Public Service
Electric and Gas
Company

Stanley LaBruna

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

Gentlemen:

TECHNICAL SPECIFICATION 6.9.1.5 ANNUAL REPORTS
SALEM AND HOPE CREEK GENERATING STATIONS
DOCKET NOS. 50-272, 50-311 AND 50-354

Public Service Electric and Gas Company (PSE&G) hereby submits the enclosed Annual Reports for Salem and Hope Creek Generating Stations, in accordance with Technical Specification 6.9.1.5.a and 6.9.1.5.b of Appendix A to Facility Operating License Nos. DPR-70, DPR-75, and NPF-57.

Pursuant to Technical Specification 6.9.1.5.a, Enclosures 1, 2, and 3 are submitted for Salem Unit 1, Salem Unit 2, and Hope Creek Unit 1, respectively. These enclosures contain tabulations on an annual basis of the number of station, utility and other personnel receiving exposures greater than 100 mrem/year and their associated man rem exposures according to work and job function for each unit. These tabulations are intended to supplement the requirements of 10CFR20, Section 20.407. Pursuant to Technical Specification 6.9.1.5.b, Enclosure 4 is submitted for Salem Unit Nos. 1 and 2.

The Annual Report for Challenges to Main Steam Line Safety/Relief Valves for the Hope Creek Generating Station Required by Technical Specification 6.9.1.5.b of Appendix A to Facility Operating License No. NPF-57 is being transmitted separately.

Should you have any questions or comments regarding this submittal, please contact us.

Sincerely,

Enclosures

IE56
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Mr. T. P. Johnson (S09)
USNRC Senior Resident Inspector

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NJ Department of Environmental Protection
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ENCLOSURE 1

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

SALEM UNIT 1
STANDARD FORMAT FOR REPORTING
NUMBER OF PERSONNEL AND
PERSON-REM WORK AND JOB FUNCTION

DATE: 02/25/92
REGULATORY GUIDE
1.16
REPORT PERIOD
FROM: 01/01/91
TO: 12/31/91

WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Reactor Operations and Surveillance						
Maintenance	6	0	5	3555	3	3115
Operating	0	0	0	74	0	9
Health Physics	5	0	0	1913	0	232
Chemistry	0	0	0	0	0	0
Supervisory	0	1	0	0	194	9
Engineering	0	0	0	268	39	24
I&C	1	0	0	732	0	206
Security	0	0	0	1	0	0
Routine Maintenance						
Maintenance	7	1	30	3246	198	12141
Operating	12	0	5	3388	0	1147
Health Physics	33	0	25	11990	55	9073
Chemistry	0	0	0	386	6	7
Supervisory	0	1	0	28	209	14
Engineering	2	0	0	897	164	45
I&C	0	0	0	65	0	236
Security	0	0	0	2	0	224
Inservice Inspection						
Maintenance	0	0	46	93	9	14910
Operating	0	0	0	2	0	0
Health Physics	0	0	0	57	0	82
Chemistry	0	0	0	0	0	0
Supervisory	0	0	0	0	3	0
Engineering	0	0	0	15	1	25
I&C	0	0	0	0	0	0
Security	0	0	0	0	0	0
Special Maintenance						
Maintenance	0	0	0	391	13	353
Operating	0	0	0	49	0	6
Health Physics	0	0	0	173	0	50
Chemistry	0	0	0	2	0	0
Supervisory	0	0	0	19	15	2
Engineering	0	0	0	72	5	0
I&C	0	0	0	32	0	0
Security	0	0	0	3	0	165

ENCLOSURE 1 (CONT'D)

