

July 7, 1987

Docket No. 50-286

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Mr. John C. Brons  
Executive Vice President - Nuclear Generation  
Power Authority of the State of New York  
123 Main Street  
White Plains, New York 10601

Dear Mr. Brons:

The Commission has issued the enclosed Amendment No. 76 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 February 9, 1987 (TAC 64633).

The amendment modifies the definition of Tube Inspection to reflect the definition recommended in Generic Letter 85-02. In addition it deletes the historical references to the tube plugging limit of 63% degradation which was valid for Cycle 4 only. Table 4.9-1 is revised to reflect that a defective tube may be repaired by plugging or sleeving. Additionally, the Bases for Section 4.9 has been revised and updated to provide new information for wastage-type defects.

The February 9, 1987 submittal requested that the Technical Specifications be revised to permit resumption of power operation without prior NRC approval subsequent to a steam generator inspection whose results have been classified as C-3 (i.e., all tubes were inspected per the provisions of Table 4.9-1 of the Technical Specifications). This portion of the request is being denied.

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

Sincerely,

Marylee M. Slosson, Project Manager  
Project Directorate I-1  
Division of Reactor Projects, I/II

Enclosures:

- 1. Amendment No. 76 to DPR-64
- 2. Safety Evaluation

cc: w/enclosures  
See next page

\* SEE PREVIOUS CONCURRENCE

PDI-1  
CVogan\*  
5/12/87

PDI-1  
MSlosson\*  
5/12/87

OGC  
MKarman\*  
5/13/87

PDI-1  
RCapra  
5/17/87

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PDR ADOCK 05000284  
PDR

*MS*  
*6-30-87*  
*changes made per J. Scento's 5/27/87 comments*

Docket No. 50-286

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Senior Vice President - Nuclear Generation  
Power Authority of the State of New York  
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White Plains, New York 10601

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Dear Mr. Brons:

The Commission has issued the enclosed Amendment No. 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 February 9, 1987 (TAC 64633).

The amendment revises the Technical Specifications to permit the resumption of power operation without prior NRC approval subsequent to a steam generator inspection whose results have been classified as C-3 (i.e., all tubes were inspected per the provisions of Table 4.9-1 of the Technical Specifications). The amendment modifies the definition of Tube Inspection to reflect the definition recommended in Generic Letter 85-02. In addition it deletes the historical references to the tube plugging limit of 63% degradation which was valid for Cycle 4 only. Table 4.9-1 is revised to reflect that a defective tube may be repaired by plugging or sleeving. Additionally, the Bases for Section 4.9 has been revised and updated to provide new information for wastage-type defects.

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Sincerely,

Marylee M. Slosson, Project Manager  
Project Directorate I-1  
Division of Reactor Projects, I/II

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OGC  
*M. Hagan*  
5/13/87

PDI-1  
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5/ /87



Mr. John C. Brons  
Power Authority of the State  
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Unit No. 3

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- 2 -

Indian Point 3

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

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. 76  
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 February 9, 1987, 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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P PDR

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 76, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

*Joseph D. Neighbors*  
for Robert A. Capra, Acting Director  
Project Directorate I-1  
Division of Reactor Projects, I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: July 7, 1987



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

ATTACHMENT TO LICENSE AMENDMENT NO. 76  
FACILITY OPERATING LICENSE NO. DPR-64  
DOCKET NO. 50-286

Revise Appendix A as follows:

<u>Remove Pages</u>	<u>Insert Pages</u>
4.9-1	4.9-1
4.9-1a	4.9-1a
4.9-4a	----
4.9-5	4.9-5
4.9-6	4.9-6
Table 4.9-1	Table 4.9-1

#### 4.9 STEAM GENERATOR TUBE INSERVICE SURVEILLANCE

##### Applicability

Applies to inservice surveillance of the steam generator tubes.

##### Objective

To assure the continued integrity of the steam generator tubes that are a part of the primary coolant pressure boundary.

##### Specification

Steam generator tubes shall be determined operable by the following inspection program and corrective measures:

#### A. Inspection Requirements

##### 1. Definitions

- a. Imperfection is an exception to the dimension, finish, or contour required by drawing or specification.
- b. Degradation means a service-induced cracking, wastage, wear or corrosion.
- c. Degraded Tube is a tube that contains imperfections caused by degradation large enough to be reliably detected by eddy current inspection. This is considered to be 20% degradation.
- d. % Degradation is an estimate % of the tube wall thickness affected or removed by degradation.
- e. Defect is an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.
- f. Tube Plugging Limit is the tube imperfection depth at or beyond which the tube must either be removed from service or repaired. This is considered to be an imperfection depth of 40%.
- g. Sleeve Plugging Limit is the sleeve imperfection depth at or beyond which the sleeved tube must be removed from service or repaired. This is considered to be an imperfection depth of 40% for tube sleeves.

