APPENDIX

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-382/83-23 License: CPPR-103

Docket: 50-382

Licensee: Louisiana Power and Light Company (LP&L)
142 Delaronde Street
New Orleans, LA 70174

Facility Name: Waterford Steam Electric Station, Unit No. 3 (WF-3)

Inspection At: Taft, Louisiana

Inspection Conducted: July 11-15, 1983

Inspector: H. Chaney 8/5/83
H. D. Chaney, Radiation Specialist Date

Approved: Blaine Murray 8/5/83
Blaine Murray, Chief, Facilities Radiation Protection Section Date

for W. A. Crossman, Reactor Project Section B C. R. Oberg 8/9/83
Date

Inspection Summary

Inspection Conducted on July 11-15, 1983 (Report 50-382/83-23)

Areas Inspected: Routine, announced continuation of the preoperational inspection (NRC Inspection Reports 50-382/82-04 and 50-382/83-04) of the licensee's radiation protection program, and licensee actions taken on 12 open items identified in the aforementioned reports. The inspection involved 32 onsite (WF-3) hours and 4 offsite (corporate office) hours by one NRC inspector.

Results: Within the areas inspected, no violations or deviations were identified. Nine previously identified open items were closed during this inspection.

IE01

DETAILS

1. Persons Contacted

LP&L

*S. A. Alleman, Assistant Plant Manager
*Z. A. Sabri, Director of Nuclear Training
*R. W. Kenning, Health Physics (HP) Department Superintendent
*K. R. Iyengar, Technical Services Manager, Nuclear Project Support
*C. J. Toth, Nuclear Training Manager
*W. M. Morgan, Operations Quality Assurance (QA) Engineer
*D. M. Hall, HP Administration Supervisor
*A. R. Roberts, QA Associate Engineer
*J. G. Funk, HP Supervisor
*D. L. Hoel, HP Supervisor
*E. M. Rollins, Utility Engineer, Nuclear

Others

*G. L. Constable, NRC Senior Resident Inspector
*T. Fliopo, NRC Resident Inspector

*Denotes those present during the exit interview.

The NRC inspector also interviewed other WF-3 station personnel during this inspection.

2. Licensee Action on Previous Inspection Findings:

Below listed are summaries of actions taken on those remaining open items (12) that were part of the initial 22 open items addressed in NRC Inspection Report 50-382/82-04. As of this report, a total of 10 open items concerning the WF-3 radiation protection program had been closed. See NRC Inspection Reports 50-382/82-04 and 50-382/83-04 for details.

(Closed) Open Item (382/8116-04): Unshielded Reactor Coolant Sample Lines - This item was initially identified in NRC Inspection Report 50-382/81-16 and also discussed in the NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the installation of unshielded reactor coolant sample lines near the proposed HP field office. The licensee had completed the rerouting and installation of new sample lines that satisfactorily resolves the NRC's concerns. See paragraph 10 for details. This item is considered closed.

(Closed) Open Item (382/8204-01): Corporate Radiation Protection Organization - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the incomplete staffing of functional areas, completing of staff position descriptions, and development of operational procedures. The licensee's corporate radiation control section (RCS) had completed organizational staffing, development of satisfactory functional position descriptions, and implementation of necessary operational procedures. See paragraph 4 for details. This item is considered closed.

(Closed) Open Item (382/8204-03): Radiation Protection Organization Qualification - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the establishment of guidance for determining acceptable training and experience for assignment of personnel to functional areas of the HP group. The licensee had implemented procedures that specified necessary qualification for assignment to functional areas of the HP group, including personnel screening examinations. These procedures provide sufficient guidance for establishing the amount of qualifying experience for LP&L or contract HP technicians and adequately resolve the NRC concerns in this area. This item is considered closed.

