

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-416
License No.: NPF-29
Report No.: 50-416/96-19
Licensee: Entergy Operations, Inc.
Facility: Grand Gulf Nuclear Station
Location: Waterloo Road
Port Gibson, Mississippi
Dates: November 4-7, 1996
Inspector: Thomas H. Andrews Jr., Radiation Specialist
Approved By: Blaine Murray, Chief, Plant Support Branch
Division of Reactor Safety

Attachment: Supplemental Information

EXECUTIVE SUMMARY

Grand Gulf Nuclear Station NRC Inspection Report 50-416/96-19

This routine, announced inspection focused upon the licensee's radiation protection program and its conduct during the Fall 1996 refueling outage. The inspection occurred during the middle of the outage, providing a good opportunity to observe ongoing activities associated with the outage.

Plant Support

- Workers were knowledgeable regarding the settings of the electronic dosimeters and the required response to dosimeter alarms. Dose extensions were granted in accordance with the licensee's procedures. Radiation protection technicians were aware of conditions in work areas and actively supported work in progress to maintain exposures as low as is reasonably achievable (ALARA) (Section R1.1).
- The use of engineering controls, filtration, and evaluation of respirator usage were appropriate to help maintain personnel exposures ALARA. Air sampling was performed properly. Examples of improperly stored respirators in emergency lockers were noted (Section R1.2).
- The licensee had a good program for maintaining radiation protection instruments. Area radiation surveys were accurate. There was an isolated example of an inaccurate radioactive material tag on a sea/land container. Examples of minor problems associated with housekeeping and contamination control within the radiologically controlled area were identified (Section R1.3).
- The licensee has maintained cumulative personnel exposure below the industry average for boiling water reactors. In general, projections indicated that the licensee would achieve the exposure goal set for the outage and for 1996. Based upon the projected trend, the licensee was continuing to reduce personnel exposures (Section R1.4).
- The licensee trained and maintained adequate staffing levels of qualified contractor radiation protection personnel to supplement the permanent staff. Training provided to radiation workers was good (Section R5.1).
- The licensee's self assessment of the radiation protection program was very good. Assessments were performed on a wide scope of activities. Findings and recommendations were addressed by management appropriately (Section R8.1).

Report Details

Summary of Plant Status

The plant was shut down for refueling during the inspection period. There were no operational occurrences that impacted the results of this inspection.

III. Engineering

E2 Engineering Support of Facilities and Equipment

A recent discovery of a licensee operating their facility in a manner contrary to the Updated Final Safety Analysis Report (UFSAR) description highlighted the need for a special focused review that compares plant practices, procedures, and/or parameters to the UFSAR description. While performing the inspection discussed in this report, the inspector reviewed the applicable portions of the UFSAR that related to the areas inspected. The inspector verified that the UFSAR wording was consistent with the observed plant practices, procedures, and/or parameters.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 External Exposure Controls

a. Inspection Scope (83750)

The inspector reviewed the licensee's personal dosimetry program to determine if it met requirements. Management and administrative controls of external radiation exposure designed to maintain exposures ALARA were reviewed.

b. Observations and Findings

During tours of the plant, the inspector observed that personnel were wearing dosimetry properly. When questioned, workers in the radiologically controlled area were able to state the alarm setpoints for both accumulated dose and dose rate as established by their radiation work permit.

The inspector reviewed condition reports regarding personnel entering the radiologically controlled area either without dosimetry or without the dosimetry turned on. The followup actions taken by the licensee were discussed. These actions primarily focused upon the individual worker.

On multiple occasions during the inspection, when logging into the radiologically controlled area, the inspector received a message on the terminal that the dosimeter failed the source check. This message was small and in the upper portion of the

screen. When the dosimeter was removed, there was no message to the worker remaining on the screen warning them not to enter the radiologically controlled area. The inspector informed the licensee that this situation may be a contributing factor to people entering the radiologically controlled area with the dosimeters turned off. The licensee indicated that this condition, combined with other licensee identified factors were being reviewed for additional corrective actions.

The licensee administratively limited annual personnel exposure to 2 rem. Authorization to exceed this level required progressively increasing levels of management approval to authorize personnel to exceed preset limits. The licensee granted 22 dose extensions to 19 individuals. The breakdown of extensions granted is shown below.

