

APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-458/92-13

Operating License(s) No. NPF-47

Licensee: Gulf States Utilities (GSU)
P.O. Box 220
St. Francisville, Louisiana 70775

Facility Name: River Bend Station (RBS)

Inspection At: RBS Site, St. Francisville, Louisiana

Inspection Conducted: April 27 through May 1, 1992

Inspectors: R. E. Baer, Senior Reactor Health Physicist
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5/26/92
Date

Inspection Summary

Inspection Conducted April 27 through May 1, 1992 (Report No. 50-458/92-13)

Areas Inspected: Routine, announced inspection of the radiation protection program including: planning and preparation; organization and management controls; training and qualifications; external and internal exposure control; control of radioactive material and contamination; ALARA; solid waste management; and transportation of radioactive material.

Results: Within the areas inspected, one violation was identified for failure to comply with very high radiation area controls (paragraph 6). No deviations were identified. The following is a summary of the inspection.

- o An ample inventory of protective clothing and equipment was maintained to support the outage. Excellent coordination existed between radiation protection and the other departments.

- o A sufficient number of contract radiation protection personnel were available to support the permanent plant staff during the prolonged, current outage.
- o An exceptional surveillance program had been established for radiation protection, ALARA, and radioactive waste and transportation activities.
- o A very good training program had been maintained for radiation workers and contract radiation protection technicians.
- o A very good external radiation exposure control program was maintained. High and very high radiation areas were posted and controlled properly. One violation was identified involving the failure of a worker to adhere to radiological controls (paragraph 6).
- o A good internal exposure control program was in place. Whole body counting was being performed to verify the effectiveness of the respiration protection program.
- o The licensee was maintaining very good control of posted areas. Radiation surveys were being performed and worker awareness was excellent.
- o An excellent campaign had been initiated to reduce radiation levels in work areas and chemical cleaning was being used in addition to system flushing. ALARA programs have received strong management support.
- o Effective solid radioactive waste management and transportation of radioactive materials programs were maintained.

DETAILS

1. PERSONS CONTACTED

- *J. C. Deddens, Senior Vice President, GSU
- *D. L. Andrews, Director Quality Assurance
- *E. M. Cargill, Director Radiological Programs
- *R. G. Easlick, Supervisor Radwaste
- *C. L. Fantacci, Supervisor Radiological Engineering
- *P. D. Graham, Plant Manager
- *D. N. Lorfing, Supervisor Nuclear Licensing
- *G. Mahan, Engineer, Welding
- *J. H. McQuilter, Engineer Licensing
- *W. H. O'Dell, Manager Oversight
- *S. M. Prudhomme, Licensing Cooperative
- *M. F. Sankovich, Manager, Engineering
- *K. E. Suhrke, General Manager, Engineering and Administration
- *R. J. Vachon, Senior Compliance Analyst, System Engineering.

Others

- *W. L. Curran, Site Representative, Cajun Electric
- *D. P. Loveless, Resident Inspector, NRC
- *L. D. Gilbert, Reactor Inspector, NRC

The inspectors also interviewed several other licensee and contractor personnel in the radiation protection, maintenance, training, and quality assurance departments.

*Denotes those persons that attended the exit interview conducted May 1, 1992.

2. LICENSEE EVENT REPORT (LER) FOLLOWUP (92700)

(Closed) LER 92-006: Unsecured high radiation area.

LER 92-006 was issued after a radiation protection technician discovered on March 14, 1992, an unsecured high radiation area entrance boundary rope at the 95-foot elevation of the reactor building by the drywell equipment hatch. The last individuals, a crew of four workers, exited the area at 6:38 a.m., and the barrier was found in an unsecured manner at 7:15 a.m. There was no evidence that unauthorized individuals had entered the area. All other areas within the drywell were found to have been maintained properly.

The inspectors verified that the licensee had completed the corrective actions as listed in the LER. These actions included:

- o On March 14, 1992, nonessential personnel who were authorized access to the radiologically controlled area were directed to stop work and attend meetings conducted by the plant manager.

