



Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038

Nuclear Department

December 19, 1984

U. S. Nuclear Regulatory Commission
Region 1
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. Thomas T. Martin, Director
Division of Engineering and Technical Programs

Gentlemen:

NRC INSPECTION 50-272/84-35
SALEM NUCLEAR GENERATING STATION
UNIT NO. 1
DOCKET/LICENSE: 50-272/DPR-70

The referenced inspection, conducted on September 18 and 24, 1984, identified one violation, which involved inadequate procedures for monitoring upper arm exposures in non-uniform radiation fields. The following is Public Service Electric and Gas's response to the Notice of Violation:

ITEM OF VIOLATION:

10 CFR 20.202 "Personnel Monitoring" states, "each licensee shall supply appropriate personnel monitoring equipment to, and shall require the use of such equipment by:
...Each individual who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of twenty-five percent (25%) of the applicable value specified in paragraph (a) of Part 20.101."

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The Energy People

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Contrary to the Above:

As of July 2, 1984, the licensee failed to supply or require the use of personnel monitoring equipment appropriate for monitoring whole body exposure to the upper arms of individuals.

RESPONSE TO THE VIOLATION:

Identification and removal of debris from the Unit 1 Steam Generators were performed under Radiation Exposure Permit (REP) 0375, and prior to July 2, 1984, the workers had dosimeters only on the wrist, chest, and head. As a result of an allegation by one of the workers, it was determined that dosimeters were required on the upper arm as well, and the workers on REP 0375 were issued additional badges on July 2 to monitor whole-body exposure to the upper arms. Because of the potential for unmonitored exposure prior to July 2, a work stoppage was ordered on July 6, until an investigation could be conducted. The results of the investigation are detailed in Lapse of Radiological Control 84-125 and an Incident Report 84-109 (attached).

1. CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED:

Radiation Protection Procedure (RP) 3.021 was revised to clarify the placement of special dosimetry, which will be clearly and consistently indicated on diagrams. This specific incident involving upper-arm exposure in a non-uniform radiation field, the change to RP 3.021, and the guidance provided in IE Information Notices 81-26 and 83-59 were reviewed by all PSE&G and contractor health physics personnel.

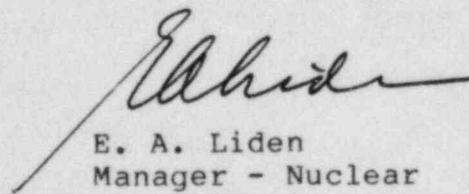
2. CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS:

See paragraph 1 above.

3. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED:

We are now in full compliance.

Very truly yours,



E. A. Liden
Manager - Nuclear
Licensing and Regulation

Mr. Thomas T. Martin

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12/19/84

C Mr. Donald C. Fischer
Licensing Project Manager

Mr. James Linville
Senior Resident Inspector

ATTACHMENT

ADMINISTRATIVE OVER-EXPOSURE OF WESTINGHOUSE WORKERS REP #0375

During this Refueling Outage, all Unit No. 1 Steam Generator Moisture Separators were modified to install additional drains. Following this modification, Westinghouse was contracted to perform an annulus search and retrieve any debris observed. Performance of the search required that a worker insert the optical device through the secondary handhole located just above the tube sheet on each Steam Generator. The worker then extends his arm inside the handhole and manipulates/guides the optical device to the location desired. He then removes his arm and views as much area as possible prior to moving the device to a new location. During this search, a significant amount of debris was observed on the tube sheet. A method of debris removal was developed which utilized the same method to insert a vacuum cleaner hose as was previously used to insert the optical viewing device. Manipulation of the vacuum cleaner hose did require more time with the workers arm inside the handhole. This method of debris removal was not discussed during the Pre Work Alara Review meeting but was discussed during the Subsequent Planning meeting at which radiation protection personnel were in attendance.

During the course of an investigation of an administrative overexposure of E. Burkholder (Westinghouse) concerns were identified regarding the work practices being following by Westinghouse personnel, and about a change of location of dosimeters for those personnel performing that work. The apparent result of relocating the personal dosimeters was an increase in the rate at which personnel were receiving exposure. This raised the question of whether there had been higher exposure to the workers than had previously been recorded. Since, for a majority of the workers, the work practice had not changed significantly, a review of their previous and current exposure was undertaken. (That is they were spending the same amount of time with their arms inside the handhole now as before the relocation of the dosimetry.)

As a result of this review, and after interviewing all available Westinghouse personnel, the following conclusions were made:

1. The workers followed one of two basic work methods regarding the extension of their arms inside the steam generator handhole.
 - A) They worked a majority of the time using only the forearm with occasional extension of the whole arm.
 - B) They worked a majority of the time with the entire arm extended inside the steam generator handhole.

