

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-382/92-21

Operating License No. NPF-38

Licensee: Entergy Operations, Inc. (E01)
P.O. Box B
Killona, Louisiana 70066

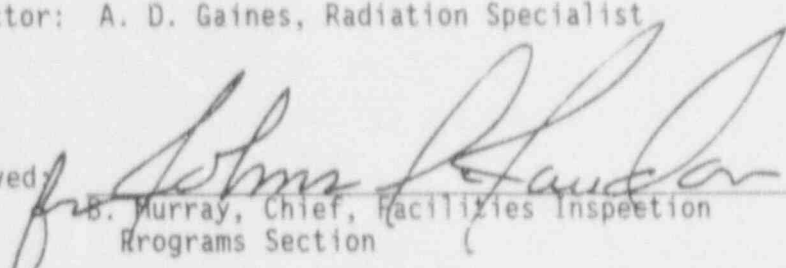
Facility Name: Waterford Steam Electric Station, Unit 3

Inspection At: Waterford-3 Site, Killona, St. Charles Parish, Louisiana

Inspection Conducted: July 28-31, 1992

Inspector: A. D. Gaines, Radiation Specialist

Approved



B. Murray, Chief, Facilities Inspection
Programs Section

8/12/92
Date

Inspection Summary

Inspection Conducted July 28-31, 1992 (Report 50-382/92-21)

Areas Inspected: Routine, announced inspection of selected portions of the occupational radiation protection program including: changes; external exposure control; internal exposure control; control of radioactive materials and contamination, surveys, monitoring; and audits and surveillances.

Results: Within the areas inspected, one violation was identified: failure to demarcate clearly a contaminated area (paragraph 2.4). No deviations were identified. A summary of the other findings is as follows:

- o An excellent thermoluminescent dosimeter processing program was maintained; this program included quality assurance checks performed in-house and by a vendor.
- o Thermoluminescent dosimeter and self-reading dosimeter results were in good agreement.
- o Dosimetry problem reports had been reviewed, and appropriate actions taken.
- o The ALARA program had excellent practices to reduce radiation exposure.

- o ALARA post-job reviews were found to be excellent.
- o Person-rem goals were exceeded for 1991 for reasons other than poor radiation work practices.
- o The licensee maintained a very good respiratory protection program.
- o Respiratory equipment was stored and maintained properly.
- o The licensee's 40-hour maximum permissible concentration log was well maintained and indicated that exposures in excess of 40 maximum permissible concentration hours had not occurred.
- o Engineering controls were used effectively to reduce the usage of respiratory protective equipment.
- o The whole-body counting program was very good.
- o Radiological housekeeping and controls were very good.
- o Sufficient quantities and types of calibrated portable radiation survey meters were maintained.
- o Adequate airborne and radiation surveys were performed.
- o The percent of the radiologically controlled area contaminated was maintained below the licensee's goal of 5 percent.
- o Comprehensive, technical audits and surveillances were performed by qualified personnel.

DETAILS

1. PERSONS CONTACTED

EOI

- *T. R. Leonard, Technical Services Manager
- *A. S. Bergeron, Chemistry Supervisor
- *T. J. Gaudet, Operational Licensing Supervisor
- B. L. Goldman, ALARA Coordinator
- *D. L. Hoel, Health Physics Supervisor
- *P. M. Kelly, Health Physics Supervisor
- *D. Landeche, Lead Health Physics Supervisor-Operations
- T. P. Lett, Health Physics Shift Supervisor
- *A. S. Lockhart, Quality Assurance Manager
- R. C. McLendon, Dosimetry Supervisor
- *S. Ramzy, Radiation Control Supervisor
- *J. A. Ridgel, Radiation Protection Superintendent
- *J. C. Ruffin, Health Physics Technician
- *C. J. Thomas, Licensing Engineer

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- W. F. Smith, Senior Resident Inspector
- *J. L. Dixon, Resident Inspector
- *L. Wilborn, Radiation Specialist

*Indicates those present during the exit meeting on July 31, 1992.