Maximum Exposure Authorized by Extension	Number of People Extended
2.5 rem	2
3.0 rem	16
3.2 rem	1
3.5 rem	1
4.0 rem	2

This showed that the licensee was aggressively controlling exposures for personnel, including contractor personnel. There were no dose extensions required for Entergy Operations, Inc., personnel. The reason dose extensions were needed for contractors was due to their annual exposure prior to arriving at the licensee's facility.

During a tour of containment, the inspector observed radiation protection technicians response to a situation in which an individual had knocked a lens out of his prescription glasses while dressed in protective clothing in a contamination area. The individual indicated that he felt something in his eye. Radiation protection personnel assisted in removing the protective clothing, monitoring, and getting medical assistance to the individual as quickly as possible.

The inspector observed activities at access control points established throughout the radiologically controlled area. The radiation protection technicians were observed briefing workers on dose rates and contamination levels in the area where work was to be performed. Technicians were cognizant of job progress within their assigned areas and were often observed suggesting alternative waiting areas for personnel to reduce exposures.

During the outage, the licensee documented 39 skin contaminations and 8 skin/clothing contaminations. Only one of these incidents met the licensee's threshold for additional dose assessment. The licensee's assessment determined that a dose of 39 mRad was received as a result of the contamination event.

c. Conclusion

Workers were knowledgeable regarding the settings of the electronic dosimeters and the required response to dosimeter alarms. Dose extensions were granted in accordance with the licensee's procedures. Few skin exposures were noted. Radiation protection technicians were aware of conditions in work areas and actively supported work in progress to maintain exposures ALARA.

R1.2 Internal exposure controls

a. Inspection Scope (83750)

The inspector reviewed the licensee's assessment of individual intakes of radioactive materials, the use of process or other engineering controls to limit concentrations of airborne radioactive materials, the administrative controls of internal radiation exposure to meet requirements and maintain personnel exposures ALARA.

b. Observations and Findings

The licensee issued seven filter respirators for radiological purposes during the outage. Nine bubble hoods were used during control rod drive pulls due to high contamination concerns. Based upon whole body counting results, there had been only one positive whole body count with a calculated exposure of 18 millirem.

Air sampling practices were observed throughout the plant. The licensee used a mixture of continuous air monitors and low flow air samplers to monitor airborne activity. Most of these were used for trending purposes. Those used to monitor specific job activities were properly placed to take representative air samples.

The inspector observed the use of engineering controls and filtration systems to minimize exposure to potential airborne radioactive material. This was consistent with requirements in 10 CFR Part 20.

The inspector reviewed the storage of respiratory protection equipment. Respirators stored for routine use in the radiologically controlled area were properly stored. However, the inspector noted that some of the respirators stored in two emergency response lockers were stored in an improper orientation. Improper storage could affect the ability of the respirator to gain a good seal on the wearer's face due to distortion of the sealing surface. An investigation conducted by the licensee determined that every emergency response locker had at least one example of a

respirator stored improperly. The licensee corrected the respirator orientation problems that were identified and initiated corrective actions to ensure that personnel were aware of the need for correct orientation of respirators in storage.

c. Conclusions

The low internal exposure results compared with the level of use of respirators showed that the use of engineering controls, filtration, and evaluation of respirator usage were appropriate to help maintain personnel exposures ALARA. Air sampling was performed properly. Instances of improperly stored respirators in emergency lockers were noted.

R1.3 Control of Radioactive Materials and Contamination, Surveys and Monitoring

a. Inspection Scope (83750)

The inspector reviewed the licensee's radiation protection instrument program, performed independent radiation surveys, and observed work practices within the radiologically controlled area.

b. Observations and Findings

The licensee maintained an adequate inventory of calibrated instruments to support the outage. The licensee was able to retrieve an instruments repair history upon request. The licensee provided documentation showing that instrument use was reviewed within 24 hours after an instrument was found to be inoperable or out-of-tolerance.

While touring the radiologically controlled area, the inspector performed independent radiation surveys. These surveys confirmed that the licensee radiation survey maps were generally accurate.

However, an exception was noted while performing an area radiation survey in the radwaste storage area. A sea/land container marked as being 20 millirem per hour with the observed dose rate was measured at approximately 30 millirem per hour. The radwaste storage area was posted as a radiation area/radioactive materials storage area. The difference between the survey reading on the tag and the inspector's survey was identified to the licensee.

The licensee performed a detailed survey of the sea/land container and determined that the correct information should reflect approximately 45 millirem per hour. The licensee determined that items had been added to the container resulting in increased radiation levels from the container and the tag had not been updated to reflect these changes. The tag was updated with the correct information. The remaining containers in the area were surveyed and no other discrepancies were identified.

