

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-416  
License No.: NPF-29  
Report No.: 50-416/97-10  
Licensee: Entergy Operations, Inc.  
Facility: Grand Gulf Nuclear Station  
Location: Waterloo Road  
Port Gibson, Mississippi  
Dates: June 2-5, 1997  
Inspectors: J. Blair Nicholas, Ph.D.  
Senior Radiation Specialist  
  
Gilbert L. Guerra  
Radiation Specialist  
  
Headquarters Support: Stephen P. Klementowicz  
Health Physicist, Office of Nuclear Reactor Regulation  
Approved By: Blaine Murray, Chief  
Plant Support Branch

ATTACHMENTS:

Attachment 1: Supplemental Information  
Attachment 2: Summary of Annual Radioactive Effluent Release Report Data

## EXECUTIVE SUMMARY

### Grand Gulf Nuclear Station NRC Inspection Report 50-416/97-10

#### Plant Support

- The liquid and gaseous radioactive waste effluent management programs were effectively implemented. Offsite doses to the environment from the liquid and gaseous radioactive waste effluents were within regulatory limits (Section R1.1).
- Although reductions have occurred during the past 2 years, with significant reductions for the first 6 months of 1997, the licensee has historically released higher than the boiling water reactor industry's average volumes of liquid radioactive waste. The tritium activity released annually was the highest in the industry for boiling water reactors (Section R1.1).
- The engineered-safety feature air cleaning ventilation systems were properly maintained and tested (Section R1.2).
- The radiological environmental monitoring program was effectively implemented (Section R1.3).
- A commitment was made to re-instate the sampling of fish media at a reduced frequency of annually (Section R1.3).
- An effective meteorological monitoring program was implemented (Section R1.4).
- The radiochemistry counting room analytical instrumentation was properly maintained, tested, and calibrated (Section R2.1).
- Liquid and gaseous radioactive waste management systems were installed and operated properly (Section R2.1).
- Liquid and gaseous effluent radiation monitoring instrumentation was operable and properly maintained, tested, and calibrated (Section R2.2).
- Environmental sampling stations were properly maintained with operable and calibrated equipment (Section R2.3).
- The meteorological towers were properly maintained with calibrated instrumentation. Meteorological data recovery was greater than 90 percent (Section R2.4).

- Revisions to the offsite dose calculation manual were properly documented. Program implementing procedures were maintained and contained sufficient detail (Section R3.1).
- Annual radioactive effluent release reports and annual radiological environmental operating reports for 1995 and 1996 were submitted in a timely manner and contained the required information (Section R3.2).
- Chemistry personnel had an excellent understanding of the radioactive liquid and gaseous waste effluent management program, radiological environmental monitoring program, offsite dose calculation manual, and regulatory requirements (Section R4).
- Training and qualification programs for senior radiochemists, chemistry specialists, and radwaste operators were properly implemented. A trained and qualified staff for conducting radioactive waste effluent processing, effluent release operations, radiological environmental monitoring program activities was maintained (Section R5).
- In the past 1 ½ years, the chemistry department experienced approximately a 20 percent staff reduction including the two current vacancies. The radwaste operations staff changed very little (Section R6).
- Oversight of the radioactive waste effluent management program and the radiological environmental monitoring program was good. The quality assurance audit and surveillance reports of the radiological waste effluent management program and radiological environmental monitoring program activities were technically comprehensive and provided good program evaluation (Section R7.1).
- There was appropriate evaluation of the contractors' performance (Section R7.2).

## Report Details

### Summary of Plant Status

The unit was at power operations during the inspection. There were no operational occurrences that impacted the results of the inspection.

## IV. Plant Support

### **R1 Radiological Protection and Chemistry Controls**

#### **R1.1 Radiological Waste Effluent Management Programs**

##### **a. Inspection Scope (84750)**

Implementation of the radioactive waste effluent management program, as described in the offsite dose calculation manual and the technical requirements manual, was reviewed. This review included: Radioactive effluent waste processing; radioactive effluent waste sampling and analyses, analytical sensitivities and results, offsite dose results, and performance of required surveillance tests. The following activities were observed:

- Collection of the weekly air particulate filters and charcoal cartridges from the offgas/radwaste building vent, turbine building vent, containment building vent, and fuel handling building vent on June 3, 1997, and performance of radiochemistry analyses (principal gamma emitters) of the samples.
- Collection of the monthly tritium and noble gas samples from the radwaste building vent on June 4, 1997, and the performance of the required surveillance testing analyses to monitor the continuous effluent release point.
- Updating of the chemistry department's computer data base with the current monthly and quarterly composite sample analytical data for liquid and gaseous effluents.