- o Additional meetings were conducted by management personnel at the beginning of each shift for 4 consecutive days. The importance of adhering to radiological procedures was emphasized.
- o The practice of using a safety seal on rope barriers at unused entrances, installing self-closing scaffold gates, surveillance with closed-circuit television cameras, and 4-hour barrier checks was initiated.

The inspector considered these actions appropriate for the circumstances.

3. OUTAGE PLANNING AND PREPARATION (83750, 83729)

The inspectors reviewed the advanced planning and preparation for the outage. The inspectors reviewed records and discussed outage planning with licensee representatives. Excellent coordination was evident between the radiation protection department and the other plant departments concerning outage activities. Sufficient protective clothing, instrumentation, temporary lead shielding, and respiratory equipment was maintained to support the outage.

The licensee had a portable high efficiency particulate air filtration unit controlling the atmosphere inside the control rod drive build room. Personnel were not required to wear respiratory protection equipment when working in the room. The licensee wore body counted personnel working in the room, and no detectable uptakes had been identified.

No violations or deviations were identified.

Conclusion

An ample inventory of protective clothing and equipment was maintained to support the outage. Excellent coordination existed between the radiation protection and other departments. Air filtration equipment was used to reduce the need for respiratory protection equipment.

4. ORGANIZATION AND MANAGEMENT CONTROLS (83750, 83729)

The inspectors reviewed the licensee's organization, staffing, and management controls to determine compliance with the requirements in Section 6.2 and 6.5.3.8 of the Technical Specifications (TS) and agreement with the commitments in Chapter 13 of the Updated Safety Analyses Report.

Three vacant radiation protection technician positions existed in the radiation protection department. An offer had been made to an individual to fill one of the three vacant positions.

The licensee had three classifications of radiation protection technicians. These technician classifications (junior, radiation protection, and senior) were defined in Procedure RSP-0003, "Personnel Qualifications for the Radiation Protection Section." A junior technician is an individual enrolled

in the radiation protection training program. After completion of 2 years experience (ANSI N18.1-1977) and the required training classes, the individual would be classified as a radiation protection technician. A senior radiation protection technician must meet the requirements of ANSI/ANS 3.1-1987 which requires 3 years of nuclear power plant experience. During an outage, the licensee utilizes both ANSI/ANS 3.1 and ANSI N18.1 classified senior technicians.

The station radiation protection organization was supplemented with contractor personnel for the outage. Seventy-six senior level technicians were employed which consisted of 57 ANSI/ANS 3.1 - 1987 and 22 ANSI N18.1-1977 qualified individuals, 10 junior level technicians, and 15 "local hires." The local hires assisted the junior technician in their work activities. In addition, 50 decontamination and shielding personnel were also hired for the outage. The inspectors reviewed selected ANSI 3.1 and all ANSI N18.1 classified health physics technicians' resumes and verified these personnel were qualified for the positions they were occupying. The inspectors noted that while some ANSI N18.1 personnel had extensive experience as decontamination technicians, they all had at least 2 additional years experience as junior level radiation protection technicians performing various activities at nuclear power plants.

The inspectors reviewed the quality assurance surveillances performed by quality operations personnel in the area of radiation protection, ALARA and radioactive waste and transportation. These surveillances included:

<u>Number</u>	<u>Name</u>
05-91-09-17	HRA\VHRA Compliance
05-91-10-03	RP Compliance of INPO Suggestions for Improvement
05-91-10-19	Radiological Protection Services
05-92-01-03	Followup on CR-91-01??
05-92-01-04	Radwaste Container Certification
05-92-02-07	Radwaste Activity
05-92-03-02	Radiological Protection Services on HRA\VHRA Compliances
05-92-03-07	HP and Personnel Monitoring
05-92-03-17	ALARA Program
05-92-04-10	Followup on INPO Suggestions
05-92-04-21	Temporary Shielding Control
05-92-04-28	RP Activities

The inspectors found the surveillances to be of good quality and to be comprehensive; they concluded that the surveillances were effective. The surveillances were used as a means for followup on identified program weaknesses and to check areas in which management had determined that additional performance-based observations were needed.