2. For the workers in Category "A", there is no significant difference of wrist to highest of whole body, chest or head ratios after the time of relocating the dosimeters as compared to these same ratios prior to relocation.
3. For workers in Category "B", there was a significant change in the ratio of highest wrist to highest of whole body, chest or head ratio after relocating the dosimeters as compared to before relocation.
4. There were three workers who met Category "B" criteria (see attached worksheet). For these personnel, it will be necessary to adjust the whole body record values to account for the exposure they received to the upper arm prior to relocation of dosimetry.

As a result of this incident, and because there have been several other instances of administrative overexposure to personnel this outage, the following actions shall be taken:

1. A procedural review shall be conducted to determine adequacy of procedures for controlling personnel, and changes to these procedures shall be made as needed.
2. The recent incidents of overexposure will be reviewed with all radiation protection personnel with special emphasis on the urgency of following procedures and being alert for changing conditions.

It is felt that these actions along with those corrective actions of the previously mentioned incidents will be effective in preventing any further instances of personnel overexposures.

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Public Service Electric & Gas
SALEM NUCLEAR GENERATING STATION

REPORT OF LAPSE OF RADIOLOGICAL CONT

LOCATION OF OCCURRENCE U/I Containment REP 0375	DATE 7/6/84	TIME 1400	SEVERITY 1 B	NUMBER LRC 84-12
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PERSONNEL INVOLVED AND DESCRIPTION OF EVENTS

NAME SOCIAL SECURITY NUMBER	TLD SLOT	COMPANY/ORGANIZATION	NAME SOCIAL SECURITY NUMBER	TLD SLOT	COMPANY/ORGANIZATION
Burkholder 199-46-6426	751	Westing House			
Decker 198-52-1345 299-56-7748	615	Westing House			
Chossion 299-56-7748	2782	Westing House			

DESCRIPTION OF EVENTS: Include suspected/probable cause and immediate corrective action

Workers ^{may have} exceeded exposure authorization for previous quarter and current quarter due to dosimetry location not being representative of actual whole body dose.

REPORTED BY <i>JMO</i>	DATE 7/7/84	TIME 1200
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RADIATION PROTECTION DEPARTMENT REVIEW

COMMENTS AND RECOMMENDED PERMANENT CORRECTIVE ACTION

Investigate to determine cause of incident and determine ~~as far as~~ dose workers may have received. Dosimetry was relocated on workers effective 7/2/84, all exposure received prior to this time at Salem should be reviewed.

REVIEWED BY <i>JMO</i>	DATE 7/7/84	TIME 1200
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RESPONSIBLE DEPARTMENT REVIEW

FORWARDED TO <i>O'Connor</i>	DATE 7/7/84	TIME 1200
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NOTE: The responsible Department Head must complete the review of this LRC and return the completed report to the Radiation Protection Department within ten (10) calendar days of the forwarding date of the report.

COMMENTS AND CORRECTIVE ACTION IMPLEMENTED: Include commitment date for long-term corrective action

See Attached

RESPONSE BY <i>JMO</i>	DATE 7/18/84	TIME 0800
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All Exposure Values are in mrem

Name	Date	Wrist	WB	Chest	Head
Decker	6/28	2615	1188	419	464
	7/1	2250	390	375	308
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Dosimetry	7/3	2385	855	873	291
Relocated	7/5	850	487	591	92
Effective					
07/02/84					

Procedure

1. Add chest values of 7/3 and 7/5 and divide by 2 to obtain average Chest = C.
2. Add wrist values of 7/3 and 7/5 and divide by 2 to obtain average wrist = W.
3. Divide W by C to obtain Ratio = R.
4. Divide wrist values of 6/28 and 7/1 by R to obtain new whole body value = WB.
5. Add new WB reading to previous or correct exposure to obtain corrected whole body values.

Results

1.
$$\frac{873 + 591}{2} = C = 732$$
2.
$$\frac{2385 + 850}{2} = W = 1617$$
3.
$$\frac{1617}{732} = R = 2.2$$

4. $\frac{2615}{2.2} = \text{WB} = 1188$ for 6/28: $\frac{2250}{2.2} = \text{WB} = 1022$ for 7/1

5. 2nd Quarter 1156 Arriving Dose	3rd Quarter 1022
<u>1188 Corrected Dose</u>	+873
2344 Total	<u>+591</u>
	2486 mrem Total

All Values Are In mrem

Name	Date	Wrist	WB	Chest	Head
Burkholder	6/28	1845	423	444	449
	7/1	2310	240	252	271
Dosimetry	7/3	1960	484	830	156
Relocated	7/6 *	See Note	900 Mrem		
Effective					
07/02/84					

Procedure

1. Divide wrist by chest to obtain Ratio = R.
2. Divide wrist values of 6/28 and 7/1 by R to obtain new whole body value = WB.
3. Add new WB value to previous or correct values current quarter to obtain corrected whole body values.