(Open) Open Item (382/8204-04): Radiation Protection Training - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the lack of an established radiation protection training program for HP activities and general employees. The licensee had resolved several of the NRC's concerns in this area; however, completion of several HP technician training modules and completion of instructor staffing remain to be resolved. See paragraph 6 for details. This item is considered open pending further licensee action.

(Closed) Open Item (382/8204-05): External Radiation Exposure Control Program - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the lack of a broad range calibration program for the dosimetry system, and the implementation of a detailed QA/QC program for system operation and periodic performance checks. The licensee's corrective actions have adequately resolved the NRC's concerns in this area. See paragraph 7.a for details. This item is considered closed.

(Closed) Open Item (382/8204-06): Internal Radiation Exposure Control Program - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the lack of a suitable bioassay program. The licensee had resolved the NRC's concerns regarding the back calculating to exposure concentrations from bioassay results and participation in an independent crosscheck program. See paragraph 7.b(1) for details. This item is considered closed.

(Closed) Open Item (382/8204-07): Respiratory Protection Program - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the establishment of a respiratory protection program that satisfied the requirements of 10 CFR Part 20.103. The licensee had implemented suitable procedures to adequately resolve the NRC's concerns involving protection factors for respiratory equipment, breathing zone sampling, and loose surface contamination limits. See paragraph 7.b.(2) for details. This item is considered closed.

(Closed) Open Item (382/8204-08): Radiological Surveys - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and

involved the establishment of a comprehensive radiological survey program, including a survey record management system. The licensee had implemented procedures that suitably addressed an alpha contamination survey program, routine eating facility surveys, and implementation of consistent station contamination limits. See paragraph 7.c for details. This item is considered closed.

(Closed) Open Item (382/8204-13): HP Protective Equipment and Supplies - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the procurement and management of equipment and supplies such as protective clothing and expendable equipment/materials. The licensee had secured a vendor for protective clothing and established the minimum station needs for protective clothing. See paragraph 8 for details. This item is considered closed.

(Open) Open Item (382/8204-14): Radiation Protection Instrumentation - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the procurement of all HP instrumentation committed to in the FSAR, and development of suitable calibration procedures for the instruments. The licensee had implemented calibration procedures that satisfied the recommendations set forth in ANSI Standard 323-1978 for gamma, alpha, and neutron dose rate measuring devices. However, the licensee had not implemented suitable calibration procedures for breathing zone air sampling devices, continous air monitor (CAMs), and beta radiation dose rate measuring instruments. See paragraph 9 for details. This item is considered open pending further licensee action.

(Closed) Open Item (382/8204-15): Facilities - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the lack of facilities for the HP group activities. The licensee had completed construction and turnover of all plant spaces allocated for the HP field office, respiratory protection equipment and maintenance, and protective equipment storage. See paragraph 10 for details. This item is considered closed.

(Closed) Open Item (382/8204-17): Reactor Startup Surveys - This item was discussed in NRC Inspection Reports 50-382/82-04 and 50-382/83-04, and involved the completion of the radiological survey procedure for determining shielding effectiveness during initial reactor power ascension, and a program to verify plant airflow characteristics. The licensee had issued an approved biological shield survey procedure that satisfies the NRC's concerns in this area. See paragraph 11 for details. This item is considered closed.

3. Open Items Identified During This Inspection

None

4. Corporate Radiation Protection Organization

The NRC inspector examined the licensee's offsite corporate office organizations regarding radiation protection activities to determine compliance with FSAR commitments, and recommendations of NRC Regulatory Guide (RG) 8.8 and NUREG-0731.

The licensee's corporate radiation protection organization was found to be organized as previously depicted in figure 1 of NRC Inspection Report 50-382/82-04. The licensee had filled the lead engineer position of the radiation control section with a certified health physicist that possesses suitable commercial reactor health physics experience. Currently the licensee is actively seeking a person to fill a recently vacated utility engineer position in order to complete organization staffing. The NRC inspector considers the licensee's filling of the lead engineer position to satisfy the NRC's concerns addressed in NRC Inspection Report 50-382/83-04 involving filling the lead engineer position. The NRC inspector also determined that the licensee had implemented appropriate functional work area operating procedures for the radiation control section to ensure that appropriate support is provided WF-3. This item (382/8204-01) is considered closed.