##### **b. Observations and Findings**

The inspectors noted that during the performance of the observed activities the responsible chemistry personnel referred to and followed the appropriate sampling and analytical procedures while performing the sample collections and analyses. The required sampling, testing, approvals, and release controls for the liquid and gaseous effluent sample collections and analyses were performed in accordance with technical requirements manual and offsite dose calculation manual requirements.

Based on the review of six batch liquid radioactive waste effluent release permits and selected gaseous radioactive waste effluent sample analyses for samples from the four continuous ventilation release points for the period January 1996 through May 1997, the inspectors verified that the processing, sampling, analyses, and monitoring of the batch liquid radioactive waste effluents and the continuous discharges of the radioactive gaseous waste effluents were conducted properly. Quantities of radionuclides released were within the limits specified in the offsite dose calculation manual. Offsite doses were calculated according to offsite dose calculation manual methodologies and were within regulatory limits. Required analyses of monthly and quarterly composite samples of liquid and gaseous radioactive waste effluents were performed in accordance with offsite dose calculation manual requirements.

In recent years, the licensee released higher than the boiling water reactor industry's average volumes of liquid radioactive waste, and during 1993 through 1996, the licensee's release volume of liquid radioactive waste was the highest for boiling water reactors nationally. However, the inspectors noted that during the past 2 years the licensee had reduced the number of liquid batch releases and the liquid effluent volume released from the plant. The liquid effluent data for the first 6 months of 1997 showed a significant decrease in the volume of liquid radioactive waste released.

During 1993 through 1996, the tritium activity levels increased due to increased boron concentration in the reactor water as a result of stress corrosion cracking of the control blade absorber tubes. Tritium activity increases based on control blade depletion reached a maximum in 1996. Control blade replacement is scheduled for future refueling outages with the expectation that the tritium activity released will decrease in the liquid and gaseous radioactive waste releases. The licensee's tritium activity released annually has been the worst in the industry for boiling water reactors. The control blade degradation had also affected, to a minor extent, an increase in fission and activation products in both the liquid and gaseous radioactive waste effluents as shown in Attachment 2. However, the summary of dose data in Attachment 2 shows that the annual doses from liquid and gaseous radioactive effluents was not significantly affected by the increased tritium, fission, and activation product activity.

c. Conclusions

The liquid and gaseous radioactive waste effluent management programs were effectively implemented. Proper sample handling techniques were used by the licensee while collecting and handling samples. Quantities of radionuclides released in the liquid and gaseous radioactive waste effluents were within the offsite dose calculation manual limits. Offsite doses to the environment from the liquid and



gaseous radioactive waste effluents were calculated using offsite dose calculation manual methodologies. Although reductions have occurred during the past 2 years, with significant reductions for the first 6 months of 1997, the licensee has historically released higher than the boiling water reactor industry's average volumes of liquid radioactive waste. The tritium activity released annually was the highest in the industry for boiling water reactors.

R1.2 Engineered-Safety Feature Air Cleaning and Control Room Habitability Systems

a. Inspection Scope (84750)

Selected surveillance tests and test results for the engineered-safety feature air cleaning ventilation systems' testing program were reviewed to determine compliance with the requirements in Technical Specifications 3.6.4.3 and 3.7.3 and the station's ventilation filter testing program in Technical Specification 5.5.7.

b. Observations and Findings

The engineered-safety feature air cleaning ventilation systems contained high efficiency particulate air filters and activated charcoal adsorbers.

The inspectors performed a visual inspection with the system engineer of the standby gas treatment system and the control room fresh air system. The visual inspection of the filtration systems did not identify any problems. No external damage to the filtration units was identified. All filter housings and ducts were well maintained. The areas surrounding the filtration units were clean, free of debris, and the filtration units were adequately lighted inside and outside to provide for visual inspection of housings and components.

The surveillance testing program included the required periodic functional checking of the ventilation systems' components, evaluation of the high efficiency particulate air filters and activated charcoal adsorbers, and in-place filter testing of the high efficiency particulate air filters and charcoal systems. Since some of the surveillance tests were only required to be performed every 18-months, the inspectors reviewed the last completed surveillance test and verified that the previous two surveillance tests were performed as required at the 18-month frequency. Selected records and results of surveillance tests for the period January 1996 through May 1997 for the standby gas treatment system (Trains A and B) and the control room fresh air system (Trains A and B) verified that the required surveillance tests were performed. The activated charcoal efficiency tests were properly performed by an offsite contract laboratory. All surveillance test results were verified to be within Technical Specification limits.