The inspector also interviewed other licensee and contractor personnel including administrative, health physics, and quality assurance personnel during the course of the inspection.

2. OCCUPATIONAL RADIATION EXPOSURE (IP 93750)

Portions of the licensee's radiation protection program were examined to determine compliance with the requirements of Technical Specifications 6.3, 6.4, 6.8, 6.11, and 6.12 and agreement with Chapters 12 and 13 of the Final Safety Analysis Report.

2.1 Changes

The inspector determined that there have been no major changes in the radiation protection program since the previous inspection with regard to organization, facilities, programs, or procedures. The licensee had received new equipment since the previous inspection including two PM-7 portal radiation monitors and a personal computer based gamma spectroscopy system. The licensee also plans to have a new, standup, whole-body counter onsite and in use for the next refueling outage.

2.2 External Exposure Controls

The inspector determined the licensee's external radiation exposure control program consisted of whole body monitoring using thermoluminescent dosimeters, self-reading dosimeters, direct surveys, radiation work permits, ALARA dose reduction methods, and administrative dose limits. The thermoluminescent dosimeters used by the licensee are Panasonic UD302, which contain four chips. The four chips have shielding thicknesses of 14, 300, 300, and 1000 milligrams per cubic centimeter.

The licensee had received accreditation by the National Voluntary Laboratory Accreditation Program in all eight categories. The licensee had performed quarterly and monthly quality assurance checks of thermoluminescent dosimeter processing. The quarterly checks were performed by a vendor and the monthly checks were performed in house. The licensee maintained an excellent thermoluminescent dosimeter processing program.

Daily radiation exposures were tracked by self-reading dosimeter results. The licensee had a good program for comparing thermoluminescent dosimeter and self-reading dosimeter results. The licensee had shown good agreement between thermoluminescent dosimeter and self-reading dosimeter results. The licensee maintained adequate procedures for handling disagreements between thermoluminescent dosimeter and self-reading dosimeter results. Except for a potential overexposure reviewed by NRC Inspection Report No. 50-382/91-28, no exposures greater than 10 CFR 20.101 limits were noted.

The inspector reviewed selected dosimetry problem reports. Dosimetry problem reports had been written for lost thermoluminescent dosimeters, lost self-reading dosimeters and disagreements between thermoluminescent dosimeter and self-reading dosimeter results. The licensee had performed good reviews and had taken appropriate action in response to dosimetry problem reports.

The ALARA program has made excellent use of a number of practices to reduce collective and individual radiation exposure. For example, the licensee planned to change from a 0.45 micron to a 0.2 micron letdown filter; the licensee has a hot spot reduction plan, performed dose rate trending, and had a program for the reduction of cobalt contamination. The inspector reviewed selected ALARA post-job reviews and found them to be excellent. The licensee had established a goal of 265 person-rem for 1991, but 345 person-rem were expended. The higher person-rem expenditure was attributed to out-of-scope work, extended repair work, and the higher reactor head radioactivity for refueling Outage 4. The person-rem goal for 1992 had been set at 240 person-rem, and as of June 30, 1992, approximately 21 person-rem had been expended. Most of the 21 person-rem expended was associated with mini-outages for steam generator manway repairs and RC-104 valve repairs.

No violations or deviations were identified.

Conclusions

The licensee maintained an excellent thermoluminescent dosimeter processing program which included quality assurance checks performed in-house and by a vendor. Thermoluminescent dosimeter and self-reading dosimeter results were in good agreement. Dosimetry problem reports had been reviewed and appropriate actions were taken. The ALARA program had excellent practices to reduce radiation exposure. ALARA post-job reviews were found to be excellent. Person-rem goals were exceeded for 1991 for reasons unrelated to poor radiation work practices.

2.3 Internal Exposure Controls

The inspector noted that the licensee's internal exposure control program consisted of whole-body counting, respiratory protection, airborne radioactivity sampling, and engineering controls.