No violations or deviations were identified.

Conclusion

An appropriate number of contractor radiation protection personnel were available for the outage. An exceptionally good surveillance program had been established for radiation protection, ALARA, and radioactive waste and transportation activities.

5. RADIATION PROTECTION TRAINING AND QUALIFICATION (83750, 83729, 86750)

The inspectors reviewed the licensee's training and qualification program to determine compliance with the requirements in Section 6.3 and 6.4 of the Technical Specifications and 10 CFR Part 19.12 and agreement with commitments in Chapter 13.2 of the Updated Safety Analyses Report.

The inspectors reviewed the training provided to radiation workers and contract radiation protection technicians. Radiation workers were provided initial general employee training or site specific refresher training and everyone was issued an outage handbook which, among other things, covered the various River Bend Station control programs such as, chemicals, maintenance and test equipment, security, and radiation protection. The inspectors noted that the radiation worker responsibility section covered high radiation and very high radiation areas only in a general manner. This had been an area of weakness in the past.

Contract radiation protection personnel were brought onsite about 3 weeks prior to the outage, and training was provided on plant procedures. The licensee also retained 15 "Local Hires" in the radiation protection organization. These individuals were tested for their academic ability, provided a 6-week training course on radiation protection technology conducted by a radiation protection technician contractor (the course agenda was approved by River Bend Training Department), and a 3-week on-the-job training program.

No violations or deviations were identified.

Conclusion

A very good training program had been maintained for radiation workers and contract health physics technicians.

6. EXTERNAL EXPOSURE CONTROL (83750, 83728, 83729)

The inspectors reviewed the licensee's external exposure control program to determine compliance with 10 CFR Parts 20.101, 20.102, 20.202, 20.401, and 20.403 and agreement with commitments in Section 12 of the Updated Safety Analysis Report.

The inspectors verified the licensee had received accreditation by the National Voluntary Laboratory Accreditation Program (through July 1, 1992) in all eight test categories for their thermoluminescent dosimeter (TLD) program. The inspectors' review also verified that the licensee had maintained an

acceptable program. The licensee routinely processes TLD badges on a quarterly basis during normal operation. During the current outage, the TLD badges were processed on a monthly schedule. Pocket dosimeters were used both as a secondary dosimeter program and to monitor and track exposure results of individuals between TLD badge processing.

The inspectors discussed with licensee representatives the methodology used for determining exposure results and documentation from "hot particles." The licensee implemented Procedure RHP-0030, "Calculation of Dose from Skin Contamination," as their controlling document. The inspectors determined the licensee had performed dose calculations for all 31 skin exposures. The skin exposures ranged from 3 millirem to 5957 millirem for those exposures which had occurred since January 1, 1992; 11 exposures had exceeded the 50 millirem threshold the licensee had established and were recorded on the individuals' exposure history record. The inspectors determined that the radionuclides identified were primarily ruthenium-106, rhodium-106, cobalt-60, and cesium-137. It was noted that on one occasion cerium-144 was identified and used to calculate the skin exposure. Discussion with the licensee indicated that the daughter radioisotope of cerium-144, praseodymium-144, had not been accounted for in the skin exposure calculation. The licensee stated they plan to review this calculation.

The licensee had experienced approximately 120 personnel contamination reports between February 25 and May 1, 1992. These contaminations involved both skin and clothing. The clothing contaminations represented over 60 percent of the contamination events recorded. The inspectors reviewed the 21 personnel contamination reports that were documented for work performed in the radiologically controlled area on Radiation Work Permit 92-0001. The radiation work permit was for general access and did not allow access into high radiation areas, airborne radioactivity areas, or contaminated areas. The inspectors determined a large percentage of these personnel contamination reports were attributed to poor work practices by the individual who became contaminated.

The inspectors made several tours of the auxiliary building, turbine building, radwaste building, and reactor drywell. Independent radiation measurements performed by the inspectors confirmed that designated areas within the radiologically controlled area were posted properly. The inspectors also verified that high radiation areas afforded an adequate level of protection to workers and that very high radiation areas were maintained locked.