The Technical Specification requirement for testing the air cleaning ventilation systems' activated charcoal adsorber material after every 720 hours of operation following the previous laboratory testing was tracked by the control room and the system engineer.

c. Conclusions

The engineered-safety feature air cleaning ventilation systems' surveillance program was properly implemented. All surveillance test results met Technical Specification requirements.

R1.3 Radiological Environmental Monitoring Program

a. Inspection Scope (84750)

The inspectors reviewed the radiological environmental monitoring program to determine compliance with the requirements in the offsite dose calculation manual. The inspectors reviewed in detail the reductions to the radiological environmental monitoring program implemented in July 1996.

b. Observations and Findings

The inspectors visited selected environmental media sampling locations associated with the radiological environmental monitoring program. The following types of sampling locations were inspected: airborne, surface water, and vegetation. The inspectors verified that the environmental sampling stations were located as required in the offsite dose calculation manual. Also, the inspectors accompanied and observed an environmental specialist collect air particulate and charcoal cartridge samples for shipment and analysis. All sample analyses for the radiological environmental monitoring program were performed by the offsite Entergy System's environmental laboratory. The collection, processing, and analytical requirements for radiological environmental media samples were conducted in accordance with the offsite dose calculation manual.

Changes to the radiological environmental monitoring program were made and the offsite dose calculation manual was revised accordingly. Several of the environmental media sample types were reduced both in number of samples and in the frequency of sampling. The inspectors found that the licensee reduced the radiological environmental monitoring program in general agreement with regulatory guidance. Regulatory Guide 4.1, "Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants," Revision 1, April 1975, provides guidance acceptable to the NRC staff. This regulatory guide states, "... if the licensee is able to demonstrate from levels in environmental media or calculations that the doses and concentrations associated with a particular pathway are sufficiently

small, the number of media sampled in the pathway and the frequency of sampling may be reduced. An adequate program with emphasis on indicator organisms and selected media should still be continued in order to confirm that the levels of radioactivity in environmental media remain small."

The inspectors reviewed all changes to the radiological environmental monitoring program. The inspectors noted that the requirement for sampling fish media was removed from the radiological environmental monitoring program. Specifically, the requirement for sampling fish media was removed based on historical analytical data and the rationale that fish are not confined to and do not congregate in the discharge area as stated in the licensee's evaluation.

The inspectors noted that the bases documented in the licensee's Technical Requirements Manual, Section 7.6.3.2, for the radiological environmental monitoring program states that a program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. Also, the licensee stated in their annual radioactive effluent release reports that the maximum dose contribution from liquid effluents was considered to occur in the adult age group via consumption of fish. Based on the above information, the inspectors determined that the reasons for the elimination of the environmental fish sample media was inappropriate in that an evaluation was not performed to establish a technical basis for eliminating the fish sample.

The inspectors noted that fish samples were collected in June 1996, and June 1997. Therefore, the intervals between samples did not exceed one year.

During the inspection, the inspectors received a commitment from the chemistry superintendent that the licensee would re-instate sampling of the fish media at the reduced frequency of annually. This commitment was confirmed during the exit meeting on June 5, 1997.

c. Conclusions

The radiological environmental monitoring program was effectively implemented. Reductions to the environmental monitoring program were made in accordance with NRC guidance. A commitment was made to re-instate the sampling of fish media at a reduced frequency of annually.



#### R1.4 Meteorological Monitoring Program

##### a. Inspection Scope (84750)

The inspectors reviewed the meteorological monitoring program to determine agreement with the recommendations of NRC Regulatory Guides 1.23 and 1.97, and compliance with Technical Requirements Manual, Section 6.3.3. Meteorological data collection and data review procedures were reviewed, and the data were discussed with licensee personnel.

##### b. Observations and Findings

The licensee utilized two meteorological towers equipped with the required instrumentation. The instrumentation was in agreement with the guidance in Regulatory Guide 1.23. Data from the meteorological instrumentation were collected by the plant computer and displays of the meteorological data were available to operations personnel and at the emergency facilities. Licensee procedures for the review and verification of meteorological data were maintained.

##### c. Conclusions

An effective meteorological monitoring program was implemented. A proper meteorological data collection and review program was established. The performance of the meteorological monitoring program agreed with regulatory guidance.

