MAY 13 1982

Docket No. 50-272

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Mr. Richard A. Uderitz
Vice President - Nuclear
Public Service Electric and Gas Company
Mail Code T15A - P. O. Box 570
Newark, New Jersey 07101

Dear Mr. Uderitz:

The Commission has issued the enclosed Amendment No. 43 to Facility Operating License No. DPR-70 for the Salem Nuclear Generating Station, Unit No. 1. This amendment consists of changes to the Technical Specifications in response to your request dated February 5, 1982, as supplemented by letter dated March 5, 1982.

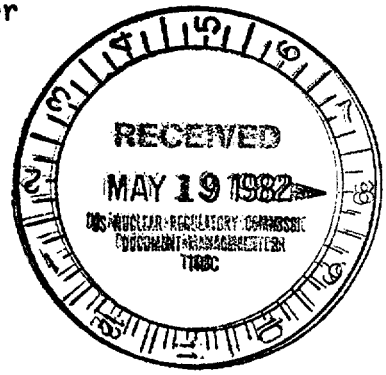
The amendment modifies the Technical Specifications to provide an alternate sampling method for steam generator tube inspections during the refueling outage for Cycle 4.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

ORIGINAL SIGNED

William J. Ross, Project Manager
Operating Reactors Branch #1
Division of Licensing



Enclosures:
1. Amendment No. 43 to DPR-70
2. Safety Evaluation
3. Notice of Issuance

cc w/encls:
See next page

FR Notice + Amendment

OFFICE	DL:ORB#1	DL:ORB#1	DL:ORB#1	DD:OR	OELD	AD:MOE	
SURNAME	CParrish	WRossims	SAVarga	EJNovak		WJohnston	
DATE	4/19/82	4/16/82	4/22/82	5/3/82	4/ /82	4/28/82	

Mr. R. A. Uderitz
Public Service Electric and Gas Company

cc: Mark J. Wetterhahn, Esquire
Conner and Wetterhahn
1747 Pennsylvania Avenue, NW
Suite 1050
Washington, D.C. 20006

Richard Fryling, Jr., Esquire
Assistant General Solicitor
Public Service Electric and Gas Company
Mail Code T5E - P.O. Box 570
Newark, New Jersey 07101

Gene Fisher, Bureau of Chief
Bureau of Radiation Protection
380 Scotch Road
Trenton, New Jersey 08628

Mr. Henry J. Midura, General Manager - Salem Operations
Public Service Electric and Gas Company
P.O. Box 168
Hancocks Bridge, New Jersey 08038

Salem Free Library
112 West Broadway
Salem, New Jersey 08079

Leif J. Norrholm, Resident Inspector
Salem Nuclear Generating Station
U. S. Nuclear Regulatory Commission
Drawer I
Hancocks Bridge, New Jersey 08038

Richard F. Engel
Deputy Attorney General
Department of Law and Public Safety
CN-112
State House Annex
Trenton, New Jersey 08625

Samuel E. Donelson, Mayor
Lower Alloways Creek Township
Municipal Hall
Hancocks Bridge, New Jersey 08038

June D. MacArtor, Esquire
Deputy Attorney General
Tatnall Building
P.O. Box 1401
Dover, Delware 19901

Richard B. McGlynn, Commissioner
Department of Public Utilities
State of New Jersey
101 Commerce Street
Newark, New Jersey 07102

Regional Radiation Representatives
EPA Region II
26 Federal Plaza
New York, New York 10007

Mr. R. L. Mittl, General Manager - Corporate Quality Assurance
Public Service Electric and Gas Company
Mail Code T16D - P.O. Box 570
Newark, New Jersey 07101

Lower Alloways Creek Township
c/o Mary O. Henderson, Clerk
Municipal Building, P.O. Box 157
Hancocks Bridge, New Jersey 08038

Mr. Alfred C. Coleman, Jr.
Mrs. Eleanor G. Coleman
35 K Drive
Pennsville, New Jersey 08070

Mr. Dale Bridenbaugh
M.H.B. Technical Associates
1723 Hamilton Avenue, Suite K
San Jose, California 95125

Mr. Edwin A. Liden, Manager Nuclear Licensing and Regulation
Public Service Electric and Gas Company
Mail Code T16D - P.O. Box 570
Newark, New Jersey 07101

Carl Valore, Jr., Esquire
Valore, McAllister, Aron and Westmoreland, P.A.
535 Tilton Road
Northfield, New Jersey 08225

Ronald C. Haynes
Regional Administrator - Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, Pennsylvania 19406

