



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 REGION II
 101 MARIETTA STREET, N.W., SUITE 2900
 ATLANTA, GEORGIA 30323-0199

MAR 16 1994

Report No.: 50-416/94-06

Licensee: Entergy Operations, Inc.
 Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-29

Facility Name: Grand Gulf

Inspection Conducted: February 14-17, 1994

Inspector: *J. Necker for* 3/18/94
 N. G. McNeill, Radiation Specialist Date Signed

Approved by: *T. Decker* 3/18/94
 T. R. Decker, Chief Date Signed
 Radiological Effluents and Chemistry Section
 Radiological Protection and Emergency Preparedness Branch
 Division of Radiation Safety and Safeguards

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of transportation and radioactive waste handling, area radiation monitor calibration and surveillances, results of the Confirmatory Measurements program sample analyses, releases from the Standby Service Water Basin, and followup on previously identified items.

Results:

Two violations were identified:

- The licensee had failed to comply with the State and burial site requirements for prohibition of methane gas in dewatered ion exchange resins shipped to the disposal site (Paragraph 2).
- The licensee had failed to meet sampling requirements for releases from the Standby Service Water Basin as required by 10 CFR Part 20 (Paragraph 4).

In addition the adequacy of licensee programs to analyze the Iron-55 radionuclide in effluents was identified as an unresolved item pending further review of applicable procedures, training, and quality control activities (Paragraph 3).

The following items are considered closed:

- Previously identified violation for failure to comply with State and disposal site requirements for free standing liquid in dewatered ion exchange resins shipped to the disposal site (Paragraph 5).
- Failure to perform required surveillances on area radiation monitors in the dryer storage area as required when fuel is stored in that area (Paragraph 6).
- The licensee had instituted administrative controls over Turbine Building roof vent hatches to assure that they remained closed and did not constitute an unmonitored release pathway (Paragraph 7).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *M. Bakarich, Manager, Materials, Purchasing, and Contracting
- *M. Carver, Radwaste Specialist, Radwaste/Health Physics
- L. Daugherty, Superintendent, Licensing
- *J. Dimmette, Manager, System Engineering
- *C. Dugger, Manager of Operations
- N. Edney, Coordinator, Health Physics
- *M. Guynn, Supervisor, Radiation Control
- *C. Hayes, Director, Quality
- *C. Hutchinson, Plant General Manager
- *D. Jackson, Coordinator, Chemistry
- *J. Landers, Supervisor, Radwaste/Health Physics
- *M. Meisner, Director, Nuclear Licensing
- *M. Michaelski, Coordinator, Radiological Waste
- W. Poe, Environmental Specialist, Chemistry
- *J. Roberts, Manger, Maintenance
- *R. Ruffin, Specialist, Licensing
- *T. Tankersley, Superintendent, Radiological Control
- T. Williamson, Superintendent, Chemistry

Other licensee employees contacted included maintenance personnel, technicians, and administrative personnel.

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- *R. Bernhard, Senior Resident Inspector

*Attended exit interview

2. Transportation and Radwaste Handling (86750 and 84750))

Technical Specification (TS) 6.8.1.g requires the licensee to establish, implement, and maintain written procedures covering implementation of the Process Control Program (PCP). TS 1.32 specifies that the PCP shall contain the current formulas, sampling, analyses, tests and determinations to be made to ensure that processing and packaging of solid radioactive wastes, based on demonstrated processing of actual or simulated wet solid wastes, will be accomplished in such a way as to assure compliance with 10 CFR Parts 20, 61, and 71, State regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste. Section 49 of Amendment No.45, of License No. 097, issued to Chem-Nuclear Systems, Inc., Barnwell, South Carolina, by the State of South Carolina, requires that shipments intended for storage shall not contain explosive gases.

The licensee discussed with the inspector the sequence of events which resulted in the shipment of a container of dewatered resins to the burial site on December 9, 1993. The shipment was received on December 10 and during loosening of the ratchet binders on the cask, "air" was found to be escaping from the lid. Chem-Nuclear sampled the air and detected 95 percent of the Lower Explosive Limit (LEL) for methane gas. Based on this information, the State inspector was notified of the unusual occurrence. The remaining ratchet binders were loosened and with the lid in place, the cask was placed in a holding area. The licensee held up all offsite shipments to Barnwell until corrective actions could be taken. The shipment was held for several days, sampled again, and buried when no further gas producing activity was found.

The licensee determined that the abovementioned shipment, Radwaste Shipment No. 93-1207, which contained resin from the RWCU "B" phase separator tank, contained methane producing bacteria. This waste stream had not previously been found to contain these type microorganisms.

At the time of the inspection, the licensee indicated that several steps had already been initiated to prevent a recurrence. These consisted of treating RWCU A and B waste tanks with approved biocides prior to further shipments, procedural changes to identify potential methane producing bacteria in other waste streams, and a Quality Deficiency Report (QDR) (No. 0300-93) was initiated to document the occurrence and to track all corrective actions.

Based upon the above reviews, it was concluded that the licensee had failed to comply with the PCP which requires that State and disposal site limits for explosive gases in dewatered resins shipped to the disposal site be met (VIO 50-416/94-06-01).

One violation was identified.

3. Confirmatory Measurements (84750)

10 CFR 20.1501 requires the licensee to perform surveys as necessary to evaluate the extent of radiation hazards.

Table 4.11.1.1-1 of the Offsite Dose Calculation Manual (ODCM) requires the licensee to evaluate each batch release composite from the Waste Release Tanks to be analyzed quarterly for radionuclide activity to include Tritium, Strontium-89 and -90, and Iron-55.

The licensee uses measurements of effluent streams to assess doses to the public resulting from the operation of the plant. In order for the licensee to assess the doses to the public accurately, it is imperative that the measurements of the different streams be representative and accurate.