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

SALEM UNIT 1
STANDARD FORMAT FOR REPORTING
NUMBER OF PERSONNEL AND
PERSON-REM WORK AND JOB FUNCTION

DATE: 02/25/92
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WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Waste Processing						
Maintenance	0	0	0	45	0	40
Operating	0	0	0	0	0	0
Health Physics	0	0	0	399	0	92
Chemistry	0	0	0	0	0	0
Supervisory	0	0	0	1	6	0
Engineering	0	0	0	3	0	0
I&C	0	0	0	0	0	0
Security	0	0	0	0	0	12
Refueling						
Maintenance	63	2	333	20962	360	214685
Operating	7	0	0	1603	0	12
Health Physics	12	0	26	6749	0	15751
Chemistry	0	0	0	118	2	2
Supervisory	1	3	0	121	1325	272
Engineering	6	0	0	1847	304	249
I&C	0	0	8	410	0	1593
Security	0	0	0	9	0	369
Total						
Maintenance	76	3	414	28292	583	245244
Operating	19	0	5	5116	0	1174
Health Physics	50	0	51	21281	55	25280
Chemistry	0	0	0	506	8	9
Supervisory	1	5	0	169	1752	297
Engineering	8	0	0	3102	513	343
I&C	1	0	8	1239	0	2035
Security	0	0	0	15	0	746
Grand Total:	155	8	478	59720	2911	275128

Personnel Exposure and Monitoring Report for NRC Docket Number: 50-272
Exposure year: 1991

Licensee: Public Service Electric and Gas Company Date: 02/25/92

Total Exposure for Salem Unit 1 by TLD during 1991 was 337.759 person-rem.

ENCLOSURE 2

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

SALEM UNIT 2
STANDARD FORMAT FOR REPORTING
NUMBER OF PERSONNEL AND
PERSON-REM WORK AND JOB FUNCTION

DATE: 02/25/92
REGULATORY GUIDE
1.16
REPORT PERIOD
FROM: 01/01/91
TO: 12/31/91

WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Reactor Operations and Surveillance						
Maintenance	5	0	0	2042	2	762
Operating	0	0	0	194	0	60
Health Physics	1	0	0	1050	0	79
Chemistry	0	0	0	0	0	0
Supervisory	0	0	0	0	27	18
Engineering	0	0	0	147	22	15
I&C	0	0	0	2	0	189
Security	0	0	0	0	0	0
Routine Maintenance						
Maintenance	0	0	6	2954	138	4937
Operating	0	0	1	1415	0	585
Health Physics	14	0	5	3821	55	2515
Chemistry	0	0	0	355	4	7
Supervisory	0	0	0	19	103	17
Engineering	0	0	0	566	21	83
I&C	0	0	0	70	1	191
Security	0	0	0	2	0	224
Inservice Inspection						
Maintenance	0	0	42	334	0	24615
Operating	1	0	0	159	0	1
Health Physics	3	0	12	866	0	3704
Chemistry	0	0	0	4	0	0
Supervisory	0	0	0	0	1	0
Engineering	2	0	0	275	0	0
I&C	0	0	0	0	0	0
Security	0	0	0	0	0	0
Special Maintenance						
Maintenance	4	0	1	1489	44	807
Operating	0	0	0	22	0	6
Health Physics	1	0	0	440	0	64
Chemistry	0	0	0	6	0	0
Supervisory	0	0	0	19	37	2
Engineering	0	0	0	75	45	0
I&C	0	0	0	32	0	37
Security	0	0	0	3	0	165

ENCLOSURE 2 (CONT'D)

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

SALEM UNIT 2
STANDARD FORMAT FOR REPORTING
NUMBER OF PERSONNEL AND
PERSON-REM WORK AND JOB FUNCTION

DATE: 02/25/92
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REPORT PERIOD
FROM: 01/01/91
TO: 12/31/91

WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Waste						
Maintenance	0	0	0	40	0	0
Operating	0	0	0	0	0	0
Health Physics	0	0	0	266	0	29
Chemistry	0	0	0	0	0	0
Supervisory	0	0	0	1	6	0
Engineering	0	0	0	3	0	0
I&C	0	0	0	0	0	0
Security	0	0	0	0	0	0
Refueling						
Maintenance	18	0	130	6649	142	46482
Operating	0	0	0	998	0	124
Health Physics	11	0	14	3100	0	3821
Chemistry	0	0	0	15	0	0
Supervisory	0	1	0	94	362	89
Engineering	1	0	1	732	65	141
I&C	0	0	5	94	0	1094
Security	0	0	0	4	0	173
Total						
Maintenance	27	0	179	13508	326	77603
Operating	1	0	1	2788	0	776
Health Physics	30	0	31	9543	55	10212
Chemistry	0	0	0	380	4	7
Supervisory	0	1	0	133	536	126
Engineering	3	0	1	1798	153	239
I&C	0	0	5	198	1	1511
Security	0	0	0	9	0	562
Grand Total	61	1	217	28357	1075	91036