5. Site Radiation Protection Staff Qualifications

The NRC inspector reviewed the licensee's criteria for evaluating health physics technician experience to determine compliance with the recommendations set forth in NRC branch position statement of August 26, 1980, concerning man-hours worked to years experience conversion factor.

The licensee had revised WF-3 procedure HP-1-217, "Health Physics Qualifications," to reflect the use of a conversion factor of 1 year's experience per 2000 hours of work acquired in a period of no less than 40 weeks duration. The licensee's actions satisfactorily resolve the NRC's remaining concerns in this area. This item (382/8204-03) is considered closed.

6. Radiation Protection Training Program

The NRC inspector reviewed the licensee's radiological training programs to determine compliance with: FSAR commitments; the requirements of 10 CFR Part 19.12; and the recommendations of NRC RGs 8.13, 8.27, and 8.29, and ANSI N18.1-1971.

The NRC inspector found the nuclear training department to be organized the same as shown in NRC Inspection Report 50-382/83-04 (figure 2). The NRC inspector reviewed WF-3 employee training records for completeness and comparison against current functional area assignments. The records of approximately 70 percent of the personnel assigned to the HP group were reviewed. The NRC inspector also reviewed selected lesson plans and

evaluation tests for both HP technician and radiation worker training programs. A session of WF-3 radiation worker training - General Employee Training 2 - including a practical factors demonstration involving full protective clothing was observed. The NRC inspector determined that lesson plans for general employee (GET-1) and radiation workers including respiratory protection training (GET-2, 3, and T-4) appeared to satisfy the recommendations of NRC RGs 8.15 and 8.27. Health physics technician training lessons plans are nearly complete with only a few more plans to be developed involving such areas as calculation of effluent releases, and offsite dose calculation manual. The licensee had completed approximately 90 percent of all initial training, including reactor plant systems, for HP technicians. The licensee is currently providing GET-1 (introduction) requalification training for WF-3 employees. The licensee had not determined, as of this inspection, as to the course content for requalification for radiation workers, GET-2. Requalification for respiratory protection will include a medical status review and quantitative man-fit tests employing a challenge atmosphere at a known concentration.

The NRC inspector determined that the licensee had three instructors assigned to HP and general employee radiation protection training programs. Recent cutbacks by the licensee in the use of contractor instructors may cause the radiation protection instructor staff to be reduced to one person plus a supervisor in the near future. The licensee acknowledged the inspector's concern and indicated that they have instituted an agressive instructor recruitment program. Licensee position descriptions for instructors providing radiological controls training require that personnel have previous experience in applied radiation protection activities such as would be acquired by radiation protection personnel. The NRC inspector advised the licensee that eventhough several areas of concern had been resolved, this item (382/8204-04) would remain open pending completion of instructor staffing (radiation protection training) and HP technician training.

7. Personnel Radiation Exposure Control Program

a. External

The NRC inspector reviewed the licensee's external dose control program to determine compliance with: FSAR commitments; the requirements of 10 CFR Parts 19.13, 20.101a, 20.101b, 20.104a, 20.202a, 20.401a; and the recommendations contained in NRC RGs 8.4, 8.8, 8.14, and those of ANSI N13.2-1969, N13.6-1972, N13.11-1978, and N319-1976.