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

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
PHILADELPHIA ELECTRIC COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 43
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated February 5, 1982, as supplemented March 5, 1982 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-70 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 43 , 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

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 13, 1982

ATTACHMENT TO LICENSE AMENDMENT NO. 43

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 4-13	3/4 4-13 3/4 4-13a

TABLE 4.4-2

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	* Action Required	Result	* Action Required	Result	* Action Required
A minimum of S Tubes per S. G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug defective tubes and inspect additional 2S tubes in this S. G.	C-1	None	N/A	N/A
			C-2	Plug defective tubes and inspect additional 4S tubes in this S. G.	C-1	None
					C-2	Plug defective tubes
					C-3	Perform action for C-3 result of first sample
			C-3	Perform action for C-3 result of first sample	N/A	N/A
	C-3	Inspect all tubes in this S. G., plug defective tubes and inspect 2S tubes in each other S. G. Prompt notification to NRC pursuant to specification 6.9.1	All other S. G.s are C-1	None	N/A	N/A
			Some S. G.s C-2 but no additional S. G. are C-3	Perform action for C-2 result of second sample	N/A	N/A
			Additional S. G. is C-3	Inspect all tubes in each S. G. and plug defective tubes. Prompt notification to NRC pursuant to specification 6.9.1	N/A	N/A

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

*Alternate action may be used in accordance with paragraph (See next page)

Alternate Action

During the third refueling outage surveilance examinations, indications associated with wall reduction were detected on the tubing of No. 12 and No. 14 Steam Generators. The condition was established as occurring on the outside diameter of tubes located around the periphery of the tube sheet on the cold leg side at the intersections of the first, second, and third support plates.

During the third refueling outage the following action may be taken in place of that required by Table 4.4-2 when the results of the initial sample require that an additional sample or samples must be inspected and the condition for which the added inspection is required is limited to the peripheral tubes:

1. The second inspection sample shall, as a minimum, include an area of 5 tubes inward, measured from the innermost defective or degraded tube and in an arc completely around that side of the steam generator (cold leg or hot leg) where the initial indications are found.

2. Subsequent samples shall be taken in a similar manner if degraded or defective tubes are found in the second sample inspection.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 43 TO FACILITY OPERATING LICENSE NO. DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,
PHILADELPHIA ELECTRIC COMPANY,
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

INTRODUCTION

Eddy current inspection of the steam generator tubes during the current outage at Salem 1 revealed numerous cold leg indications in each steam generator. These indications are limited to the peripheral region of the tube bundle and are located at the tube support plate intersections. The degradation phenomenon is believed to involve localized wall thinning similar to what has been observed in recent years at Prairie Island Unit 2.

Upon the finding of these indications, the initial inspection program was expanded to include all tubes in the peripheral region of each steam generator where the degradation activity is believed to be confined. For steam generator 14, a sufficient number of pluggable indications have been found such that the Technical Specifications require that the inspection program be expanded to include all tubes in that steam generator. However, based upon the inspections which have been completed, the licensee concludes that additional tube inspections in steam generator 14 will not provide any significant additional information or safety to justify the added personnel exposures which would be incurred. Therefore, the licensee has requested, by letter dated February 5, 1982, a change to the Plant Technical Specifications which would

allow for an alternative course of action, in lieu of what is currently required by the Technical Specifications, when the results of initial inspection sampling require that additional samples must be inspected and when the condition for which the added inspections are required is limited to the peripheral tubes. Under the proposed change, subsequent inspection samples would, in effect, include all peripheral tubes within an arc extending a minimum of five tubes inward of the inner-most degraded or defective tube. The licensee has indicated by phone that it is their intent that the proposed change would only be applicable to the inspections performed during the current outage.

In addition to the Technical Specification change request, this safety evaluation also addresses two interpretations of Technical Specifications made by the licensee which differ from the staff's interpretation.

DISCUSSION

The licensee's initial program consisted of a 15% tube sample (508 tubes) from steam generator 12 only. The sampling program included a random sampling of the entire tube bundle, with special emphasis on particular regions of the tube bundle (e.g., row 1 tubes, peripheral tubes including hardspot areas) as indicated by operating experience at other Westinghouse units. All tubes in the sample were inspected through the hot leg and around the U-bend to at least the top support on the cold leg side in accordance with Technical Specification requirements. For 230 tubes in the sample, the licensee elected to inspect all the way to the tube outlet on the cold leg side.

