

Public Service
Electric and Gas
Company

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Vice President and Chief Nuclear Officer

February 9, 1989

NLR-N88206

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

LICENSE AMENDMENT REQUEST
TECHNICAL SPECIFICATION TABLE 4.4-2
SALEM GENERATING STATION
UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272

Public Service Electric and Gas Company (PSE&G) hereby submits a request to amend Appendix A of Facility Operating License No. DPR-70 in accordance with 10 CFR 50.90. This request for amendment provides for an alternate steam generator tube sampling method when the number of degraded or defective tubes detected requires an additional inspection sample and the initial inspection results indicate the degradation to be confined to a specific area of the tube sheet array or portion of the tube.

It has been determined that the proposed amendment does not involve a significant hazards consideration pursuant to 10 CFR 50.92. A description of the amendment request and the basis for a no significant hazards consideration determination is provided in Enclosure 1. Enclosure 2 provides the requested revisions of the Salem Unit 1 Technical Specifications.

The proposed change contained in this amendment request represents an acceptable alternative to the course of action prescribed by Table 4.4-2 of the Salem Unit 1 Technical Specifications. The inspection methods used and plant operating precautions to be taken are identical to those taken for any steam generator tube inspection activity. In addition, the tube failure phenomenon which has prompted this amendment request has similarly occurred at Salem Unit 2, Zion, North Anna, Kewaunee, Trojan, Sequoyah and other plants which provides validity for the proposed alternate sample method.

On October 10, 1988, PSE&G requested a similar license change for Salem Unit 2 on an emergency basis after the discovery of a large number of defective Row 1 tubes on the No. 22 and No. 24 steam

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generators. The Commission concurred with the amendment request and granted Amendment No. 63 to Facility Operating License No. DPR-75 on November 1, 1988. In order to preclude the need for another emergency license amendment request, PSE&G is herein requesting a similar license change for Salem Unit 1 in the event that future eddy current inspection results are indicative of Row 1 or Row 2 U-bend cracking. PSE&G therefore requests approval of this license amendment request prior to the Salem Unit 1 Eighth Refueling Outage, tentatively scheduled to begin on April 15, 1989.

In accordance with 10 CFR 50.91(b)(1), a copy of this amendment request has been sent to the State of New Jersey.

Pursuant to 10 CFR 50.4(b)(2)(ii), this submittal includes one (1) signed original and thirty-seven (37) copies. Should you have any questions regarding this submittal please do not hesitate to contact us.

Sincerely,



Enclosures

C Mr. J. C. Stone
Licensing Project Manager

Ms. K. Halvey Gibson
Senior Resident Inspector

Mr. W. T. Russell, Administrator
Region I

Ms. J. Moon, Interim Chief
New Jersey Department of Environmental Protection
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CN 415
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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

Steven E. Miltenberger, being duly sworn according to law deposes and says:

I am Vice President and Chief Nuclear Officer of Public Service Electric and Gas Company, and as such, I find the matters set forth in our letter dated February 9, 1989 , concerning the Salem Generating Station, Unit No. 1, are true to the best of my knowledge, information and belief.

Steven E. Miltenberger

Subscribed and Sworn to before me
this 9th day of February, 1988

Eileen M. Ochs

Notary Public of New Jersey

EILEEN M. OCHS
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires July 16, 1992

My Commission expires on _____

ENCLOSURE 1

REQUEST FOR AMENDMENT
SALEM GENERATING STATION
UNIT NO. 1
FACILITY OPERATING LICENSE DPR-70
DOCKET NO. 50-272

LCR 89-01

Description of Change

The following statements shall be included in Salem Unit 1 Technical Specification 4.4:

"The following alternate action may be taken in place of that required by Technical Specification Table 4.4-2 when the results of the initial sample requires that an additional sample or samples must be inspected and the condition for which the added inspection is required is limited to Row 1 and/or Row 2 tubes. When examination results fall into a C-2 or C-3 Supplemental Sample Category, pursuant to Technical Specification Table 4.4-2 as a result of Row 1 and/or Row 2 U-bend defective or degraded tubes, additional samples may be limited to Rows 1 and Row 2. The results of the examination of the Row 1 and Row 2 tubes will be exempt from the additional sampling requirements of Technical Specification Table 4.4-2."

