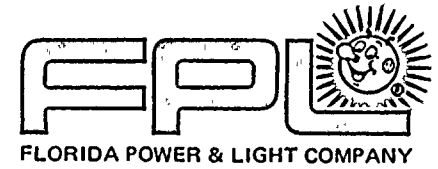


DMB

06 MAY 29 AIO: 24



MAY 27 1986
L-86-219

Dr. J. Nelson Grace
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323

Dear Dr. Grace:

RE: St. Lucie Unit 1
Docket Nos. 50-335
Inspection Report 86-01, EA 86-53

Florida Power & Light Company (FPL) has reviewed the subject inspection report, and a response is attached.

FPL does not concur with all of the findings as stated in the Notice of Violation. We concur that a potential for overexposure did exist. It is our opinion that adequate controls were in place and that a reasonable evaluation was performed under the circumstances present and based on industry practice. Based on this determination it is our opinion that the severity level proposed by the Commission is not warranted. A detailed discussion of the reasons for our determination is provided in the attachments to this letter.

Should you or your staff need any additional information on this important issue, please contact us.

There is no proprietary information in the report.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/SAV/eh

Attachments A&B

cc: Harold F. Reis, Esquire
PNS-LI-86-164

L3:1

8606100292 860527
PDR ADOCK 05000335
Q PDR

IE 01

11

11



11

11



ATTACHMENT A

RE: St. Lucie Unit 1
Docket Nos. 50-335
Inspection Report 86-01, EA 86-53

FINDING

- A. Technical Specification 6.11 requires that procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

Technical Specification 6.8.1a provides that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Appendix "A" of the referenced Regulatory Guide, number 7.e., lists Radiation Protection Procedures as activities to be covered by written procedures. Technical Specification 6.8.2 provides that procedures specified in Technical Specification 6.8.1a and changes thereto shall be reviewed by the Facilities Review Group (FRG) and approved by the Plant Manager prior to implementation and be reviewed periodically as set forth in administrative procedures.

Contrary to the above, during the period November through December 1985, in which the licensee performed sludge lancing of the Unit 1 steam generator, procedures for personnel radiation protection were not prepared which specified the radiation protection requirements for the Unit 1 steam generator sludge lancing. Informal internal memoranda were used in lieu of approved procedures to specify the radiation protection controls for the steam generator work.

RESPONSE

1. FPL does not concur that written radiation protection procedures were not used in performing the sludge lancing project and furthermore, they do comply with the intent of Regulatory Guide 1.33, Revision 2.

Health Physics Procedure #HP-1, Radiation Work Permits, and Administrative Procedure #3300120, St. Lucie Plant ALARA Program were the applicable procedures that were used for the sludge lancing of the steam generators. These procedures were reviewed by the Facility Review Group and approved by the Plant Manager. The informal internal memoranda referred to above was used in addition to and not in lieu of approved procedures. Attachment B provides additional information concerning the procedures described above and the training that was provided prior to the sludge lancing project.

12



ATTACHMENT A (cont.)

2. Although procedures meeting the intent of Regulatory Guide 1.33, Revision 2 were in place prior to the event, we have developed an additional procedure related to Health Physics requirements for all Steam Generator activities for further enhancements of the existing program. This procedure was reviewed and approved by the Facility Review Group and Plant Manager on April 4, 1986.
3. See Item 2 above.
4. Full compliance has been achieved.

FINDING B.1

10 CFR 20.201(b) requires that each licensee make or cause to be made such surveys as may be necessary for the licensee to comply with the regulations in 10 CFR Part 20 and are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

1. Contrary to the above, during the period of November through December 1985, adequate surveys (evaluations) of personnel whole body radiation exposures during the Unit 1 steam generator sludge lancing were not performed. Specifically, worker assigned pocket dosimeters, used by the licensee as whole body dose control devices, were not evaluated periodically as a worker removed his arm from the steam generator handhole prior to permitting him to reinsert his arm so as to facilitate comparisons between predicted and actual exposures. As a result, on December 3, 1985, a worker was found to have exceeded his allowed administrative exposure limit of 565 millirem by 234 millirem after having made four arm entries into the steam generator handhole.