A review of licensee programs and operational procedures showed that the licensee had resolved the remaining NRC concerns involving the external radiation exposure control and dosimetry program. The licensee had issued new procedures or revised existing ones to provide for the

following:

- Completion of program operational procedure implementation
- Implemented a quality control program for personnel dosimetry that provides for:
  - Verification that low dosages (75-100 mRem) can be accurately assessed
  - Participation in a dosimetry cross-check program with an independent laboratory

This item (382/8204-05) is considered closed.

b. Internal Exposure Control

The NRC inspector reviewed the licensee's internal exposure program to determine compliance with: FSAR commitments; the requirements of 10 CFR Parts 20.103, 20.201, and 20.401; and the recommendations of NRC RGS 8.7, 8.9, 8.15, 8.20, and 8.26; and those of ANSI N343-1978.

(1) Internal Dosimetry

The licensee had resolved the remaining NRC concerns regarding the bioassay program for internal dose assessment by issuance of new procedures or revision of existing procedures. The licensee had initiated actions to participate in a cross-check program (using spiked sources - adaptable to the whole body phantom) with a contractor to provide additional assurance that their whole body counter (WBC) is making proper internal dose assessments. The licensee's contractor for indirect bioassay services participates in a quality control cross-check program with a recognized national laboratory, and licensee procedures now provide for the proper collection, preparation, and shipment of indirect bioassay (excreta) samples to the contractor. The licensee had issued an HP departmental procedure HP-2-107 that provides for back-calculating of maximum permissible concentration-hours (MPC-hr) of exposure based on bioassay results.

This item (382/8204-06) is considered closed.

(2) Respiratory Protection Program

The licensee had implemented procedures that resolved the remaining NRC concerns regarding respiratory equipment protection factors, airborne alpha radioactivity monitoring, and representative sampling of workers' breathing zones. The NRC inspector reviewed the

licensee's functional procedures governing the above-noted subjects and found that consistent and proper respiratory protection factors are being provided (same as referenced in Appendix-A to 10 CFR Part 20), alpha surveys of air samples are required, and that instructions for use of worker breathing zone air samplers have been provided. The licensee had also implemented a respiratory equipment issue program that employs an HP department-managed record system to verify the current qualification status of personnel requesting the use of respiratory protection equipment. The licensee had also specified at what levels of loose surface contamination respiratory protection equipment will be required.

This item (382/8204-07) is considered closed.

(3) Radiological Surveys

The NRC inspector determined that the licensee had resolved the NRC's concerns regarding establishment of routine alpha contamination surveys, routine eating facility surveys, and the implementation of consistent loose surface contamination limits at WF-3. The licensee's contamination control program was thoroughly discussed with the licensee and found to be adequate to support a weekly survey frequency of WF-3 eating facilities.

This item (382/8204-08) is considered closed.

8. Health Physics Supplies and Protective Equipment

The NRC inspector reviewed the licensee's inventory of protective equipment and supplies for such items as anticontamination (protective) clothing, radiological warning signs and labels, personnel decontamination supplies, step off pads, respirators, etc., to determine the licensee's capability to support radiological work operations during routine and nonroutine events.

The licensee had completed initial procurement of routinely used HP supplies, including protective clothing (1000 sets) and air-fed-hoods. The licensee is in the process of evaluating the use of a contractor to supply additional protective clothing and laundry as a combined service. The licensee tracks all expendable supplies by a spare parts inventory system which the radiation protection group will use to maintain minimum stockage level of expendable HP supplies.

This item (382/8204-13) is considered closed.

9. Radiation Protection Instruments and Calibration

The NRC inspector reviewed the licensee's radiation protection instrumentation program to determine compliance with: FSAR commitments; and the recommendations of NRC RGs 8.4 and 8.25, and those of ANSI N323-1978.

The licensee had resolved several of the concerns raised in NRC Inspection Reports 50-382/82-04 and 50-382/83-04. The NRC inspector determined that the licensee had implemented operating and calibration procedures for alpha contamination measurement instruments, verified that the contractor used for neutron instrument calibration was using a suitable quality assurance program and that the licensee's quality assurance department had accepted the contractor, provided instructions for the operational evaluation of portable frisker probes. The licensee indicated that the FSAR commitment for self-reading neutron dosimeters was in error and that a proposed ammendment (#32) to the FSAR had been submitted to the NRC. Development of procedures for the calibration of lapel air samplers and continuous air monitors (CAMS) are still in the development stage.