Reason for Change

The requested change involves relief from the supplemental tube sample inspection requirements in Table 4.4-2 of the Salem Unit 1 Technical Specifications. The change would allow the use of an alternate steam generator inspection sampling method when the number of degraded or defective tubes requires an additional inspection sample and the initial inspection results indicate the degradation to be confined to a specific area of the tube sheet array or portion of the tube. This amendment request has been prompted by licensing actions taken following steam generator tube eddy current inspections performed during the recent Salem Unit 2 Fourth Refueling Outage in October 1988.

Eddy current examinations were performed on the No. 22 and No. 24 Steam Generators during the Salem Unit 2 Fourth Refueling Outage. The number of tubes to be inspected in the first sample were calculated in accordance with the formula in Technical Specification Table 4.4-2 and consisted of 204 tubes in No. 22 Steam Generator and 204 tubes in No. 24 Steam Generator. An additional 609 tubes were examined in No. 22 Steam Generator for conditions related to the 1987 North Anna Unit 1 steam generator tube rupture incident, as well as other areas of the steam generator where previous history indicated that examinations should be performed.

During the prior Salem Unit 2 operating cycle, primary to secondary system leakage had been detected in both the No. 22 and No. 24 Steam Generators. This leakage was monitored until plant shutdown for the Fourth Refueling Outage. Just prior to shutdown, the primary to secondary leakage measured 4 to 17 gallons per day for No. 22 Steam Generator and 1 to 4 gallons per day for No. 24 Steam Generator.

The leaking steam generator tubes were confirmed during the refueling outage by eddy current examination to be in Row 1. The results of the eddy current examination of the first sample on No. 24 Steam Generator revealed 45 defective tubes, all in Row 1. The results of the eddy current examination of No. 22 Steam Generator revealed 46 defective tubes, all in Row 1. In addition, the eddy current inspection for North Anna considerations revealed no defective or further degraded tubes [No. 24 steam generator had already been evaluated for the North Anna considerations using previous eddy current data. This evaluation resulted in two tubes (R9,C60 and R10,C60) which were plugged during the Salem Unit 2 Fourth Refueling Outage in order to preclude conditions similar to those required to produce a tube failure such as that which occurred at North Anna Unit 1. However, the tube plugging was performed due to the North Anna considerations and not due to an excessive level of tube wall degradation.]

The results of the eddy current examinations of the Row 1 tubes of No. 22 and No. 24 Steam Generators placed both generators in a C-3 examination sample category pursuant to Technical Specification Table 4.4-2. Adoption of the C-3 sampling scheme in this instance would have required a total inspection of the No. 22 and No. 24 Steam Generators and a 4S sample (813 tubes) for each of the No. 21 and No. 23 Steam Generators (assuming no other defects were discovered on No. 21 and No. 23 Steam Generators).

PSE&G felt at that time that adoption of this supplemental sampling scheme was unnecessary and not technically justifiable considering the nature of current examination results. On October 10, 1988, PSE&G submitted an emergency license change request for Salem Unit 2 to allow the adoption of an alternate steam generator tube eddy current inspection sampling method since the discovered defects were confined to a limited region (Row 1) and were indicative of a known problem.

The tube degradation identified on the No. 22 and No. 24 Steam Generators was indicative of a known problem with Westinghouse Series 51 Steam Generators, i.e., defects in the tangential region of the U-bend of Row 1 tubes. Westinghouse advised PSE&G that the defects identified in the first sample eddy current examination results of the No. 22 and No. 24 Steam Generators were similar to those discovered in Row 1 examinations at Zion, North Anna, Kewaunee, Trojan, Sequoyah, and other plants.

The failure mechanism was described by Westinghouse as Primary Water Stress Corrosion Cracking (PWSCC). PWSCC in "low" row U-bends has been most prevalent in Westinghouse Series 51 steam generators and is concentrated in Row 1, occasionally showing up in Row 2. Salem Unit 2 experienced two (2) leaking tubes in November 1987 with this phenomenon. Prior to this date, neither Salem Unit 1 nor Salem Unit 2 had shown any indications of this phenomenon. Westinghouse has informed PSE&G that "low" row U-bend PWSCC is considered a high risk mechanism in the context of growth rate. This is substantiated by the fact that once the phenomenon was detected in November 1987 on Salem Unit 2 (with the two leaking tubes in No. 24 steam generator), the number of defective tubes expanded to 45 by October 1988.