Results

1. $\frac{1960}{830} = 2.36$
2. $6/28 \frac{1845}{2.36} = WB = 782$
 $7/1 \frac{2310}{2.36} = WB = 979$
3. $979 + 830 + 900* = 2709*$ mrem third quarter
 1452 arriving dose + 782 corrected doses = 2234 mrem second quarter.

* TLD will not be read until 7/9/84. Dosimeter reading from REP sign in sheet used to calculate current quarter exposure when TLD is read this value will be updated.

All Exposure Values in mrem

Name	Date	Wrist	WB	Chest	Head
Chassion	6/28	770	377	325	362

No entries since relocation of dosimetry.

During the interview the worker stated he also worked with his arm fully extended into hand hole. For this reason the following procedure will be used to correct his second quarter dose.

1. Add the ratios R determined for Decker and Burkholder and divide by 2 to obtain an average worker Ratio = AR.
2. Divide wrist value of 6/28 by AR to obtain new whole body value = WB.
3. Add WB to previous exposures or any exposure received at SNGS during the second quarter to obtain corrected whole body value.

Results

1.
$$\frac{2.36 + 2.2}{2} = 2.28 = \text{AR}$$

2.
$$\frac{770}{2.28} = \text{WB} = 338^*$$

3. *Since this value is less than listed WB value no change to exposure record will be needed.

UPDATE OF ATTACHMENT TO LRC 84-125

TLDs worn by D. Burkholder during his last entry on REP 0275 dated 7/6/84 were processed on 7/9/84 with the following results.

Wrist	WB	Chest	Head
1330	497	657	120

Following the process previously outlined for Decker:

1. Add the chest readings of 7/3 and 7/6 to obtain C.
2. Add the wrist readings of 7/3 and 7/6 to obtain W.
3. Divide W by C to obtain R.
4. Divide wrist values of 6/28 and 7/1 to obtain new whole body values WB.
5. Sum the new WB readings to previous or correct exposure to obtain corrected whole body value.

Results

1.
$$\frac{830 + 657}{2} = 743.5$$
2.
$$\frac{1960 + 1330}{2} = 1645$$
3.
$$\frac{1645}{743.5} = 2.2$$
4.
$$\frac{1845}{2.2} = \text{WB} = 838 \text{ mrem for 6/28, } \frac{2310}{2.2} = 1050 \text{ mrem for 7/1}$$

5. Second quarter exposure = 1452 arriving dose + 838 corrected dose of (7/3) = 2290 mrem.

Third quarter exposure = 1050 corrected dose of (7/1) + 830 (7/3) + 657 (7/6) = 2537 mrem.

INCIDENT REPORT

REPORT #

84-109

REPORT SUBJECT: Violation of AP-24 Exceeding Admin Exposure
Guidelines

1. INITIATION

DATE/TIME ACTION STATEMENT ENTERED _____ A/S # _____

DATE/TIME ACTION STATEMENT TERMINATED _____

UNIT 1 MODE _____ REACTOR POWER LEVEL 0 UNIT LOAD 0

2. DESCRIPTION OF INCIDENT/SEQUENCE OF EVENTS:

Improper Placement of Whole Body Badges on 2 (W) Personnel
Resulting in exceeding Admin Guidelines of Exposure
Remaining (W) Personnel used alternate work method
than the above 2 workers and therefore were
unaffected by failure to move or relocate
dosimetry to correct location on the arm.
10CFR20 LIMITS NOT EXCEEDED, ONLY ADMIN. LIMITS.

REPORTED TO SSS/ES BY J. O'Connor WORK ORDER # _____
(PRINT NAME)NOTIFIED OF INCIDENT: OPS MGR _____ OR _____ SSS/D _____ OR GENERAL
TIME 2000 REPORT SUBMITTED: McHall Senior Supervisor
SENIOR SHIFT SUPERVISOR

3. FOLLOW-UP

MAJOR CAUSE: EQUIPMENT FAILURE _____ PROCEDURE INADEQUACY _____
PERSONNEL ERROR _____ OTHER _____

INCIDENT CLASSIFICATION: NON-REPORTABLE _____ REPORTABLE IAW _____

LER NUMBER _____

4. CORRECTIVE ACTION TAKEN AND/OR JUSTIFICATION FOR NON-REPORTING:

5. REVIEW

OPERATING ENGINEER _____

DATE _____

SQAE _____

DATE _____