- h. Tube Inspection is a full length inspection for the initial 3% sample specified in Table 4.9-1. Supplemental sample inspections (after the initial 3% sample) may be limited to a partial length inspection concentrating on those locations where degradation has been found.

3. Results of steam generator tube inspections which fall into Category C-3 of Table 4.9-1 require notification of the Commission within 15 days of this determination\*. The written followup of this report shall provide a description of investigations conducted to determine the cause of the tube degradation and corrective measures taken to prevent recurrence.

\*Note - Table 4.9-1 requires NRC approval prior to startup in one case.

### Basis

Inservice surveillance of steam generator tubes is essential in order to ensure that the structural integrity of this portion of the RCS is maintained. This inservice surveillance consists of an inspection program which provides a means of identifying and characterizing the nature of any mechanical damage or tube degradation so that corrective measures can be taken. Degradation could be caused by design or fabrication deviations or inservice conditions that lead to corrosion.

An essentially 100% tube inspection was performed on each tube in every steam generator by eddy current techniques prior to service in order to establish a baseline condition for the tubing. This inspection was conducted under conditions and with equipment and techniques equivalent to those expected to be employed in the subsequent inservice inspections.

The program for inservice inspection of steam generator tubes including equipment, procedures, and sample selection is based upon the guidance and recommendations in Regulatory Guide 1.83 and NRC Generic Letter 85-02. The program includes a full length inspection for the initial 3% sample recommended in the regulatory guide followed by supplementary tube sampling and inspection if necessary based upon the results of the initial sample. The initial sample inspection may include separate entries from the hot and cold leg sides and selection of different tubes on the hot and cold leg sides to satisfy the minimum sampling requirements. Supplementary inspections need not be full length and should concentrate on areas of known degradation. The detailed sampling process based upon the regulatory guide is defined in section 4.9.A.2, 4.9.A.3, and Table 4.9-1 of this section, and the frequency of inspection in 4.9.A.4.

Following the pre-service inspection, the plant is expected to be operated in a manner such that the secondary coolant will be maintained within those limits

found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these limits, localized corrosion may result in stress corrosion cracking. If stress corrosion cracking occurs during plant operation, its extent would be limited by the limitation of steam generator tube leakage between the primary coolant system and the secondary coolant system which is 500 gallons per day per steam generator. Cracks having a primary to secondary leakage less than this limit during operation have an adequate margin of safety against failure due to loads imposed by design basis accidents. Operating plants have demonstrated that primary to secondary leakage as low as 0.1 gpm can be detected. Leakage in excess of the 500 gallon per day per steam generator limit requires plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and plugged or repaired. This limit is also consistent with the assumptions used to develop the Technical Specification limit for secondary coolant activity. For Indian Point 3, for conservatism, the plant will be shutdown if leakage exceeds 432 gallons per day per steam generator or 1 gpm total through all four steam generators and an unscheduled eddy current inspection will be conducted. Leaking and defective tubes will be located and either; (1) plugged or (2) repaired.

If the results of an inservice inspection conducted as described previously show any tube with an imperfection exceeding 40% of the tube nominal wall thickness, the tube is unacceptable for continued operation and must be plugged or repaired as required by the ASME Code. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original 0.050 inch nominal wall thickness. In accordance with Regulatory Guide 1.121, a plugging margin evaluation has demonstrated that the actual remaining wall thickness for flaws with axial extent not exceeding 0.9 inches and circumferential extent not exceeding 135° to withstand the max DP expected during faulted conditions is 28%. This is also supported by burst test data of representative tubing. Leak before break has also been verified for this extent of degradation. Since this provides for 72% wall loss, a 40% plugging limit incorporates a 32% margin. A 10% margin is applied to measurement inaccuracies leaving 22% safety margin for corrosion allowance during a given operating period prior to the next inspection.