The inspector reviewed the licensee's respiratory protection program including policy statements, directives, implementing procedures, and respiratory protection equipment. The licensee maintained a sufficient supply of respiratory protective equipment to support plant activities. Selected records of individuals who had been issued respirators were reviewed, and it was determined that the individuals had been trained, fit tested, and medically certified to wear respiratory equipment. Respiratory equipment was noted to be stored and maintained properly. The licensee used a vendor on their qualified supplier list to certify that breathing air supplies were of Grade D or better.

The licensee's airborne radioactivity survey program used breathing zone (LAPTEL) and general area air sampling techniques. Personnel were routinely provided with a LAPEL air sampler, one per work crew, to ensure the accuracy of the general air samples, and to verify that job evolutions were not creating a local airborne radioactivity concern. Selected air sample records were reviewed and found to be adequate. The inspector reviewed the licensee's 40-hour maximum permissible concentration log and noted that it was well maintained and that the log indicated no exposures in excess of 40 maximum permissible concentration hours had occurred.

The inspector reviewed the use of engineering controls to reduce the usage of respiratory protective equipment. The licensee uses portable ventilation units which contain high efficiency particulate airborne filters to control the airborne radioactivity in glove boxes, tents and enclosures, and rooms. The inspector observed several high efficiency particulate airborne filter units and noted that the licensee had DOF leak tested the units.

The inspector determined that the licensee had a very good whole-body counting program. The licensee's whole-body counting program provided for whole-body counts upon initial entry into the radiologically controlled area, annually, upon termination, upon suspected internal deposition, and for facial contamination. The inspector reviewed selected reports of facial contamination and noted that a whole-body count had been performed. The

results of the whole-body counts had been properly reviewed and acted upon by the licensee.

No violations or deviations were identified.

Conclusions

The licensee maintained a very good respiratory protection program. Respiratory equipment was stored and maintained properly. LAPEL air samplers were routinely used for breathing zone air samples. The licensee's 40-hour maximum permissible concentration log was well maintained and indicated that exposures in excess of 40 maximum permissible concentration hours had not occurred. Engineering controls were used effectively to reduce the usage of respiratory protective equipment. The whole-body counting program was very good.

2.4 Control of Radioactive Materials and Contamination, Surveys, and Monitoring

During tours of the facility, the inspector observed the licensee's posting and control of radiation areas, high radiation areas, contamination areas, radioactive materials areas, and labeling of radioactive material. During these tours, the inspector observed that housekeeping in the facility was very good. The inspector did not note any apparent problems with the areas observed, except for the contaminated area in Safeguards Room A.

On July 28, 1992, the inspector toured the facilities with a health physics supervisor. After entering Safeguards Room A, the supervisor noted, along with the inspector, that the rope boundaries on one of the posted contaminated areas was on the floor. The supervisor went over to replace the boundary ropes. The inspector noted that the supervisor appeared to be in the contaminated area. The inspector informed the supervisor that he may be in a contaminated area. The supervisor acknowledged that he probably was and proceeded to a frisker station. The supervisor performed a radiation survey of his feet and hands, and the results indicated that they were not contaminated. The supervisor then took appropriate corrective actions to survey the area where the rope boundaries were down and reinstate the rope boundaries.

Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained for activities referenced in Appendix A of Regulatory Guide 1.33, Revision 3, February 1978. Section 7.e.(4), Appendix A, Regulatory Guide 1.33, references the contamination control system. Section 5.2.2.2 of Administrative Procedure HP-001-219, "Radiological Posting Requirements," requires that contamination area postings be clearly demarcated with the appropriate boundary ropes/ribbon, signs, and stanchions as necessary to control the activity. The failure to follow Procedure HP-001 219 and have the contaminated area postings clearly demarcated in Safeguards Room A is a violation of Technical Specification 6.8.1 (382/9221-01).