The inspectors reviewed selected radiation exposure histories for contractor personnel. It was noted, in one case, that an individual had signed the Form NRC-4 equivalent without entering his prior exposure history for the current calendar quarter, because he did not know his actual exposure. The individual believed his actual exposure to be somewhere between 1 and 2 rem. At a later date, some unknown individual had entered "0" in the blanks. A followup review of the individual's exposure history revealed that he had received an exposure of 1.8 rem during the quarter. The inspectors cautioned the licensee that the individual who signs the form is held responsible that

the information is correct and when conflicting data are depicted, the appearance of wrongdoing may be present.

Technical Specification 6.12.1 requires that radiation areas greater than 1000 mrem per hour be controlled with a radiation work permit that specifies dose rate levels in the immediate work area and the maximum allowable stay time for individuals. In addition, personnel allowed access shall have one or more of the following:

- o A radiation monitoring device which continuously indicates the radiation dose rate in the area.
- o A radiation monitoring device which continuously integrates the radiation dose rate in the area and alarms when a preset integrated dose is received.
- o Positive control is exercised by an individual qualified in radiation protection procedures with a radiation dose rate monitoring device.

On April 30, 1992, at approximately 3:15 a.m., the licensee observed a contract worker inside a posted very high radiation boundary at the auxiliary building, 141-foot elevation, main steam tunnel plug. The individual was observed through a remote close-circuit television camera which had been setup to observe the area and was monitored at the auxiliary building, 95-foot elevation control point. A radiation protection technician was dispatched to the main steam tunnel plug area and removed the individual from the posted very high radiation area. It was determined the individual did not have a stay time record sheet or an integrating radiation monitoring device. This event was documented in Condition Report 92-0313. The entry into a very high radiation area without the required radiation protection controls and equipment is a violation of Technical Specification 6.12.2 (458/9213-01).

The inspectors' analysis of the event consisted of data reviews, observations in the auxiliary building main steam tunnel plug area, and interviews with personnel and their supervisors involved in the event. The licensee was still evaluating the data and had not determined the root cause. The individual's pocket dosimeter exposure record indicated 62 millirem for the month. His TLD was pulled and processed and indicated an exposure of 82 millirem for the month.

The inspectors interviewed the individual and determined that he knew exactly what the radiation intensity was where he was working and where the very high radiation level was. It would have been necessary for him to climb down into the main steam tunnel to be in the very high radiation levels. There was no substantial potential for the individual to receive a radiation exposure in excess of 10 CFR Part 20 limits.

The inspectors noted that the licensee's radiation protection department responded correctly once they were aware that the worker had entered the high radiation area. Furthermore, the licensee's actions satisfied some of the

criteria in Section VII.B.2 of the Enforcement Policy for noncited violations. However, the licensee had experienced several problems within the past two years regarding the control of high radiation areas. These problems were discussed in NRC Inspection Reports 50-458/90-30 and 50-458/91-13 and involved significant enforcement action. Accordingly, this is a violation (50-458/9213-01), because past corrective actions were apparently not completely effective.

Conclusion

A licensee-identified violation was reviewed involving a contract worker who violated established radiological procedures. The external radiation exposure control program was being maintained at a very good level. The high radiation and very high radiation areas were posted and controlled properly.

7. INTERNAL EXPOSURE CONTROL (83750, 83728, 83729)

The inspectors reviewed the licensee's program for control of internal radiation exposure to determine compliance with the requirements of 10 CFR Part 20.103 and agreement with commitments in Section 12 of the Updated Safety Analyses Report.

The inspectors reviewed the airborne radioactivity sampling program results and observed airborne radioactivity sampling in the radiologically controlled area. The inspectors verified that air sampling had been performed in accordance with station procedure developed to meet the requirements of 10 CFR Part 20.103 and to support the respiratory protection program.

The inspectors verified the licensee had maintained the respiratory protection program as originally documented and that only approved respiratory devices were being used. The licensee tracked the wearing of respirators and work in areas with detectable airborne radioactivity on a maximum permissible concentration hour (mpc-hr) log. No problems were identified in this area.