The inspector found two radioactive material tags on the floor in the hot tool room. The tags had either been removed and improperly discarded or had come loose from the objects to which they had been attached. This was identified to the licensee. No items in the immediate area were identified as being improperly tagged.

While touring containment, the inspector observed water flowing out of a contamination area around the hydraulic control units. Because of the amount of water on the floor, the inspector concluded this condition had existed for some time without it being identified and corrected. The inspector contacted radiation protection to report the problem, then remained in the area to ensure people did not step into the water until personnel arrived to correct the problem.

Housekeeping in work areas tended to degrade as a function of distance from the reactor. The best housekeeping was in containment and the worst was in the turbine building. The inspector identified many examples where items were found across the boundary of contamination areas. These primarily included hoses and cords that were not properly secured. The licensee quickly corrected the items identified.

The inspector observed that the licensee maintained adequate supplies of protective clothing throughout the facility. At dress-out areas, personal clothing was observed hanging from plant equipment instead of racks provided for this purpose. The licensee quickly responded to correct this. The equipment involved was not safety related, but the licensee acknowledged that use of plant equipment to hang clothing was inappropriate.

The inspector observed the relocation of one of the laundry trailers to permit digging to repair a water line leak. The inside of the laundry trailers were designated as a radiation/contamination area. Proper preparation, radiological controls, and posting of the area were noted.

c. Conclusions

The licensee had a good program for maintaining radiation protection instruments. Generally, area radiation surveys were accurate. There was an isolated example of an inaccurate radioactive material tag on a sea/land container. Examples of minor problems associated with housekeeping and contamination control within the radiologically controlled area were identified.

R1.4 ALARA program

a. Inspection Scope

The inspector reviewed the licensee's personnel exposure goals, control of emergent work, ALARA review process. The inspector observed an ALARA briefing provided to workers as part of the work process.

b. Observations and Findings

Cumulative exposure for the year was 207 versus a goal of 325 person rem. Total exposure for the outage was 158 person rem versus a goal of 255 person rem. The major activities for the outage included removal and replacement of the "A" recirculation pump, control rod drive replacement, and safety relief valve change out.

The trend for the past 3 years compared to BWR-6 reactors and industry average boiling water reactors is shown below.

	1993	1994	1995	1996
Grand Gulf - Actual	332 person rem	56 person rem	342 person rem	325 person rem
Grand Gulf - 3 year Average	306 person rem	290 person rem	243 person rem	241 person rem
BWR 6 - 3 year Average	338 person rem	398 person rem	296 person rem	
BWR - 3 year Average	336 person rem	338 person rem	310 person rem	

The inspection was performed at approximately midway through the outage. According to the licensee's dose tracking for jobs planned through the time of the inspection, the licensee anticipated meeting the outage goal. The licensee provided examples where they identified emergent work for the outage. The process for approval of this work was reviewed and found to be well implemented.

The inspector reviewed the dose estimates for selected radiation work permits. Dose estimates were typically based upon historical data. ALARA recommendations were incorporated into the work scope or radiation work permit.

The inspector observed the ALARA briefing for radiography outside of the radiologically controlled area. Topics discussed included industry events, allowances for fire watch to enter the area, doses, dose rates and barricading. Special consideration was provided for control of access on the opposite side of a block wall because of potential streaming. These controls were adequate to prevent unplanned exposure.

c. Conclusions

The licensee had maintained cumulative personnel exposure below the industry average for both boiling water reactors and BWR-6 plants. Projections indicated that the licensee would achieve the exposure goal set for the outage and for 1996. Based upon the projected trend, the licensee was continuing to reduce personnel exposures.

R5 Staff Training & Qualification

R5.1 Training & qualification of personnel

a. Inspection Scope

The inspector reviewed the applicable education, experience, qualifications and training of contract radiation protection technician that were onsite to supplement the licensee's permanent staff. The inspector reviewed the applicable training provided for the refueling outage.

b. Observations and Findings

For outage staff augmentation, the licensee employed 41 contractor senior radiation protection technicians. Of these, 35 were qualified to American National Standards Institute (ANSI) 3.1 criteria, and 6 were qualified to ANSI 18.1 criteria. There were 33 contractors that had worked at an Entergy Operations, Inc., site; 15 of which had previous experience at the licensee's facility. The inspector reviewed experience histories for selected contractors to verify the process for attributing applicable work experience. The process was determined to be valid.

