allows the operator to terminate the transient within 15 minutes after the insertion limit alarm and before the $f(\Delta I)$ trip penalty is required, thereby allowing $f(\Delta I)$ to be expanded to a more negative limit.

The revision to the negative $f(\Delta I)$ penalty does not affect the normal plant operating parameters, the safeguards systems actuations or accident mitigation capabilities, or the assumptions used in loss-of-coolant-accident (LOCA) and non-LOCA events, nor does it adversely affect the results of these analyses. It will provide additional margin to prevent a plant trip during a load rejection transient.

Therefore, the staff concludes that the implementation of the revision to the negative $f(\Delta I)$ penalty beginning in Cycle 10 will not adversely affect the subsequent safe operation of IP3 and the proposed change is acceptable.

The staff has reviewed the licensee's request to increase the allowable span for a zero $f(\Delta I)$ penalty in the OTAT trip function to -15.75% through +6.9%. Based on the staff's evaluation, the proposed change will not adversely affect the subsequent safe operation of IP3 beginning in Cycle 10 and is, therefore, acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (62 FR 54876). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: L. Kopp

Date: January 26, 1998