The inspectors reviewed and observed the licensee's whole body counting and bioassay program. The licensee requires personnel who work in the radiologically controlled area to receive a whole body count prior to the issuance of a TLD and after completion of their work assignment. Personnel who wear respirators were whole body counted along with selected individuals that performed work in areas utilizing air cleaning systems in lieu of respiratory protective equipment to detect any uptakes of radioactive material.

No violations or deviations were identified.

Conclusion

A good internal exposure control program was in place. Whole body counting was being performed to verify the effectiveness of the respiration protection program.

8. CONTROLS OF RADIOACTIVE MATERIALS AND CONTAMINATION, SURVEYS, AND MONITORING (83750, 83729)

The inspectors reviewed the licensee's program for surveying, monitoring, and controlling radioactive materials to determine compliance with the requirements of Technical Specifications 6.11 and 6.12 and 10 CFR Parts 19.12, 20.201, 20.203, 20.208, 20.207, 20.301, and 20.401.

The inspectors made several tours of the radiologically controlled area. It was noted that general housekeeping appeared to be very good and that contaminated areas did not appear to have excessive quantities of waste material present. The inspectors reviewed postings (warning signs, rope barriers, and step-off pads), controls of contaminated areas, high and very high radiation areas, and noted they were well maintained. At the exits from the radiologically controlled areas, the licensee used tool monitors and friskers with surveying items. The licensee was aware of the limitations of these instruments for detecting electron-capture radionuclides. The licensee had evaluated samples of contamination which were characterized for these radionuclides. Low levels of electron-capture radionuclides were present which were correlated to easily detectable radionuclides. Both a high sensitivity personnel contamination monitor and portal monitor were used by personnel exiting at control points. A final portal monitor was located at the security building.

The inspectors reviewed selected radiation survey records and verified that radiological monitoring activities were being performed as required. The inspectors reviewed radiation work permits and discussed the requirements with radiation workers. These workers appeared to know the limitations of the work they could perform and the current radiological conditions in the work area.

The inspectors verified that an adequate supply of calibrated and daily response tested radiation survey instruments were available.

The inspectors discussed with licensee representatives the recovery actions that were undertaken to secure the southeast wall of the turbine building were approximately 2730 square feet of 1.5-inch thick fiberglass insulation containing trace amounts (microcurie quantities) of cesium-137, cobalt-60, and iodine-133 had been torn off the building on March 5, 1992, by high winds. The licensee estimated that about 90 percent of the insulation was contained within the protected area fence line, the other 10 percent was located in the owner-controlled area. The licensee recovered all the insulation by March 8, 1992. Samples of soil from under the rain soaked insulation and sediment samples from the creek that collects the rain runoff were taken; no cobalt-60 was detected. Trace quantities of cesium-137 had been found routinely since shortly after the Chernobyl accident. There was not an increase over the previously detected levels. The licensee had reacted correctly during this incident.

No violations or deviations were identified.

Conclusion

The licensee was maintaining very good control of posted areas. Radiation surveys were being performed and worker awareness was excellent. The licensee performed in response to an incident caused by severe weather.

9. MAINTAINING OCCUPATION EXPOSURES ALARA (83728, 83750)

The inspectors reviewed the licensee's ALARA program to determine compliance with 10 CFR Part 20.1(c) and agreement with the recommendations of Regulatory Guides 8.8 and 8.10.

The inspectors reviewed the licensee's 1991 ALARA results and 1992 goals. In 1991, 127 person-rem were expended compared to the annual goal of 110 person-rem. Out-of-scope work contributed to the increased exposures. This included 8.5 person-rem for cleaning the main condenser water boxes, 10 person-rem on the reactor water cleanup pump seal problems, and 8 person-rem on the ultrasonic resin cleaner system. The goal for 1992 is 570 person-rem with 500 person-rem expected to be expended during the current outage.

