



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

July 25, 1994

Docket No. 50-286

Mr. William A. Josiger, Acting Executive  
Vice President - Nuclear Generation  
Power Authority of the State of New York  
123 Main Street  
White Plains, New York 10601

Dear Mr. Josiger:

SUBJECT: ISSUANCE OF AMENDMENT FOR INDIAN POINT NUCLEAR GENERATING  
UNIT NO. 3 (TAC NO. M89463)

The Commission has issued the enclosed Amendment No. 149 to Facility Operating License No. DPR-64 for the Indian Point Nuclear Generating Unit No. 3. The amendment consists of changes to the Technical Specifications in response to your application transmitted by letter dated May 10, 1994.

The amendment revises Section 3.1.C.3 and Table 4.1-1 of Appendix A of the Operating License. These changes require that the reactor coolant average temperature ( $T_{avg}$ ) be no lower than 540 °F during critical operation. Critical operation at  $T_{avg}$  less than 540 °F will require operator response to restore  $T_{avg}$  to  $\geq 540$  °F within 15 minutes or be in hot shutdown within the following 15 minutes. Additionally, the change in Table 4.1-1 entitled, "Minimum Frequencies for Checks, Calibrations and Tests," will add the requirement for  $T_{avg}$  instrument check frequency to be reduced to 30 minutes when the  $T_{avg}$  deviation and low  $T_{avg}$  alarms are not reset and the control banks are above zero steps. Furthermore, the revision to the Bases indicates that the minimum temperature for criticality provides assurance that the reactor is operated within the bounds of the safety analyses. Also included is an administrative change to correct some typographical errors on page 3.1-25 of the Technical Specifications.

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Mr. William A. Josiger

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July 25, 1994

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,



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

Enclosures:

1. Amendment No. 149 to DPR-64
2. Safety Evaluation

cc w/enclosures:  
See next page

Mr. William A. Josiger, Acting  
Power Authority of the State  
of New York

Indian Point Nuclear Generating  
Station Unit No. 3

cc:

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New York, New York 10271

DATED: July 25, 1994

AMENDMENT NO. 149 TO FACILITY OPERATING LICENSE NO. DPR-64-INDIAN POINT UNIT 3

Docket File  
NRC & Local PDRs  
PDI-1 Reading  
S. Varga, 14/E/4  
J. Calvo, 14/A/4  
M. Boyle  
C. Vogan  
N. Conicella  
OGC  
D. Hagan, 3302 MNBB  
G. Hill (2), P1-22  
C. Grimes, 11/F/23  
M. Gareri  
ACRS (10)  
OPA  
OC/LFDCB  
PD plant-specific file  
C. Cowgill, Region I

cc: Plant Service list

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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. 149  
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 May 10, 1994, 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:

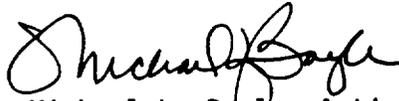
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 149, 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



Michael L. Boyle, Acting 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: July 25, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 149

FACILITY OPERATING LICENSE NO. DPR-64

DOCKET NO. 50-286

Revise Appendix A as follows:

Remove Pages

3.1-25

Table 4.1-1 (1 of 6)

Insert Pages

3.1-25

Table 4.1-1 (1 of 6)

C. MINIMUM CONDITIONS FOR CRITICALITY

1. Except during low power physics test, the reactor shall not be made critical at any temperature above which the moderator temperature coefficient is positive.
2. This section intentionally deleted.
3. At all times during critical operation, the lowest loop  $T_{avg}$  shall be no lower than 540 °F.
  - a. If  $T_{avg}$  is less than 540°F when the reactor is critical, restore  $T_{avg}$  to  $\geq 540$  °F within 15 minutes or be in hot shutdown within the following 15 minutes.
4. The reactor shall be maintained subcritical by at least  $1\% \frac{\Delta k}{k}$  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 concentration in the coolant will be lower and the moderator coefficient 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 coefficient 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 an increase in moderator temperature. This requirement is waived during low 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 except when  $T_{avg}$  is  $\geq 540$  °F provides assurance that an overpressure event will not occur whenever the reactor vessel is in the nil-ductility temperature range and that the reactor is operated within the bounds of the safety analyses. The safety analyses, which assume a critical temperature of 547 °F, are applicable for critical temperatures as low as 540 °F. Heatup to this temperature will be accomplished by operating the reactor coolant pumps. The Surveillance requirement to support this specification is provided in Table 4.1-1 item no. 4.