Personnel Exposure and Monitoring Report for NRC Docket Number: 50-311
Exposure Year: 1991

Licensee: Public Service Electric and Gas Company Date: 02/25/92

Total exposure for Salem Unit 2 by TLD during 1991 was 120.468 person-rem.

ENCLOSURE 3

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

HOPE CREEK
STANDARD FORMAT FOR REPORTING
NUMBER OF PERSONNEL AND
PERSON-REM WORK AND JOB FUNCTION

DATE: 02/25/92
REGULATORY GUIDE
1.16
REPORT PERIOD
FROM: 01/01/91
TO: 12/31/91

WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Reactor Operations and Surveillance						
Maintenance	5	1	4	2270	180	1774
Operating	7	0	2	2020	47	459
Health Physics	1	1	1	1521	293	651
Chemistry	5	1	0	1136	217	0
Supervisory	0	0	0	30	3	26
Engineering	1	0	0	446	21	9
I&C	0	0	0	18	0	2
Security	0	0	0	5	0	325
Routine Maintenance						
Maintenance	0	0	6	272	1	2933
Operating	0	0	0	34	0	0
Health Physics	0	0	0	0	0	84
Chemistry	0	0	0	0	0	0
Supervisory	0	0	0	0	2	0
Engineering	0	0	0	61	34	49
I&C	0	0	0	1271	0	3
Security	0	0	0	10	0	0
Inservice Inspection						
Maintenance	1	0	136	335	0	63532
Operating	0	0	0	0	0	0
Health Physics	0	0	0	47	0	116
Chemistry	1	0	0	284	0	0
Supervisory	0	0	0	49	135	0
Engineering	1	1	0	327	749	28
I&C	0	0	2	0	0	659
Security	0	0	0	0	0	68
Special Maintenance						
Maintenance	53	2	56	18780	418	21049
Operating	41	1	7	12969	208	2840
Health Physics	35	1	19	16731	191	6521
Chemistry	3	1	0	661	134	0
Supervisory	0	0	1	179	65	229
Engineering	4	5	2	1683	791	421
I&C	32	0	0	9615	0	35
Security	0	0	1	14	0	592

ENCLOSURE 3 (CONT'D)

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY
HANCOCK'S BRIDGE, NJ 08038

HOPE CREEK
STANDARD FORMAT FOR REPORTING
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DATE: 02/25/92
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WORK AND JOB FUNCTION (PERSONNEL GROUPING)	NUMBER OF PERSONNEL (>100 MREM) STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS	TOTAL PERSON-MREM STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS & OTHERS
Waste Processing						
Maintenance	1	0	3	344	0	2652
Operating	0	0	0	139	0	24
Health Physics	8	0	1	3916	4	162
Chemistry	0	0	0	1	0	0
Supervisory	0	0	0	4	0	0
Engineering	0	0	0	240	0	0
I&C	1	0	0	158	0	0
Security	0	0	0	0	0	7
Refueling						
Maintenance	58	2	312	20234	355	125390
Operating	21	1	7	5393	205	1993
Health Physics	20	0	48	7947	0	13952
Chemistry	1	0	0	319	8	0
Supervisory	0	1	2	260	283	396
Engineering	2	1	2	849	217	1760
I&C	31	0	0	8941	0	60
Security	0	0	0	146	0	92
Total						
Maintenance	118	5	517	42235	954	217330
Operating	69	2	16	20555	460	5316
Health Physics	64	2	69	30162	488	21486
Chemistry	10	2	0	2401	359	0
Supervisory	0	1	3	522	488	651
Engineering	8	7	4	3606	1812	2267
I&C	64	0	2	20003	0	759
Security	0	0	1	175	0	934
Grand Total:	333	19	612	119659	4561	248743

Personnel Exposure and Monitoring Report for NRC Docket Number: 50-354
Exposure Year: 1991

Licensee: Public Service Electric and Gas Company Date: 02/25/92

Total exposure for Hope Creek by TLD during 1991 was 372.963 person-rem.