TABLE 4.9-1

STEAM GENERATOR TUBE INSPECTION

First Sample Inspection			Second Sample Inspection		Third Sample Inspection		
Minimum Size	Result	Action	Result	Action	Result	Action	
S* Tubes per steam generator	C-1						
	C-2	Plug or repair defective tubes.  Inspect additional 2S tubes in this SG.	C-1			▶	
			C-2	Plug or repair defective tubes. Inspect additional 4 S tubes in this SG.	C-1	▶ Go to power.	
			C-2		C-2	▶ Plug or repair defective tubes. Go to power.	
	C-3	Inspect all tubes in this SG. Plug or repair defective tubes.  Inspect 2 S tubes in each other SG	C-3	Go to first sample. C-3 action	C-3	▶ Go to first sample. C-3 action	
			All other SGs C-1			▶ Go to power	
			Some SGs C-2 But no add'l C-3	Go to second sample. C-2 action			
			Add'l SG C-3	Inspect all tubes in all SGs. Plug or repair defective tubes.		▶ Report to NRC NRC approval req'd prior to startup	

\*  $S = 3 \frac{N}{n} \%$  where N is the number of steam generators in the plant, and n is the number of steam generators inspected to satisfy the full length inspection criteria of 4.9.A.1 .

Category C-1: Less than 5% of the total tubes inspected are degraded tubes and none of them is defective.

Category C-2: One or more of the total tubes inspected is defective but not more than 1% of the tubes inspected or between 5 and 10% of the tubes inspected are degraded tubes.

Category C-3: More than 10% of the total tubes inspected are degraded or more than 1% of the tubes inspected are defective.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 76 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

INTRODUCTION

By letter dated February 9, 1987, The Power Authority of the State of New York (the licensee) seeks to amend Section 4.9 of the Technical Specifications appended to the operating license. The proposed change modifies the definition of Tube Inspection to reflect the definition recommended in Generic Letter 85-02. In addition, it is proposed to delete historical references to the tube plugging limit of 63% degradation which were valid for Cycle 4 only. Table 4.9-1 is revised to reflect that a defective tube may be repaired by plugging or sleeving. Additionally, the Bases for Section 4.9 has been revised and updated to provide new information for wastage-type defects.

The licensee also requested a proposed change that would permit the resumption of power operation without prior NRC approval subsequent to a steam generator inspection whose results have been classified as C-3 (i.e., all tubes were inspected per the provisions of Table 4.9-1 of the Technical Specifications).

DISCUSSION AND EVALUATION

The Indian Point 3 Technical Specifications currently require sample inspections from the hot leg side of the tubesheet to the top support on the cold leg side. In light of the degradation on the cold leg side, full length tube inspections will be performed for the initial 3% sample defined in Table 4.9-1. Additional sample inspections may be limited to a partial length inspection concentrating on those locations where degradation has been found. This definition of tube inspection is that recommended by Generic Letter 85-02, "Staff Recommended Actions Stemming from NRC Integrated Program for the Resolution of Unresolved Safety Issues Regarding Steam Generator Tube Integrity".

For Cycle 4 only, the plugging limit was increased to 63% degradation from 40% degradation. Upon completion of Cycle 4 operations the tube plugging limit reverted to 40%. The references to the 63% tube plugging limit in Section 4.9 are being deleted for the sake of clarity since they no longer apply.

Table 4.9-1, which contains required actions depending upon tube inspection results, has been revised to reflect that a defective tube may be repaired or plugged. Repair by sleeving of defective tubes was previously permitted by License Amendment No. 47. This change constitutes a clarification to reflect a previously approved alternative to plugging defective tubes.

Bases Section 4.9 for steam generators has been revised and updated to provide a current rationale for Technical Specification 4.9. Historical information was either deleted or updated. Statements in the Bases section addressing wastage-type defects have been revised to reflect information acquired during the steam generator inspection performed during the Cycle 4/5 refueling outage and subsequent analyses. These changes are an improvement to the Bases supporting the steam generator surveillance requirements.

The staff concludes that the incorporation of these changes will not decrease the integrity of the steam generator tubes. The voluntary adoption of tube inspection by a full "U" rather than a "J" as currently defined in the Westinghouse Standard Technical Specification will result in improved inspections and will ensure the continued inspection of the cold leg side, where degradation has been previously identified. Further, the staff concurs in the elimination of the historical reference to the 63% plugging criterion which was valid for Cycle 4 only. The proposed revisions dealing with wastage and sleeving are basically clarifications and are therefore acceptable.

In addition to the above acceptable changes, the licensee proposed to delete the provision for approval prior to resuming power operation subsequent to a steam generator inspection whose results have been classified as C-3. The deletion of this requirement is not acceptable. The Indian Point 3 Steam Generator is one in which severe tube degradation has occurred. Because of this, close staff review is required. There is no basis for removal of the approval requirement at this time.

#### ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 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 this amendment.

CONCLUSION

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: July 7, 1987

PRINCIPAL CONTRIBUTOR:

D. Sellers