The NRC inspector reviewed the licensee's proposed calibration program for portable beta radiation exposure measurement instruments for agreement with current health physics industry practices and theories. The licensee had adopted to use only one type (even though several other types of beta measuring instruments are available at WF-3) of portable instrument to assess beta dose rate measurements. This instrument is an air-filled (atmospheric pressure-vented) ion chamber with a movable beta shield positioned over a 7 milligram per square centimeter mylar window that can detect either gamma or beta radiation in the range of 0-50,000 mRem per hour. The proposed calibration program for this instrument (beta calibration is not performed on other dual purpose instruments) will ivolve the following:

- Full range calibration using a cesium-137 source
- Response determination using the open versus closed window readings produced by contact readings using a depleted uranium plaque
- Establishing a beta contact correction factor (BCCF) based upon instrument response versus the known exposure rate of the uranium plaque.
- Additionally enhancing the derived BCCF by a factor of 2 to account for the difference in instrument's response due to an anticipated WF-3 beta component energy level of 0.5 million electron volts (MEV) to 1.5 MEV which is significantly lower than the uranium plaque's.

The licensee's program appears to be in accordance with current industry theories on beta radiation measuring instrument response; however, the following concerns do not appear to be adequately addressed:

- Establishment of a program to periodically reevaluate the beta energy spectrum in WF-3 work areas and adjust, as necessary, the BCCF energy compensation factor and the general area beta correction factors

- Correlation of the dose rate measurements obtained with portable instruments to those obtained with WF-3 personnel dosimetry (TLDs)

- Providing procedural instructions that will ensure that only beta calibrated/factored instruments are used for beta dose rate surveys

This item (382/8204-14) is considered open pending licensee action to:

- Provide calibration procedures for CAMS and lapel air samplers

- Resolve the NRC's concerns about the beta dose rate measuring instrumentation calibration program

10. Radiation Protection Facilities

The NRC inspector visited and reviewed the facilities to be used by the HP staff in carrying out their various radiation protection functions at WF-3. The licensee had accepted all areas noted in NRC Inspection Report No. 50-382/82-04 from the construction contractor. Anticipated personnel flow paths to and from work areas in the reactor containment to the reactor access building were reviewed. These flow paths were found acceptable in the degree of personnel access and contamination control afforded. HP personnel office space appears to be adequate. The licensee had completed rerouting of the reactor coolant sample lines (See NRC Inspection Reports 50-382/81-16 and 50-382/83-04 for details) to an acceptable location that does not involve the lines passing through/near areas expected to be routinely occupied by personnel.

Both items (382/8116-04) and (382/8204-15) are considered closed.

11. Reactor Startup Surveys

The NRC inspector reviewed the licensee's procedures for conducting reactor shielding surveys during reactor power-ascension testing to determine compliance with: FSAR commitments and the recommendations in NRC RG 1.68. The NRC inspector also reviewed the program for ensuring that plant air flow characteristics are as per the design prior to plant operation.

The licensee's reactor startup procedure and plant air flow characteristics testing programs were reviewed and found satisfactory in regard to NRC RG 1.68 (R-2 1978) recommendations and the licensee's commitments in the FSAR.

This item (382/8204-17) is considered closed.

12. Exit Interview

The NRC inspector met with licensee representatives identified in Section 1 at the conclusion of the inspection on July 15, 1983. The NRC solicited a commitment from the licensee to provide both the NRC site office and the regional office with continued distribution of all HP operating procedures (safety and departmental). The NRC inspector stated the remaining open items identified in the report that had not been satisfactorily resolved during this inspection must be resolved before issuance of an operating license.