#### R2 **Status of Radiological Protection and Chemistry Facilities and Equipment**

##### R2.1 Radiochemistry Counting Room and Radioactive Waste Effluent Processing System

##### a. Inspection Scope (84750)

The inspectors observed analytical measurements of radiological effluent samples performed in the radiochemistry counting room. The radioactive liquid and gaseous waste processing equipment were inspected. Equipment inspected in the radwaste building included the equipment drain waste collection tank, floor drain waste collection tank, the liquid radioactive waste processing equipment, and the gaseous radioactive waste processing equipment.

##### b. Observations and Findings

The radiochemistry counting room maintained sufficient state-of-the-art analytical instrumentation to perform the required sample analyses of the liquid and gaseous radioactive waste effluents. The instrumentation was properly calibrated and well maintained. Records of calibrations and daily operational quality control checks

were maintained. Senior radiochemists assigned to the radiochemistry counting room were knowledgeable on the use of the instrumentation.

The liquid radioactive waste processing and storage systems were installed as described in the Updated Final Safety Analysis Report and were operated in accordance with station procedures.

The gaseous radioactive waste processing system was installed as described in the Updated Final Safety Analysis Report and was operated in accordance with station procedures.

No major equipment or design modifications were made to the liquid or gaseous radioactive waste effluent management systems.

c. Conclusions

The radiochemistry counting room analytical instrumentation was properly maintained, tested, and calibrated. Liquid and gaseous radioactive waste management systems were installed and operated properly.

R2.2 Liquid and Gaseous Effluent Radiation Monitors

a. Inspection Scope (84750)

The liquid and gaseous effluent radiation monitors were inspected for operation, calibration, and reliability. The liquid and gaseous radioactive waste effluent radiation monitor source check, channel check, channel functional test, and channel calibration records were reviewed to determine compliance with Technical Requirements Manual, Sections 6.3.9 and 6.3.10, and the Offsite Dose Calculation Manual, Tables 6.3.9-1 and 6.3.10-1.

b. Observations and Findings

All surveillance test records reviewed for the period January 1996 through May 1997 indicated that the liquid and gaseous radioactive waste effluent monitoring instrumentation were properly maintained, tested, and calibrated in compliance with the surveillance requirements specified in the technical requirements manual and offsite dose calculation manual.

c. Conclusion

Liquid and gaseous effluent radiation monitoring instrumentation was operable and properly maintained, tested, and calibrated.

### R2.3 Environmental Monitoring Equipment and Facilities

#### a. Inspection Scope (84750)

The inspectors visited selected environmental sampling stations to verify that stations were properly maintained and equipment was operable and properly calibrated. Sample preparation and storage facilities were inspected to verify that sufficient supplies and spare equipment were available.

#### b. Observations and Findings

Air sampling equipment in use was operational and properly calibrated. The environmental specialists were responsible for the calibration of the air samplers.

The environmental sample storage and shipment preparation facility was stocked with the necessary equipment and supplies to perform the required radiological environmental monitoring program sampling activities and the preparation of the environmental samples for shipment to the offsite environmental laboratory. The inspector determined that environmental samples were properly prepared for shipment to the offsite environmental laboratory for analyses.

#### c. Conclusions

Sufficient supplies and spare environmental sampling equipment to perform the environmental sampling activities required in the offsite dose calculation manual were maintained. Environmental sampling stations were properly maintained with operable and calibrated equipment.

### R2.4 Meteorological Monitoring Equipment (84750)

#### a. Inspection Scope

The inspectors inspected the meteorological instrumentation at the meteorological towers and reviewed the associated calibration records to ensure that the meteorological instrumentation on the towers was operable, calibrated, and maintained in accordance with written procedures and the guidance in Regulatory Guide 1.23. Selected meteorological monitoring instrumentation calibration procedures and associated records were reviewed.

#### b. Observations and Findings

The instrumentation at the two meteorological towers was operational and properly calibrated. The meteorological sensing and recording equipment was calibrated semiannually by the licensee's instrument and controls technicians. The calibrations were conducted in accordance with approved procedures for wind speed, wind direction, and air temperature difference. The primary meteorological tower was

equipped with dual instrumentation (Channels A and B) for wind speed, wind direction, and temperature sensing instrumentation at the 10 and 50 meter elevations. Also, the licensee maintained a secondary meteorological tower with wind speed, wind direction, and temperature sensing instrumentation at a 10 meter elevation. Backup power to the towers was provided by batteries and an electrical generator. Meteorological data was available in the control room and emergency response facilities via the plant computer. All records reviewed indicated that the meteorological monitoring instruments were properly maintained, tested, and calibrated at required frequencies.