The requirement for bubble formation in the pressurizer when the reactor has passed the threshold of  $1\%$  subcriticality will assure that the reactor coolant not be solid when criticality is achieved.

References:

1. FSAR Table 3.2-1
2. FSAR Figure 3.2-9

**TABLE 4.1-1** (Sheet 1 of 6)

<b>MINIMUM FREQUENCIES FOR CHECKS, CALIBRATIONS AND TESTS OF INSTRUMENT CHANNELS</b>				
<u>Channel Description</u>	<u>Check</u>	<u>Calibrate</u>	<u>Test</u>	<u>Remarks</u>
1. Nuclear Power Range	S	D (1) M (3)*	Q (2)** Q (4)	1) Heat balance calibration 2) Bistable action (permissive, rod stop, trips) 3) Upper and lower chambers for axial offset 4) Signal to $\Delta T$
2. Nuclear Intermediate Range	S (1)	N.A.	P (2)	1) Once/shift when in service 2) Verification of channel response to simulated inputs
3. Nuclear Source Range	S (1)	N.A.	P (2)	1) Once/shift when in service 2) Verification of channel response to simulated inputs
4. Reactor Coolant Temperature	S (3)	18M (1) 24M (2)	Q (2)	1) Engineered safety circuits only 2) Reactor protection circuits only 3) Normal Instrument check interval is once/shift T <sub>avg</sub> instrument check interval reduced to every 30 minutes when: <ul style="list-style-type: none"> <li>- T<sub>avg</sub> deviation and low T<sub>avg</sub> alarms are not reset and,</li> <li>- Control banks are above 0 steps</li> </ul>
5. Reactor Coolant Flow	S	24M	Q	
6. Pressurizer Water Level	S	18M	Q	
7. Pressurizer Pressure	S	18M	Q	High and Low
8. 6.9 KV Voltage 6.9 KV Frequency	N.A. N.A.	18M 24M	Q Q	Reactor protection circuits only Reactor protection circuits only
9. Analog Rod Position	S	24M	M	



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 149 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 May 10, 1994, the Power Authority of the State of New York (the licensee) submitted a request for changes to the Indian Point Nuclear Generating Unit No. 3 (IP3) Technical Specifications (TSs). The requested changes would revise Section 3.1.C.3 and Table 4.1-1 of Appendix A of the Operating License. These changes would require that the reactor coolant average temperature ( $T_{avg}$ ) be no lower than 540 °F during critical operation. Critical operation at  $T_{avg}$  less than 540 °F would require operator response to restore  $T_{avg}$  to  $\geq 540$  °F within 15 minutes or be in hot shutdown within the following 15 minutes. Additionally, a change in Table 4.1-1 entitled, "Minimum Frequencies for Checks, Calibrations and Tests," would add the requirement for  $T_{avg}$  instrument check frequency to be reduced to 30 minutes when the  $T_{avg}$  deviation and low  $T_{avg}$  alarms are not reset and the control banks are above zero steps. Furthermore, the associated TS Bases would indicate that the minimum temperature for criticality provides assurance that the reactor is operated within the bounds of the safety analyses and typographical errors on page 3.1-25 would be corrected.

2.0 EVALUATION

The minimum temperature for criticality is the lowest moderator temperature supported by the licensing basis safety analyses when criticality is assumed to occur. The IP3 current licensing basis safety analyses explicitly assume a minimum temperature for criticality corresponding to no-load temperature of 547 °F. However, the licensee has demonstrated that a minimum temperature for criticality of 540 °F, which is 7 °F below the no-load temperature, can be supported by the licensing basis safety analyses. The current IP3 TSs prohibit critical operation with the reactor coolant temperature  $T_{avg}$  below 450 °F. This specification is the only reference to the minimum temperature for criticality in the TSs and may result in possible misinterpretation. Therefore, changing the minimum temperature for criticality from 450 °F to 540 °F will continue to protect the vessel in the nil-ductility temperature range and will also make the temperature consistent with the safety analyses.

There are no reactor trips which are actuated with drift of  $T_{avg}$  below the program value thus there are no trips associated with minimum temperature for criticality. However, alarms are actuated if the drift of indicated  $T_{avg}$  from program  $T_{avg}$ , such as  $T_{ref}$ , is sufficiently large alerting operator that  $T_{avg}$  is in danger of falling below the minimum temperature for criticality.