RESPONSE

1. FPL concurs with this finding, however only in part, because an administrative exposure guideline was exceeded. FPL does believe that use of stay times is an effective method of controlling exposures. Surveys were completed, stay times were calculated based on those surveys and these stay times were not exceeded.
2. Corrective actions taken included the following:
 - a. Immediately suspending all sludge lancing operations pending results of an investigation into the exposure.
 - b. The Thermoluminescent Dosimeter's (TLD's) of all other personnel involved were read and none of these personnel received exposures in excess of regulatory limits.
 - c. Evaluations of TLD's and pocket dosimeters were conducted. This evaluation revealed that the pocket dosimeters under responded by 26 to 40 percent when placed in the sludge lancing geometry (pocket dosimeter parallel to the hand hole).

ATTACHMENT A (cont.)

- d. Based on the above mentioned evaluations, pocket dosimeters were read on a more frequent basis and TLD's were pulled and read out upon reaching 1500 mR for the quarter as measured by pocket dosimeter.
 - e. A holder for the TLD and pocket dosimeter was designed and used that would compensate for the underresponse of the pocket dosimeter.
3. Actions to preclude this in the future are as follows:
- a. The evaluation of exposure conditions in the hand hole will be expanded to include the response of TLD's and pocket dosimeters in the sludge lancer's geometry.
 - b. The frequency of readings of pocket dosimeters during the progress of steam generator sludge lancing work will be increased.
4. Full compliance has been achieved.

FINDING B.2

Contrary to the above, during the period of November through December 1985, no evaluations were performed prior to sludge lancing work to determine that the direct reading dosimeters, used as exposure control devices, adequately measured individual exposures under the conditions and in the geometry that they were going to be used. The licensee subsequently determined that the direct reading dosimeters had under-responded 26 to 40 percent. The effect of the underresponse was that worker exposures were higher than they were expected to be.

RESPONSE

1. We concur with the statement as written, but provide the following comments. It is our opinion that based on industry practice, a reasonable evaluation was performed. This included a determination of both radiation levels and gradients present, and comparisons between pocket dosimeter response to radiation survey instrument response (in the steam generator) prior to performing sludge lancing work. Pocket dosimeter underresponse was not expected due to close agreement between them and radiation survey meter results.

This level of detailed analysis is not currently in place in the industry. As determined by a self-initiated industry survey, out of 6 utilities contacted, only one had approached this level of detail for evaluating exposure control devices. We feel it is prudent to provide additional detail as described in our corrective actions stated in our response to B1.

ATTACHMENT A (cont.)

Evaluations performed prior to initiation of sludge lancing work included the following:

- a. Pocket dosimeters are calibrated on a semiannual basis. Nonconforming dosimeters are removed from use. All dosimeters used during sludge lancing work had been calibrated prior to their use.
 - b. Surveys of the sludge lancing work area had been performed with calibrated survey instruments and dosimeters. The correlation between the two surveys was good.
2. See response to Finding B-1, item 2
 3. See response to Finding B-1, item 3
 4. Full compliance has been achieved

Attachment B is provided for amplification of information provided in this response.

44



ATTACHMENT B
AMPLIFICATION OF INFORMATION

RE: St. Lucie Unit 1
Docket Nos. 50-335
Inspection Report 335/86-01, EA 86-53

FINDING A

1. The St. Lucie Plant ALARA Program, Administrative Procedure 3300120, requires a review of work projects requiring a Radiation Work Permit (RWP). The detailed level of review increases with the projected dose of the work project.

The ALARA review for the sludge lancing project was accomplished for RWP 85-1417. Some of the more pertinent results of this review were as follow:

- a. Radiation levels in excess of 100 mR/hr with a gradient in excess of 25% across the exposed portion of the whole body existed in the hand hole. The existence of these two conditions required the addressing of dosimetry placement and relocation or use of multiple sets of dosimetry.
- b. It was determined that relocation of the whole body dosimetry from the normal location on the trunk to the upper arm was required. In order to accurately monitor exposure while not adversely interfering with arm motion, the dosimetry was placed on the lower part of the upper arm as close to the elbow as practical.