The licensee had obtained greater than 90 percent meteorological data recovery during the period January 1996 through May 1997.

c. Conclusions

The meteorological towers were properly maintained with all instrumentation calibrated at the required frequency. Meteorological data recovery was greater than 90 percent.

**R3 Radiological Protection and Chemistry Procedures and Documentation**

**R3.1 Changes to the Offsite Dose Calculation Manual and Procedures**

a. Inspection Scope (84750)

Revisions to the offsite dose calculation manual were reviewed for any changes to the radioactive waste effluent management program, radiological environmental monitoring program, and the radwaste system design and operation, including the performance of proper 10 CFR 50.59 reviews, and changes to the implementing procedures regarding the radioactive waste effluent management program and the radiological environmental monitoring program.

Procedures for the sampling, analysis, and release of radioactive liquid and gaseous waste effluents and procedures for the collection and processing of environmental media samples were reviewed.

b. Observations and Findings

Revisions 17, 18, 19, and 20 to the offsite dose calculation manual were issued since the last NRC inspection conducted in January 1996. The revisions implemented changes resulting from the Improved Technical Specifications which incorporated updated meteorological parameters used in calculation of gaseous effluent doses and noble gas setpoints, added the reverse osmosis system equipment to the liquid radwaste treatment system diagram, added a table showing

deposition constants at the nearest residence in each meteorological sector, modified the sampling requirements for an inoperable offgas pretreatment radiation monitor, sampling and analyses reductions affecting the radiological environmental monitoring program. The results of the changes to the radiological environmental monitoring program are discussed in Section R1.3.

The radioactive waste effluent management program's implementing procedures described the responsibilities for collection and analyses of liquid and gaseous radioactive waste effluent samples. Procedures for batch release of liquid radioactive waste effluents provided proper guidance regarding sampling, tank recirculation, analyses, release limits, monitoring, and approvals. The procedures were written with sufficient detail to effectively conduct the required radioactive waste management program activities. The inspectors reviewed the sample collection procedures and identified no concerns.

c. Conclusions

Revisions to the offsite dose calculation manual were properly documented. Program implementing procedures were maintained and contained sufficient detail.

R3.2 Annual Reports

a. Inspection Scope (84750)

The inspectors reviewed the annual reports for 1995 and 1996 concerning the radiological effluent management program and the radiological environmental monitoring program activities to determine compliance with the requirements of Technical Specifications 5.6.2 and 5.6.3 and the offsite dose calculation manual. These documents were reviewed for omissions, obvious mistakes, anomalous measurements, observed biases, trends in the data, and laboratory inter-comparisons.

b. Observations and Findings

The annual radioactive effluent release reports for 1995 and 1996 were written in the format described in NRC Regulatory Guide 1.21, Revision 1, June 1974, and contained the required information. Summaries of the quantities of radioactive liquid and gaseous effluents released to the environment, and their associated doses to members of the public were properly documented in the reports. A summary of the radioactive liquid and gaseous effluent releases and associated doses is presented in Attachment 2 to this report.

The annual reports documented changes to the offsite dose calculation manual as required.



Effluent monitoring instrumentation was not out of service in excess of Technical Specification requirements during the time period reviewed.

During 1995 and 1996 seven unplanned gaseous releases occurred via the turbine building smoke exhaust hatches and were properly documented in the annual radioactive effluent release reports. Each of the unplanned releases was evaluated as a ground level release and included in the gaseous effluent release data from the plant. The inspectors noted that the unplanned gaseous releases had no significant effect on the total gaseous effluents released from the plant.

Sample results, included in the 1995 and 1996 annual radiological environmental operating reports, indicated that environmental media sampling and analyses were performed as required. Discrepancies or missed samples were reported as required. The inspectors noted that sampling, analyses, and reporting requirements were met. The annual land use censuses were conducted as required, and the results were included in the annual reports.

c. Conclusions

Annual radioactive effluent release reports and annual radiological environmental operating reports for 1995 and 1996 were submitted in a timely manner and contained the required information.

**R4 Staff Knowledge and Performance**

a. Inspection Scope (84750)

Personnel in the chemistry department were observed and interviewed to determine their knowledge of regulatory and offsite dose calculation manual requirements regarding the implementation of the liquid and gaseous radioactive waste management program and the radiological environmental monitoring program.

b. Observations and Findings

The inspectors observed senior radiochemists perform some of their duties and responsibilities in the implementation of the radioactive waste effluents program and determined that they were familiar with the requirements of the radioactive waste management program. Chemistry personnel including supervisors and technical staff were knowledgeable of the programmatic procedures, offsite dose calculation manual requirements, and regulatory requirements and maintained a high level of performance. Batch radioactive liquid waste effluent releases and continuous radioactive gaseous waste effluent releases were properly performed during the period January 1996 through May 1997.