The results of this initial inspection program revealed 3 pluggable indications at the lower support plate elevations affecting tubes at the periphery of the bundle on the cold leg side. No indications were found in the interior of the bundle and no hot leg indications were found. In accordance with the Technical Specifications, these findings necessitated additional tube inspections. All subsequent tube inspections in steam generator 12 and in the other steam generators were performed from the cold leg side to the top support on the cold leg side, with only a very limited sampling of the hot leg side (see Table below). This is consistent with the Technical Specifications which specify that when results of initial inspection samples indicate that additional samples are to be taken, the tubes in these subsequent samples may be subject to a partial length inspection provided it includes the portion of the tubing where the degradation phenomenon was observed during initial sampling.

Additional tube inspections were initially performed in steam generator 12 and 14 to fulfill Technical Specification requirements. The additional inspections in steam generator 12 (12% sample) were performed exclusively in the peripheral region of the bundle, and no additional indications were found. The initial 7% sample taken in steam generator 14 included tubes in the peripheral region of the bundle and in the interior. Several indications (13 total including 2 pluggable indications) were found, again confined to the periphery of the cold leg, at the lower three support plate elevations. As required by the Technical Specifications, an additional 12%

sample was taken in steam generator 14, exclusively at the periphery of the bundle. A sufficient number of pluggable (> 40% indications) was found (> 1% of the number of tubes in the sample contained pluggable indications) to place the steam generator 14 inspection results in the C-3 category as defined by the Technical Specifications. For category C-3, the inspection program must be expanded to include all tubes in the affected steam generator. After inspecting an additional 916 tubes in a wide arc around the periphery (and proceeding inward toward the interior of the bundle), no evidence of further degradation was found and the inspection of steam generator 14 was discontinued pending NRC approval of the requested Technical Specification change.

As an additional consequence of the C-3 inspection results category in steam generator 14, the licensee was required to perform a 6% inspection sample in steam generators 11 and 13. These inspections were performed exclusively in the peripheral region of the bundle and resulted in the finding of 7 degraded tubes (tubes with indications less than the plugging limit) in steam generator 11 and 4 degraded tubes in steam generator 13. No pluggable indications were found and no further inspections were required by the Technical Specifications. However, the licensee elected to perform additional inspections in both steam generators, which resulted in the finding of three additional degraded tubes in steam generator 13, until all peripheral tubes within an arc extending four to five tubes inboard of the innermost indication found had been inspected.

In all of the steam generators, the cold leg indications were generally confined to within three rows of the periphery, at one of the lower three support plate intersections. However, three indications found in steam generator 13 deviated from this pattern, being located seven rows in from the periphery, at the third, fifth, and sixth support elevations. Our review indicates that these locations were included in the peripheral zone which received an 100% inspection in steam generators 11 and 14, but are located one to three rows inboard of the peripheral zone which was 100% inspected in steam generator 12.

A summary of the inspections performed and the results obtained is provided below:

Cold Leg Inspections

	No. of Tubes Inspected	No. of Tubes with Indications 20 to 39%	No. of Tubes with Indications ≥40%	Max. Indication
SG 11	1430	5	0	39%
SG 12	642	0	3	55%
SG 13	852	7	0	36%
SG 14	1698	24	8	54%
	Hot Leg Inspections			
SG 11	62	1	0	24%
SG 12	539	0	0	-
SG 13	50	0	0	-
SG 14	89	0	0	-

Steam generators 11 and 13 had been previously inspected in Fall 1980, including several tubes which now exhibit indications ranging to %. Steam generators 12 and 14 had been previously inspected in 1979, including several tubes which now exhibit indications ranging to %. None of these tubes had exhibited detectable indications during the previous inspections which were performed using single frequency (400 KHZ) ECT. Inspections performed during the current outage employed the more sophisticated multifrequency ECT technique which provides enhanced operator capability to detect defect signals against sources of background noise including the support plates.

The Technical Specification plugging limit for Salem 1 is 40%. However, because of the potentially high rate of corrosion, the licensee elected to plug all tubes containing greater than 30% indications as a precautionary measure. The Salem-1 steam generators are scheduled for reinspection during an outage which is expected to occur in approximately seven months.

The licensee removed one tube containing a 59% indication for laboratory metallurgical examination and chemical analysis. Only preliminary visual examination of the tube has been performed to date. The defect appears as a broad pit or localized wall thinning (similar to what has been observed at Prairie Island 2) penetrating approximately halfway through wall at the location of the second support plate.