The inspectors reviewed several ALARA initiatives scheduled to be implemented during the outage. The licensee plans a decontamination factor of at least seven from the chemical decontamination of the reactor recirculation and reactor water cleanup systems. The licensee plans to repack between 1200 to 1300 valves to reduce the fission gas problems that has been a problem this past year. The reactor water cleanup ring header will be replaced during the outage. Ring header nozzles had been flushed, most were originally around 10 rem per hour, and the radiation intensity was reduced to between 1 and 2.5 rem per hour. Hot spots in line and other work areas were the target for a major dose reduction campaign.

The ALARA group had been expanded from three to five individuals during the outage. In general, management had provided strong support for ALARA activities.

No violations or deviations were identified.

Conclusion

An excellent campaign had been initiated to reduce radiation levels in work areas and chemical cleaning was being used in addition to system flushing. The ALARA programs have received strong management support.

10. SOLID RADIOACTIVE WASTE MANAGEMENT AND TRANSPORTATION OF RADIOACTIVE MATERIALS (86750)

The inspectors reviewed the licensee's solid radioactive waste management and transportation of radioactive materials program to determine whether these programs met applicable regulatory requirements.

10.1 Changes to the Program

The inspectors reviewed changes that had been made since the last inspection in organization, facilities, equipment, program, and procedures that may affect the solid radioactive waste management and transportation of radioactive material programs.

The licensee had not made any major changes to these programs. The "Radman" computer program had been installed to assist in meeting 10 CFR Part 61 requirements.

10.2 Training and Qualification of Personnel

The inspectors reviewed the licensee's training and qualification program for personnel involved in the solid radioactive waste and radioactive materials transportation activities to determine agreement with commitments in Chapter 13 of the Updated Safety Analysis Report and the licensee's response to NRC Bulletin 79-19 and compliance with Section 6.3 and 6.4 of the Technical Specifications.

A vendor had been hired to provide a "regulatory awareness" training session on an annual basis to update personnel of regulatory changes and burial site requirements that have been made or are pending. The vendor presented three classes which were attended by approximately 30 people. The inspectors determined that personnel responsible for solid radwaste and transportation activities were knowledgeable of the applicable NRC, Department of Transportation, and burial site license conditions.

10.3 Solid Radwaste Management

The inspectors reviewed the licensee's solid radioactive waste program to determine agreement with commitments in Chapter 11 of the Updated Safety Analysis Report and compliance with the requirements of Section 3/4.11.3, 6.13, and 6.15 of the Technical Specifications.

The inspectors noted the licensee used two methods to dispose of dry active waste. One method was to place the dry active waste into a sea-land container and ship it offsite to a vendor who would segregate and incinerate for volume reduction. The second method uses the licensee's compactor which is used to compact dry active waste into 55 gallon metal drums. These drums are shipped offsite to a vendor who then further reduces the volume approximately 2.1 times by super compaction.

The licensee was in the process of reviewing the design for an interim onsite storage facility for radioactive waste materials.

10.4 Radioactive Waste Classification, Waste Characterization, and Shipping Requirements

The inspectors reviewed the licensee's program for the control, classification, characterization, and shipment of low-level radioactive waste

and disposal site license conditions to determine compliance with the requirements of 10 CFR Parts 20.311, 61.55, and 61.56, and the recommendations of NRC Branch Technical Position, Revision 1, "Papers on Low-Level Radioactive Waste Classification and Waste Form."

The inspectors determined the licensee had made three shipments to a vendor during the first quarter of calendar year 1992 of samples from specific waste streams for special analyses to determine scaling factors for those radionuclides which the licensee was not capable of measuring.

The inspectors reviewed approximately 30 selected radioactive waste shipping manifest forms and shipping papers that accompany each shipment of radioactive waste and determined that the shipping manifest appeared to satisfy the requirements of 10 CFR Part 20.311.

No violations or deviations were identified.

Conclusion

Effective solid radioactive waste management and transportation of radioactive materials programs were maintained.

11. EXIT MEETING

The inspectors met with licensee representative denoted in paragraph 1 at the conclusion of the inspection on May 1, 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 inspectors during this inspection.