The inspectors noted that good practices were used by the environmental specialists in maintaining sample integrity. All activities observed were conducted in an orderly fashion. The inspectors noted that the licensee's staff knowledge of sampling procedures, offsite dose calculation manual, and NRC requirements was excellent.

c. Conclusions

Chemistry personnel had an excellent understanding of the radioactive liquid and gaseous waste effluent management program, radiological environmental monitoring program, offsite dose calculation manual, and regulatory requirements.

**R5 Staff Training and Qualification**

a. Inspection Scope (84750)

Training and qualification programs for senior radiochemists and radwaste operators responsible for implementing the radioactive waste effluents management program were reviewed.

Training and qualifications of senior radiochemists and radwaste operators were verified.

The training and qualification program for the chemistry specialists responsible for implementing the radiological environmental monitoring program were reviewed.

b. Observations and Findings

The training and qualification programs for radwaste operators and chemistry technical staff included required formal classroom training and on-the-job training. The inspectors determined that proper training and qualification programs were implemented for the radwaste operators and the chemistry technical staff.

Nine senior radiochemists had completed the required training to be qualified to perform all radioactive waste effluent management program activities, and three chemistry specialists were trained and qualified to perform all radiological environmental monitoring program activities.

Completed qualification cards documented that nine radwaste operators were trained and qualified.

c. Conclusions

Training and qualification programs for senior radiochemists, chemistry specialists, and radwaste operators were properly implemented. The experience, training, and working knowledge of the chemistry department and the operations department personnel met the training and qualification requirements for conducting radioactive waste liquid and gaseous effluent processing and release operations and environmental monitoring activities.

**R6 Radiological Protection and Chemistry Organization and Administration**

a. Inspection Scope (84750)

Organization, staffing, and lines of authority of the chemistry and radwaste operations departments, which were responsible for implementing the radioactive waste effluent management program and the radiological environmental monitoring program responsibilities, were reviewed.

Administrative and chemistry departmental procedures were reviewed for the assignment of responsibilities for the management and implementation of the radioactive waste effluent management program and the radiological environmental monitoring program.

b. Observations and Findings

Chemistry and radwaste operations personnel were responsible for the implementation of the radioactive waste effluent management program and the radiological environmental monitoring program. Management controls were effective in implementing the required programs. Since the previous NRC inspection, the personnel responsible for the radiological environmental monitoring program were incorporated into the chemistry department.

The chemistry department was adequately staffed. However, there had been changes in the chemistry technician staff during the past 1 ½ years. The chemistry department had reduced the number of chemistry positions from 32 to 28. The chemistry department currently has two positions vacant. The chemistry superintendent assumed the position in September 1996, and one new chemistry radiochemist was hired in February 1997. The licensee's reduction in chemistry staff did not appear to have adversely affected implementation of the radioactive waste effluent management program and the radiological environmental monitoring program.

The radwaste operations department was adequately staffed, and personnel had not changed significantly during the past 1 ½ years.

c. Conclusions

Staffing of the chemistry and radwaste operations departments met Technical Specification requirements. In the past 1 ½ years, the chemistry department experienced approximately a 20 percent staff reduction including the two current vacancies. The radwaste operations staff changed very little.

**R7 Quality Assurance in Radiological Protection and Chemistry Activities**

**R7.1 Radioactive Waste Effluent Quality Assurance Program**

a. Inspection Scope (84750)

Quality assurance audit and surveillance reports concerning the radioactive waste effluent management program and radiological environmental monitoring program activities were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies and to determine compliance with Technical Requirements Manual, Section 7.4.2.8. The review included the one annual audit of the combined programs and the one surveillance of the radiological environmental monitoring program performed since January 1996.

The licensee's standard audit plan for developing audits of Regulatory Guide 4.15 and the offsite dose calculation manual and implementing procedures was reviewed.

The qualifications of the quality assurance auditors were reviewed.

b. Observations and Findings

The Master Audit Plan, Revision 23, issued February 13, 1997, and the 1997 Audit Program Plan, issued December 17, 1996, showed scheduled and completed audits for the period 1995 through 1997. The master audit plan indicated that the audits of the radioactive waste effluent management program, radiological environmental monitoring program, the offsite dose calculation manual, and Regulatory Guide 4.15 were being performed concurrently on an annual frequency. The audit schedule was in compliance with the technical requirements manual and quality assurance audit procedures.