Since the discovered defects were confined to a limited region and were indicative of an established phenomenon related to Row 1 tubes of Westinghouse Series 51 steam generators, inspection of additional tubes outside the area of interest would not have been pertinent. If performed as currently required by the Technical Specifications, additional examination would have been required in areas of the steam generators that have historically been essentially clean of defective and degraded tubes. The additional outage time required to perform the additional eddy current examinations indicated by Technical Specification Table 4.4-2 would not appear to be justified in terms of significant information provided and any increase in the safety realized.

The NRC Staff concurred with the amendment request and granted Amendment 63 to Facility Operating License DPR-75 on November 1, 1988.

The technical justification for the approved Salem Unit 2 license amendment also applies to Salem Unit 1. The Salem Unit 1 Steam Generators have been in operation since 1976, five years longer than those of Salem Unit 2. The prior history of operation of the Salem Unit 1 steam generators has shown an excellent record of performance with minimal tube degradation. This performance record can be attributed to an effective all-volatile-treatment (AVT) program of secondary water as well as other operation and maintenance program enhancements. The history of tube degradation in the Salem Unit 1 steam generators, as in those of Salem Unit 2 prior to the Fourth Refueling Outage, has consisted of relatively few defective or degraded tubes with no obvious inservice corrosion related denting. A summary of indications categorized by the attributable generic cause is shown in the attached table for the Salem Unit 1 steam generators.

PSE&G believes that the proposed alternative steam generator tube inspection sampling method is technically relevant and poses no threat to safety. This has been substantiated by NRC approval of an almost identical license change request for Salem Unit 2

during the Fourth Refueling Outage. This license change is being requested at this time for Salem Unit 1 so as to preclude the need for an emergency license change request during a subsequent Salem Unit 1 outage.

Significant Hazards Consideration Analysis

The standards used to arrive at a determination that a request for amendment involves no significant hazards consideration are included in the Commission's regulations, 10CFR50.92. These regulations state that no significant hazards considerations are involved if the operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed as follows:

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed inspections are an acceptable alternative to the course of action prescribed by Table 4.4-2 of the Technical Specifications in that they are concentrated upon a more strategic area of the steam generator based on initial eddy current examination results. The inspection method used for the proposed sampling scheme is identical to that currently employed. Accordingly, there would be no change in the probability or consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any previously evaluated.

The inspection methods used for the proposed sampling scheme are identical to those used at present. Plant operating precautions are the same as those taken for any steam generator tube eddy current inspection activity. No new or different kind of accident from any accident previously evaluated can be postulated.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

Again, inspection methods used and plant operating precautions taken are identical to those taken for any steam generator tube eddy current inspection activity. Although the alternate sampling method would involve the inspection of fewer tubes than that required by Technical Specification Table 4.4-2, the Table 4.4-2 sampling scheme is based on a random failure rate and not on tube defects which are localized as a result of a prescribed failure mechanism. In this situation, the Table 4.4-2 additional sampling scheme does not appear to be technically justified in terms of providing pertinent information or an increase in safety. Thus, no margin of safety is affected by the proposed change.

SALEM UNIT 1
SUMMARY OF EDDY CURRENT INDICATIONS
CATEGORIZED BY GENERIC CAUSE

<u>Category</u>	<u>No. 11 Steam Generator</u>	<u>No. 12 Steam Generator</u>	<u>No. 13 Steam Generator</u>	<u>No. 14 Steam Generator</u>
Tube Support Plate Indications	Four (4) tubes plugged three (3) tubes with Indications	Three (3) tubes plugged Five (5) tubes with Indications	Five (5) tubes plugged Fifteen (15) tubes with Indications	Seventeen (17) tubes plugged Twenty-nine (29) tubes with Indications
Anti Vibration Bar Abrasion	No indications	One (1) tube plugged Eleven (11) tubes with Indications	One (1) tube with Indications	Four (4) tubes with indications Two (2) tubes plugged
Tube Lane Blocking Device Damage	10 tubes plugged	10 tubes plugged	10 tubes plugged	10 tubes plugged
Foreign Object Damage	Eight (8) tubes with Indications	One (1) tube plugged Nine (9) tubes with Indications	Five (5) tubes with Indications	Six (6) tubes with indications
Row 1 Tangent Cracking	No indications	No indications	One (1) tube plugged	No indications
North Anna Considerations	No action required	No action required	One (1) tube plugged	No action required