There are no acceptance criteria on the minimum temperature for criticality that relate to fundamental safety limits. Each design basis accident for which the moderator temperature is an initial condition has its own relevant safety limit acceptance criteria. The licensing basis events which assume no-load  $T_{avg}$  initial conditions include Feedwater Malfunction event from zero power initial conditions, the Rupture of a Steam Pipe Event, and the Chemical and Volume Control System (CVCS) Malfunction event during startup conditions.

Section 3.1.C of the TSs currently provides the minimum conditions for criticality which ensures that the reactor is not made critical when the moderator coefficient is positive, thus preventing any unexpected power excursion during normal operations as a result of an increase in moderator temperature. This section also provides increased assurance that an overpressure event will not occur whenever the reactor vessel is in the nil-ductility temperature range. As stated earlier, changing the minimum temperature for criticality from 450 °F to 540 °F will continue to protect the vessel in the nil-ductility temperature range and will also make the temperature consistent with the safety analyses. Therefore, a minimum temperature for criticality within 7 °F below the no-load temperature of 547 °F does not adversely affect the design basis for the accident analyses events with respect to pressurizer control availability.

The information provided by the licensee shows that the small change of  $\leq 7$  °F in the no-load  $T_{avg}$  assumed in the safety analyses will not affect core kinetics parameters, peaking factors, reactor protection and control systems response, fuel performance, and balance of plant integrity. Specifically, with respect to the Rod Cluster Control Assembly (RCCA) Ejection and Uncontrolled RCCA Withdrawal From a Subcritical Condition events which assume no-load  $T_{avg}$  initial conditions, the difference in safety analyses results if analyzed at an initial  $T_{avg}$  condition 7 °F lower is negligible. The proposed changes will make the Minimum Temperature for Criticality Specification (540 °F) more restrictive than the current specification which allows reactor criticality at a temperature as low as 450 °F. The proposed changes will also make the minimum temperature for criticality consistent with the licensing basis safety analyses. In addition, critical operation at  $T_{avg}$  less than 540 °F will require operator response to restore  $T_{avg}$  to  $\geq 540$  °F within 15 minutes or be in hot shutdown within the following 15 minutes. Therefore, the minimum temperature for criticality when defined to be within 7 °F below the no-load  $T_{avg}$  value of 547 °F does not adversely affect pressurizer operability, reactor vessel nil-ductility temperature, the reactor protection system operability, nor the plant design basis analyses and is supported by the current licensing basis safety analyses. The additional requirement to increase surveillance to every 30 minutes (in Table 4.1-1) for the  $T_{avg}$

instrument check, when  $T_{avg}$  deviation and low  $T_{avg}$  alarms are not reset and the control banks are above zero steps, will be adequate to prevent the inadvertent violation of the limiting conditions for operation (LCO).

In summary, review of the proposed changes show that the changes do not involve the addition of any new or different type of equipment, nor do they involve the operation of equipment required for safe operation of the facility in a manner different from those addressed in the Final Safety Analysis Report (FSAR). The proposed changes do not affect any safety related system or component operation or operability, instrument operation, or safety system setpoints. The safety analyses, which assume a critical temperature of 547 °F, are applicable for critical temperatures as low as 540 °F. The proposed changes will ensure that the plant parameters are within their analyzed ranges and will increase the surveillance frequency for the  $T_{avg}$  instrument check when the  $T_{avg}$  deviation and low  $T_{avg}$  alarms are not reset and the control banks are above zero steps. The proposed application also corrects typographical errors on page 3.1-25 of the TSs to read FSAR Table 3.2-1 and not FSAR Table 3.2.1-1. It also corrects FSAR Figure 3.2.1-9 to read FSAR Figure 3.2-9.

Based on the information provided by the licensee, the staff finds all of the above proposed changes to be 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 (59 FR 29630). 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:  
M. Gareri

Date: July 25, 1994

Mr. William A. Josiger

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July 25, 1994

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:

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

Enclosures:

1. Amendment No.149 to DPR-64
2. Safety Evaluation

cc w/enclosures:  
See next page

PDI-1:LA	PDI-1:PM <i>for</i>	PDI-1:PM <i>for</i>	SRXB <i>to</i>	OGC <i>for</i>	PDI-1:D
CVogan <i>CV</i>	MGareri:avl	NConicella	TCollins	<i>AT</i>	MBoyle <i>MB</i>
6/15/94	6/15/94	6/15/94	6/17/94	6/30/94	7/25/94

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