Annual audits encompassing the radioactive waste effluent management program, radiological environmental monitoring program, offsite dose calculation manual, and implementing procedures were performed in accordance with the technical requirements manual requirements.

The quality assurance radioactive waste effluent management program and radiological environmental monitoring program audit and surveillance report of the radiological environmental program performed since January 1996 were conducted in accordance with quality assurance procedures by qualified auditors, who were

knowledgeable in radiological waste effluent programs, radiological environmental monitoring programs, and offsite dose calculation manual requirements at nuclear power facilities. The audit report of the radioactive waste effluent management and radiological environmental monitoring programs was of high quality, technically comprehensive, and provided good oversight and evaluation of the licensee's performance in implementing the radioactive waste effluent management program and the radiological environmental monitoring program.

c. Conclusions

Oversight of the radioactive waste effluent management program and the radiological environmental monitoring program was good. The quality assurance audit and surveillance reports of the radiological waste effluent management program and radiological environmental monitoring program activities were technically comprehensive and provided good program evaluation.

R7.2 Quality Assurance Program for Contractors

a. Inspection Scope (84750)

The quality assurance vendor audit program regarding contractors and the offsite environmental laboratory performing surveillance activities involving the radioactive waste effluent program, radiological environmental monitoring program, and engineered-safety feature air cleaning ventilation systems was reviewed.

b. Observations and Findings

A contractor laboratory was used to perform required radiochemistry analyses of liquid and airborne particulate radioactive waste effluent composite samples. A second contractor was used to perform in-place filter testing of the station's engineered-safety feature ventilation systems and perform laboratory analyses of the charcoal adsorber material. River Bend Station's environmental laboratory was used to perform analyses of the radiological environmental samples.

The licensee used nuclear procurement issues committee audits of the two contractors and an audit of the River Bend Station's environmental laboratory performed by River Bend Station's quality assurance department to evaluate the performance of the contractors and environmental laboratory in performing their respective surveillance testing requirements. The audits were comprehensive and satisfactory to evaluate each of the contractor's abilities to perform their respective Technical Specification required analyses and surveillance testing activities.

c. Conclusion

There was appropriate evaluation of the contractors' performance.



V. Management Meetings

**X1 Exit Meeting Summary**

The inspectors presented the results of the inspection to members of licensee management at the conclusion of the inspection on June 5, 1997. The licensee acknowledged the findings presented. Mr. G. Coker, Chemistry Superintendent, committed to reinstate the fish media sampling at an annual frequency. No proprietary information was identified.

## ATTACHMENT 1

### SUPPLEMENTAL INFORMATION

#### PARTIAL LIST OF PERSONS CONTACTED

##### Licensee

J. Hagan, Vice President, Operations  
C. Abbott, Reviews Supervisor, Quality Programs  
R. Benson, Radwaste Supervisor, Radiation Control  
R. Buckley, Corporate Environmentalist  
W. Cade, Operations Assistant, Operations  
G. Coker, Superintendent, Chemistry  
D. Cooper, Lead Non-licensed Operator Requalification Training Instructor  
D. Crawley, Environmental Specialist, Chemistry  
J. Czaika, Nuclear Specialist  
K. Daniels, Senior Radiochemist, Chemistry  
L. Daughtery, Technical Coordinator, Nuclear Safety and Regulatory Affairs  
C. Ellis, Training Coordinator, Chemistry  
W. Garner, Audit Supervisor, Quality Programs  
M. Guynn, Supervisor, Radiation Control  
C. Holifield, Licensing Engineer, Nuclear Safety and Regulatory Affairs  
W. Hughey, Director, Nuclear Safety and Regulatory Affairs  
R. Ingram, Supervisor, Nuclear Safety and Regulatory Affairs  
R. Jackson, Senior Licensing Specialist, Nuclear Safety and Regulatory Affairs  
M. Jones, Technical Specialist, Nuclear Safety and Regulatory Affairs  
J. Lassetter, Technical Specialist, Chemistry  
R. McCann, Senior Radiochemist, Chemistry  
M. Michalski, Radwaste Coordinator, Operations  
R. Moonaw, Manager, Maintenance  
B. Philpott, Senior Radiochemist, Chemistry  
J. Purvis, Senior Radiochemist, Chemistry  
R. Ruffin, Licensing Specialist, Nuclear Safety and Regulatory Affairs  
J. Venable, Manager, Operations

##### NRC

K. Weaver, Resident Inspector

In addition to the personnel listed above, the inspectors contacted other personnel during this inspection.