SALEM UNIT 1 STEAM GENERATORS

During Salem Unit 1 9th refueling outage examinations on number 11, 12, 13 and 14 Steam Generators were performed by the Westinghouse (NSD), coordinated by the ISI Group.

The Eddy Current examination scope is detailed below:

A. One hundred (100) percent of the tubes in each Steam Generator were examined.

- Three (3) percent of the tubes (103) in 11, 12, 13 and 14 Steam Generators were selected to satisfy Technical Specification requirements.

- The remaining ninety-seven (97) percent of tubes in 11, 12, 13 and 14 Steam Generators were done in addition to the required Tech. Spec. exam.

B. Twenty (20) percent of the tubes in number 11, 12, 13 and 14 Steam Generators were examined using a rotating pancake coil (RPC) due to industry concerns from tube expansion by the WEXTEX method. This sample was concentrated in the kidney region because of the high probability of indications due to sludge buildup.

C. Eddy Current Exams

	(% of Tubes)			
	11SG	12SG	13SG	14SG
Full length Bobbin Coil(1)	100%	100%	100%	100%
Rotating Pancake Coil (2)	20%	20%	20%	20%

(1) From tube sheet, hot leg side, to tube sheet cold leg side.

(2) Performed in the Steam generator Kidney Region.

Eddy Current Results

A. The Technical Specification sample in number twelve (12) Steam Generator revealed an indication in one tube which exceeded the Tech. Spec. plugging limit (40%). Therefore the exam was expanded to a 2S sample (206 tubes) in this Generator. This exam revealed an additional indication in one tube which exceeded the Tech. Spec. plugging limit (40%). The sample was then expanded to 4S sample (412 tubes). The results of the 4S sample showed no additional indications that required plugging.

B. The Technical Specification samples in number 11, 13 and 14 Steam Generators revealed no indications which exceeded the 40% plugging limit.

C. Rotating Pancake Coil examination results revealed a single circumferential indication in one tube in 14 Steam Generator, row 14, column 67. The rotating pancake coil exam was expanded to include the immediate adjacent tubes. No additional indications were noted. No circumferential indications were noted in number 11, 12 and 13 Steam Generators.

NUMBER OF TUBES WITH INDICATIONS IDENTIFIED DURING 1R9 OUTAGE
(Including Tech. Spec. sample)

	<20%	20 to 39% (wall penetrations)	≥40%
11 Steam Generator (1)	9	9	1
12 Steam Generator	4	40	8
13 Steam Generator (2)	8	7	2
14 Steam Generator (3)	14	18	3

(1) In addition, row 31 column 79 had restricted access to a .680 probe. Using a .650 probe revealed a 34% cold leg indication. This tube was preventively plugged.

(1) Bobbin inspection of row 7 column 3 and row 12 column 3 had revealed distorted indications. Subsequent RPC inspection revealed single axial indications of indeterminate depth in these two tubes. In addition, row 33 column 78 had restricted access to a .680 probe. These three tubes were preventively plugged.

(2) Bobbin inspection of row 6 column 67 revealed distorted indications. Subsequent RPC inspection revealed single axial indication of indeterminate depth. In addition, row 18 column 11 had restricted access to a .680 probe and row 14 column 67 had a single circumferential indication(see C. above) These three tubes were preventively plugged.

All tubes with an indication of ≥40% degradation of nominal tube thickness were plugged for Tech. Specs. and all tubes with an indication of 35% to 39% degradation of nominal tube thickness and restricted access and were preventively plugged.

U-bend Heat Treatment

A. U-bend Heat Treatment was performed on all of Row Two Tubes in the 11, 12, 13 and 14 Steam generators. Eddy current was performed post U-bend heat treatment to verify the proper heat affected zone was achieved.

In 12 S/G row 2 column 63 was missed during the U-bend heat treatment process and was mechanically plugged as preventive maintenance.