One of 50 tubes which was sampled on the hot leg side of steam generator 11 exhibited two 24% indications located 20" and 40" above the fifth support plate, respectively, on the hot leg side. This tube is located at the perimeter of the tube bundle. Twelve additional tubes were inspected in a tight cluster around this tube, but no additional hot leg indications were found. A review of the ECT tapes from the previous inservice and preservice inspections of this tube indicates that these indications were present during those periods. These indications have been attributed to mechanical damage which could possibly have occurred during fabrication or installation.

EVALUATION

Requested Change to Technical Specifications

The requested change to the Technical Specifications would, in effect, allow the tube inspections which have already been performed in steam generator 14 to be used as an acceptable alternative to the course of action prescribed by Table 4.4-2 of the Technical Specifications which requires that all tubes in this steam generator be inspected. Based upon our review of the inspection results in steam generator 14, we find that the peripheral zone of the tube bundle which has been subjected to a 100% tube sample inspection adequately bounds the area of concern. Consequently, we find that the proposed change will not have any adverse effect on public health or safety and is therefore acceptable.

During our overall review of the inspection results of all the steam generators we noted the licensee had made two interpretations of the Technical Specifications concerning the inspection of steam generators as follows:

The first instance involved consideration of the full 539 tube initial sample in establishing the results category for the first sample inspection in steam generator 12 rather than the 230 tube sub-sample which was inspected in the cold leg where the indications were found. The second instance involved not performing an additional 6% inspection of steam generator 12 as a consequence of the C-3 finding for steam generator 14. The licensee had previously performed a 12% 2nd sample inspection in steam generator 12 (as a result of its C-2 finding in steam generator 12 during the first sample inspection) with no additional pluggable indications found, and it was their interpretation that this 12% sample fulfilled the Technical Specifications requirement.

We recognize that the Technical Specifications here are not sufficiently clear and are subject to interpretation. However, we believe a strict interpretation would require additional inspections of tubes of steam generator 12 inboard of the peripheral region which was inspected in steam generator 12.

We discussed with the licensee and Westinghouse any possible safety concerns which may exist if defects of the type identified in this inspection are present which might be present in other steam generator tubes not inspected. Based upon operating experience and previous examinations of pulled tube specimens from Prairie Island Unit 2, Westinghouse believes that 100% through-wall penetration would be expected to occur only over a local area of the tube surface which would result in leakage, but

which would not cause a gross tube rupture. In addition, all the defects identified occur entirely within the 3/4" thickness of the tube support plates. Even in the unlikely event that the tube were to rupture over this entire 3/4 inch distance, radial constraint provided by the tube support plate would act to restrain the severity of the rupture (in terms of the size of the fish mouth opening) and thus substantly limit the resulting leakage. Thus, a tube failure at the support plate locations would be substantially less severe (in terms of leakage) than the large tube ruptures which occurred at Prairie Island 1 and Ginna 1 which occurred away from the tube supports and involved ruptures over a 1-1/2 and 4 inch length respectively.

Based on the above, we do not believe that operation for the planned period of seven months prior to performing the next steam generator inspection represents any undue risk to public health or safety. The licensee has agreed to document the results of its assessment of the safety significance of any undetected flaws at the support plate locations. In addition, the licensee has agreed to submit its next inspection program for staff review at least one month prior to the planned shutdown date. Finally, the staff will work with the licensee to further revise the Technical Specifications so as to extend current requirements to include tube inspections on the cold leg side, and to clarify the amount of inspections to be performed in the other steam generators when one or more steam generators are determined to be in Category C-3.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) 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.

Date: May 13, 1982

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272
PUBLIC SERVICE ELECTRIC AND GAS COMPANY,
PHILADELPHIA ELECTRIC COMPANY,
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 43 to Facility Operating License No. DPR-70, issued to Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees), which revised Technical Specifications for operation of the Salem Nuclear Generating Station, Unit No. 1 (the facility) located in Salem County, New Jersey. The amendment is effective as of the date of issuance.

The amendment modifies the Technical Specifications to provide an alternative sampling method for steam generator tube inspections during the refueling outage for Cycle 4.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated February 5, 1982, as supplemented March 5, 1982, (2) Amendment No. 43 to License No. DPR-70, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this 13th day of May, 1982.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

1975 State of the Union address. Support for nuclear energy has dropped below a majority only once -- in April, 1976 -- in the history of the Harris Survey.

The public is clearly choosing up sides on the nuclear issue, more so than in the past. Only 11% of Americans are "not sure" about nuclear power development today, compared to 17% in 1976 and 18% in 1975. Thus, fewer people are undecided about nuclear power than at any time in past surveys.