The inspector noted that on the survey map dated July 23, 1992, posted outside Safeguards Room A, the drawing of the contaminated area was not representative of the actual contaminated area the supervisor inadvertently entered to restore the rope boundaries. This was brought to the attention of the health physics supervisor, who stated that he would look into the discrepancy. The inspector was subsequently informed by the Radiation Protection Superintendent that the contaminated area was expanded on July 27, 1992, from two areas close to each other to one larger area for better control. The superintendent further stated that, since the area was expanded, not for radiological purposes but for better control, a survey had not been performed; therefore, the survey map was not required to be updated. The inspector expressed the concern that not updating survey maps when areas are expanded could cause confusion and the possibility of boundary ropes not being restored to enclose all of a contaminated area if the ropes were found down. The Radiation Protection Superintendent noted the inspectors concern.

The inspector reviewed the licensee's corrective actions to Licensee Event Report (LER) 91-006, which involved a technician contaminated with a hot particle not alarming the PM-7 portal monitors when exiting the plant. The licensee's main corrective action was to have two new PM-7s installed and operating for refueling Outage 5, one at the primary access point and the other at the exit to the radiologically controlled area at the -4 foot elevation. The licensee's new PM-7s were delivered and installed by a vendor during the week of this inspection. Inspector discussions with the licensee determined that the licensee was in the process of revising their calibration procedures for the PM-7s and, therefore, had not yet calibrated the new PM-7s. The inspector informed the licensee that since the PM-7s were not calibrated and in use that LER 91-006 would be reviewed further during a future inspection.

The licensee had maintained sufficient quantities and types of calibrated portable radiation survey meters. Selected calibration records were reviewed, and the inspector noted that the calibrations had been performed properly. The inspector noted that portable radiation survey meters had been source checked daily. A review of selected records indicated that portal monitors, continuous air monitors, friskers, and personal contamination monitors had been calibrated at the proper frequencies.

The inspector reviewed selected airborne radioactivity, daily radiation, and weekly radiation surveys and found them to have been performed adequately. Skin contamination reports were reviewed, and it was noted that the licensee had performed a good review of the incident and appropriate actions were taken including decontamination, dose assessment, and whole-body counting for facial contamination.

The licensee's goal was to maintain station surface contaminated areas at less than 5 percent of the total radiologically controlled area during nonoutage periods. At the end of June 1992, the percentage of contaminated area was 4.67 percent.

One violation and no deviations were identified.

Conclusions

One violation involving the failure of a contaminated area to be clearly demarcated was identified. Radiological housekeeping and controls were very good. Sufficient quantities and types of calibrated portable radiation survey meters were maintained. Adequate airborne and radiation surveys were performed. The percent of the radiologically controlled area contaminated was maintained below the licensee's goal of 5 percent.

2.5 Audits and Surveillances

The inspector reviewed licensee quality assurance audits and surveillances conducted on the occupational radiation protection program. The following reports were reviewed:

Audits

SA-91-018B.1, "External and Internal Exposure Control and Dosimetry,"
June 7 - August 29, 1991

SA-92-018A.1, "ALARA Program," March 16 - April 7, 1992

SA-92-018D.1, "Health Physics Program Radioactive Contamination/Respiratory Control," (DRAFT)

Surveillances

QS-92-006, "QA Surveillance of Surveying and Posting of Radioactive Materials Areas and Labeling Closed Containers of Radioactive Material"

QS-92-009, "ALARA and Access Control"

The inspector noted that the audits and surveillances reviewed were comprehensive and had good technical content. The audits and surveillances had been performed by personnel that were technically competent in the areas that were reviewed.

No violations or deviations were identified.

Conclusions

Comprehensive, technical audits and surveillances were performed by qualified personnel.

3. EXIT MEETING

The inspector met with the resident inspector and the licensee's representatives denoted in paragraph 1 at the conclusion of the inspection on July 31, 1992, and summarized the scope and findings of the inspection as presented in this report. The licensee did not identify as proprietary any of

the materials provided to, or reviewed by, the inspector during the inspection.