This relocation of whole body dosimetry was only necessary for insertion of the upper arm into the hand hole. Extremity monitoring dosimetry was also provided in the event the hands and wrists received doses greater than that received by the upper arm.

- c. Stay times were established based on dose rates of survey instruments and pocket dosimeter response in the area the arm would occupy.
- d. Temporary shielding was constructed on the work platform to reduce the exposures of attending personnel when not making hand hole entries.
- e. A detailed briefing of involved Health Physics personnel was performed to ensure stay times and dose rates were clear.

44



ATTACHMENT B (cont.)

2. In addition to the ALARA procedure, Health Physics Procedure HP-1, Radiation Work Permits, requires that any work involving radiation levels exceeding 100 mR/hr be performed under a RWP. The RWP contains written instructions to be followed as well as radiological conditions. RWP 85-1417 contained specific requirements for personnel to notify Health Physics prior to commencing work, continual Health Physics coverage during the work, established dosimetry relocation to the upper arm and the inclusion of high range pocket dosimeters for sludge lancing work. All of these requirements were followed.

Both of the procedures discussed above are reviewed by the Facility Review Group and approved by the Plant Manager. The use of these procedures in the sludge lancing project provided adequate control of the job.

Supplementing these procedures, training was provided to the Health Physics Technicians assigned to the project. The sludge lancing project was discussed in detail. This encompassed:

- a. Detailed Description of the project,
- b. Radiation fields to be encountered,
- c. Dosimetry relocation and
- d. Stay times based on radiation levels.

FINDING B.1

1. The Health Physics Technician followed the instructions on the High Radiation Area Entry Authorization form in that he controlled the worker's exposure by controlling the time the worker's arm was in the hand hole. The authorized stay time was five minutes 30 seconds. The actual stay time of the worker was five minutes 30 seconds.

The practice of using stay time to control the exposure of workers is standard Health Physics practice of long standing. Previous entries in the hand hole showed good agreement between the pocket dosimeters doses recorded and the pocket dosimeters doses expected by use of the stay time.

While a strong argument can be made for reading pocket dosimeters on a more frequent basis and FPL agrees with this argument, FPL also strongly believes that effective exposure control can be and has been accomplished through the use of established staytimes.

44



ATTACHMENT B (cont.)

FINDING B.2

FPL provides the following additional comments:

1. By procedure, pocket dosimeters are checked for acceptable response on a semiannual basis. The dosimeters are exposed to known amounts of radiation and the dosimeter response is evaluated against established criteria. Non-conforming dosimeters are removed from service. The pocket dosimeters used in the sludge lancing work had passed the acceptance criteria. The net effect from performing this procedure is to provide Health Physics personnel with reasonable assurance that the exposure recorded by the pocket dosimeter is representative of the exposure actually received by the worker wearing the dosimeter.
2. By procedure radiation surveys are performed prior to the issuance of a RWP in order to implement adequate radiological controls. The surveys performed for the sludge lancing work included;
 - a. A survey of the work area with a calibrated survey instrument and recording the radiation levels found in the work area.
 - b. A survey of the work area using pocket dosimeters was performed for comparison to the portable instrument survey results.
 - c. The exposures recorded by the pocket dosimeters agreed with the dose rates obtained by portable survey instruments.
 - d. Determination of stay times were obtained from results from a, b, & c above.
3. When taken together, the acceptable response of the pocket dosimeters to known amounts of radiation and the agreement between the pocket dosimeter survey and the portable survey instrument survey, FPL does not believe there was any reasonably identifiable evidence leading to the conclusion that the pocket dosimeters would under respond by 26 to 40 percent in the work environment.
4. FPL surveyed several utilities to determine the methods used by the industry for close control when performing sludge lancing. All those utilities contacted, with the exception of one, used stay times as the control measure and had not determined that there was an under response of the pocket dosimeters. The one utility that was the exception used stay times for dose control and had determined that pocket dosimeters significantly under responded during sludge lancing conditions. This information had not been made available to the industry.

Upon confirmation of pocket dosimeter under response during sludge lancing, FPL immediately notified the industry of its findings.

1000