The licensee used shared resource personnel from other Entergy Operations, Inc., sites. These resources included 24 technicians and 2 supervisors.

The licensee provided training on procedures and management expectations as part of the indoctrination process for contractor radiation protection technicians and support staff from other Entergy Operations, Inc., sites.

According to the licensee, approximately one-third of the workers (non-technician) hired to support the outage did not have nuclear experience. While working in the radiologically controlled area, these workers demonstrated extra caution and attention to detail regarding work practices and use of protective clothing. They were able to demonstrate knowledge of their radiation work permit, response to dosimetry alarms, and were knowledgeable of the conditions in their work area.

c. Conclusions

The licensee trained and maintained an adequate staff of qualified outage contract radiation protection personnel to supplement the permanent staff. Based on the results of conversations with workers in the radiologically controlled area training provided to radiation workers was determined to be good.

R7 Quality Assurance in Radiological Protection and Chemistry Activities

R7.1 Quality Assurance Audits and Assessments

a. Inspection Scope

The inspector reviewed audit reports and surveillances performed by quality assurance organization and self assessments performed by radiation protection.

b. Observations and Findings

The documents reviewed provided a thorough assessment of various facets of the licensee's radiation protection program. Findings and recommendations were clearly identified and supported by data within the documents. Management response to findings and recommendations was determined to be appropriate.

The self assessment of the radiation protection program by a team of individuals from around the industry provided a good evaluation of the program. The findings contained within this document provided excellent insight into areas of weaknesses and strengths and provided good recommendations for improvement. The findings and the presentation of the results indicated that the personnel performing the audits had a good working knowledge of the radiation protection program and the requirements for this program.

c. Conclusions

The licensee's self assessment of the radiation protection program was very good. Assessments were performed on a wide scope of activities. Findings and recommendations were addressed by management appropriately.

R8 Miscellaneous Radiological Protection and Chemistry Issues

R8.1 Industrial Safety

During tours of the plant, the inspector discovered several unsecured gas cylinders in the storage area surrounding the hot tool room. In the turbine building, a gas cylinder was secured using a piece of wire near the top of the cylinder. A second cylinder was found with the wire on the "neck" of the bottle secured to a handrail. The licensee promptly corrected these situations after they were notified by the inspector.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the results of the inspection to members of licensee management at the conclusion of the inspection on November 7, 1996. The licensee acknowledged the findings presented.

The inspector asked the licensee whether materials examined during the inspections should be considered proprietary. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Benson, Radwaste Supervisor
A. Burks, Senior Health Physics Specialist
N. Edney, Radiation Control Supervisor
M. Guynn, Radiation Control Supervisor
T. Kriesel, Radiation Control Superintendent
M. Larson, Nuclear Safety & Regulatory Affairs Specialist
J. Watts, Instrument/Respirator Specialist

NRC

J. Tedrow, Senior Resident Inspector
K. Weaver, Resident Inspector

INSPECTION PROCEDURES USED

83750 Occupational Radiation Exposure

LIST OF DOCUMENTS REVIEWED

Quality Program Audit Report QPA 32.01-95, GIN 95-02147, "Health Physics
Radioactive Laundry Program," July 28, 1995

Quality Program Audit Report QPA 37.01-95, GIN 95-02148, "Health Physics Exposure
and Contamination Control Program," July 28, 1995

Quality Program Audit Report QPA 32.02-95, GIN 95-03348, "Health Physics Low Level
Waste and NRC Approved Packaging Program," December 11, 1996

Quality Program Audit Report QPA 15.01-96, GIN 96-01260, "Process Control
Program," May 17, 1996

Quality Program Audit Report QPA 37.01-96, GIN 96-01374, "Health Physics Program,"
June 3, 1996

"GGNS Radiation Protection Program Self Assessment," July 29, 1996

Quality Surveillance Report, GIN 96-02211, "Personnel Monitoring," September 6, 1996

Quality Surveillance Report, GIN 96-02241, "Radiological Postings," September 10,
1996

Quality Surveillance Report, GIN 96-02293, "Radioactive Laundry Shipment Surveillance," September 18, 1996

Condition Report GGCR1996-0166-00, October 16, 1996, Improper exit from radiologically controlled area

Condition Report GGCR1996-0217-00, October 24, 1996, Low volume air sampler in drywell found unplugged

Condition Report GGCR1996-0298-00, October 30, 1996, Power lost to flashing lights used as warning device for locked high radiation areas around the fuel pool heat exchanger