#### LIST OF INSPECTION PROCEDURES USED

IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
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## LIST OF DOCUMENTS REVIEWED

### Organization Charts

Chemistry Department

### Quality Assurance Documents

Master Audit Plan, Revision 23, February 13, 1997

1997 Audit Program Plan, December 17, 1996

Standard Audit Plan for Regulatory Guide 4.15 and Offsite Dose Calculation Manual, Revision 0

### AUDITS AND SURVEILLANCES

Quality Program Audit Report QPA 12.01-96, "Regulatory Guide 4.15 and Offsite Dose Calculation Manual," August 5-15, 1996

Quality Surveillance Report, "Environmental Sampling," September 10, 1996

### Vendor Audits

"Yankee Atomic Environmental Laboratory (Y 123)," June 19-20, 1995

"Commonwealth Edison NUPIC Audit of NCS Corporation Audit Number G96-10," November 18-21, 1996

"River Bend Station Quality Assurance Audit of Effluent and Environmental Monitoring Programs, Audit 96-06-1-ENVL/REMP," June 10-21, 1996

### PROCEDURES

06-CH-SG17-N-0042, "Radwaste Release Dissolved Gases," Revision 100, March 20, 1995

06-CH-SG17-M-0043, "Radwaste Monthly Composite," Revision 102, August 1, 1996

06-CH-SG17-M-0046, "Liquid Effluent Dose Calculations," Revision 101, December 9, 1996

06-CH-SG17-O-0045, "Radwaste Release Post Release Calculations," Revision 101, September 26, 1996

06-CH-SG17-P-0041, "Radwaste Release Pre-release Analysis," Revision 102, September 11, 1996

06-CH-SG17-Q-0044, "Radwaste Release Quarterly Composite," Revision 100, March 20, 1995

06-CH-1D17-M-0003, "Building Ventilation Gaseous Tritium," Revision 100, January 20, 1997

06-CH-1D17-M-0005, "Building Ventilation Exhaust Gaseous Isotopic," Revision 101, February 21, 1997

06-CH-1D17-M-0018, "Gaseous Release Points Particulate Alpha Activity," Revision 101, March 20, 1995

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08-S-09-9, "Review of Radiological Environmental Analytical Results," Revision 3,  
May 14, 1997

#### REPORTS

Annual Radioactive Effluent Release Reports - 1995 and 1996

Annual Radiological Environmental Monitoring Reports - 1995 and 1996

#### Miscellaneous Documents

Offsite Dose Calculation Manual, Revision 20, July 1996

Selected Liquid Radioactive Waste Batch Release Permits

Chemistry department training records

Radwaste operations department training records

Air cleaning systems surveillance test records

Evaluation 96-0036-R00 for the Radiological Environmental Monitoring Program

Radiological Environmental Program Results 1978-1996



## Attachment 2

Summary of All Liquid Effluent Releases				
	1993	1994	1995	1996
Number of Batch Releases	263	273	225	197
Fission & Activation Products (Curies)	1.656E-01	2.395E-01	3.525E-01	3.825E-01
Tritium (Curies)	62.87	161.70	131.10	216.40
Dissolved & Entrained Noble Gases (Curies)	5.765E-04	2.444E-04	2.202E-04	1.185E-03
Waste Volume Released (Liters)	2.681E+07	2.780E+07	2.272E+07	1.945E+07

Summary of All Airborne Effluent Releases				
	1993	1994	1995	1996
Continuous Releases				
Fission & Activation Products (Curies)	94.46	33.54	58.46	93.20
Total Iodine-131 (Curies)	4.716E-04	4.901E-05	1.152E-04	6.565E-04
Particulates w/ $T_{1/2} > 8$ Days (Curies)	8.877E-05	4.234E-05	7.922E-05	2.973E-05
Gross Alpha (Curies)	2.681E-08	1.723E-07	7.590E-08	5.610E-08
Tritium (Curies)	22.92	53.12	45.32	87.90

Maximum Annual Doses From Gaseous & Liquid Effluent Releases				
	1993	1994	1995	1996
<b>Liquid Effluents</b>				
Organ (Liver) (mrem)	0.226	0.086	0.094	0.181
Whole Body (mrem)	0.156	0.070	0.049	0.071
<b>Gaseous Effluents</b>				
Gamma Air Dose (mrad)	0.021	0.014	0.027	0.041
Beta Air Dose (mrad)	0.023	0.010	0.028	0.045
Iodine-131, 133, Tritium, and Particulates w/ $T_{1/2} > 8$ Days (mrem)	0.240	0.071	0.061	0.135