Current status of the 11, 12, 13 and 14 Steam Generators.

A. At this time the total number of tubes plugged in the Salem Unit 1 Steam generators are as follows:

Generator #	11	12	13	14
Tubes plugged	104	120	109	141

In 11, 12, 13 and 14 Steam generators, the first five (5) and the last (5) tubes in row 1 were initially plugged because of a generic wearing problem on the tubes due to the tube lane blocking device vibrating. The remaining tubes in row 1 were plugged because there was evidence of the onset of stress corrosion cracking in the U-bend area.

SALEM UNIT 2 STEAM GENERATORS

During Salem Unit 2 sixth refueling outage examinations on number 21 and 23 Steam Generator were performed by the Westinghouse NSD, and coordinated by the ISI Group. The Eddy Current examination scope is defined below:

21 S/G - Inspections were performed on 52% of the tubes (1,739) with bobbin coil. The sample included 204 tubes randomly selected to satisfy technical specification requirements and tubes with indications noted during previous refueling outages.

- In addition, the inspection included 50% of the tubes (1,694) with a Rotary pancake Coil (RPC). These exams address the concern of Expansion Zone Pure Water Stress Corrosion Cracking at the hot leg tube sheet for steam generators manufactured using explosive tube expansion (WEXTEX) techniques.

23 S/G - Inspection performed on 55% of the tubes (1,851) with bobbin coil. Sample included 204 tubes randomly selected to satisfy technical specification requirements and tubes with indications noted during previous refueling outages.

- In addition inspection of the 50% of the tubes (1,694) with RPC to address the concern of Expansion Zone Pure Water Stress Corrosion Cracking at the hot leg tube sheet for steam generators manufactured using explosive tube expansion (WEXTEX) techniques.

Eddy Current Results

21 S/G - The 204 randomly selected tubes to satisfy Technical Specification revealed no indications equal to or exceeding the 40% plugging limit (defective tubes) and satisfied the less than 5% of the inspected tubes were degraded thus a scope expansion was not required.

- 6 tubes with indications from previous refueling outages were plugged due to indication growth exceeding technical specification plugging limit or preventively due to tube degradation being in the 35 to 39% range.

- 1 tube in the non technical specification sample was preventively plugged due to tube degradation in the 35 to 39% range.

- 1 tube was plugged due to a single axial indication noted during RPC inspection which was estimated to exceed the 40% plugging limit.

23 S/G - All inspection results were satisfactory thus there were no tubes plugged and no scope expansion required as a result of eddy current inspection performed.

Additional Work Performed 2R6

In response to NRC Bulletin No. 88-02 "Rapidly Propagating Fatigue Cracks in Steam generator Tubes" and as a consequence of the steam generator tube rupture event which occurred at Virginia Power's North Anna Unit 1 plant, an engineering evaluation was completed by Westinghouse for Public Service Electric and gas Co. to identify potential tubes susceptible to vibration induced fatigue. Eight tubes were identified as being susceptible to the occurrence of fatigue cracking. To preclude this occurrence, Public Service Electric and Gas decided to remove eight tubes from service with installation of a cable type tube damper, a solid mechanical plug in the hot leg tube ends and a sentinel plug in the cold leg tube end. The intent of the insertion of the cable-type damper into a potentially susceptible tube is to modify the tube U-bend system by changing its damping characteristics thus decreasing the resultant U-bend displacement and hence the susceptibility to tube fatigue cracking. The use of a sentinel plug on the cold leg assures for early detection of any primary to secondary leakage. Any leakage detected would be small, controlled amount less than the Technical Specification limit for primary to secondary leakage.

The work performed during 2R6 to address this issue is shown below:

21 S/G - 2 tubes - R9C59 & R9C60
22 S/G - 5 tubes - R8C61, R10C46, R10C50, R11C16 & R11C17
23 S/G - 1 tube - R8C59

NUMBER OF TUBES WITH INDICATIONS IDENTIFIED DURING 2R6 OUTAGE
(Including Tech. Spec. sample)

	<20%	20 to 39% (wall penetrations)	≥40%
21 Steam Generator	16	40	1
23 Steam Generator	36	26	0