Pursuant to these requirements, the inspector evaluated the licensee's analytical capability to make accurate radioactivity measurements. Prior to this inspection, samples containing beta/gamma-emitting radionuclides were shipped to the licensee. These samples, which are one portion of the NRC's Confirmatory Measurements Program, are supplied by the Department of Energy's Radiological Environmental Sciences Laboratory (RESL) at the Idaho National Engineering Laboratory (INEL) in Idaho Falls, Idaho.

The results of the licensee's analysis were received by the Radiological Effluents and Chemistry Section within the allotted 60 day time frame. The results of the licensee are presented in Attachment 2 and a discussion of the NRC's acceptance criteria is included in Attachment 1.

The results submitted by the licensee were found to be in agreement for all radionuclides with the exception of the Iron-55 analysis. The values submitted for Iron-55 were found to be approximately two times higher than the known activities. These values were outside of the acceptability limits as detailed in the NRC's Acceptance Criteria. A March 17, 1994 teleconference was conducted between Ms. J. Antoine, Chemistry Supervisor, Grand Gulf Nuclear Station, and Mr. G. Kuzo NRC, RII, regarding quality control results accompanying the routine quarterly liquid effluent composites. The inspector noted that all Iron-55 quality control results were within seven percent of the known values. The licensee had no firm information on what may have been the cause of this inaccurate Iron-55 measurement of the NRC confirmatory measurement sample. The inspector informed licensee representatives that the inaccurate Iron-55 measurement would be considered an unresolved item (URI) pending further review of applicable procedures, training, and quality control activities and results (URI 50-416/94-06-02).

The licensee stated that they had already planned to shift to a vendor laboratory to analyze the beta/gamma portion of the Confirmatory Measurements Program.

One URI was identified regarding the adequacy of licensee programs to analyze the Iron-55 radionuclide in effluents.

4. Standby Service Water (SSW) Basin Releases (84750)

10 CFR 20.1302(a) requires that the licensee shall make or cause to be made, as appropriate, surveys to evaluate the extent of radiation levels and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in 10 CFR 20.1301.

The licensee identified a potential violation of its State of Mississippi Water Pollution Control Permit No. MS0029521 in that the concentration of chlorides in the SSW Basin leakage was not being quantified. The SSW basin was observed to be leaking water during

Quality Programs Audit 94/0001. The issue of the possibility of radioactive contamination of this water was not identified in this report.

During the inspection, the inspector observed this continual and substantial leakage of water from both basins. The leakage runs across the parking lot, past the Administrative Building parking areas, into the 100-Year ditch, and finally to the Sediment Basin. There is heavy traffic through these areas and consequently through the stream of water. It was explained to the inspector that this runoff or leakage was unavoidable due to the design of the basins and intermittent use of the basin fan suction system. During the inspection quite substantial leakage/overflow was observed in both Basins A and B. Algal growth in the flow areas indicates that the flow may have been occurring over an extended period.

The licensee supplied the inspector with three Batch Release Reports for June, July, and August 1993. These reports contained results that were at or below Minimal Detectable Activity (MDA) for all radionuclides of interest. However, no other sampling data was available since that time frame. From the data reviewed, there was no immediate concern to the health and safety of the public or workers from this release; however, the potential still exists for radiological contaminants to be released to SSW Basins.

It was discussed with the licensee that this failure to sample and quantify these releases from the SSW Basin was a violation of the abovementioned requirements under 10 CFR 20 and possibly of the requirements as outlined in the ODCM for batch releases as outlined in Table 4.11.1.1-1 for the principal gamma emitters. While the licensee agreed that some remedy of the situation was warranted, they felt that this leakage was unavoidable and did not represent an unmonitored release. The licensee indicated that this water is sampled and analyzed weekly; however, analysis sensitivity is not sufficient to detect minute quantities (environmental LLD levels) of radioactive material. In those infrequent cases where actual batch releases were performed the requirements of Table 4.11.1.1-1 are being met. The licensee felt that these releases from the SSW basin due to overflow and runoff, while substantial in volume, were unavoidable and in any case did not constitute "Batch" releases. The inspector presented the position that these releases represented a potential for low level contamination over a widespread area and subsequent exposures to plant personnel as well as the public.

Based upon the above reviews, it was concluded that the licensee had failed to meet the requirements of 10 CFR 20 in that releases were being made from the SSW Basin which were not being quantified (VIO 50-416/94-06-03).

One violation was identified.

5. Licensee Action on Previous Inspection Findings, Transportation, and Radwaste Handling Violation (86750 and 84750)

(Closed) VIO 50-416/93-22-01: Failure to comply with State and disposal site requirements for freestanding liquid in resins shipped to the disposal site.

This violation was identified through the disposal site random selection process which examined a dewatered resin shipment transferred from the licensee to the burial site and determined that excess water was contained in the container. The water was found to be in excess of the one-half percent (0.5%) allowable limit for free standing liquids in solidified radioactive wastes.

The licensee determined that the limit on free standing liquids was exceeded through a series of events. On October 8, 1993, approximately 100 cubic feet of resins were transferred from the Floor Drain Demineralizer. This stream normally only contains bead resins. The resin was found to also contain powdered resins which clogged the internal filter during dewatering. Based upon consultation with the vendors technical staff, a decision was reached to dewater the resin with a powdered resin type shipping container. The resin was processed per normal procedures, dried to the appropriate relative humidity criteria, and placed in a shipping cask. The cask was shipped to the burial site on November 8, 1993. The licensee was notified by the disposal site operator that the container had been selected for testing to verify compliance and found to exceed allowable limits for free standing liquids.

The licensee suspended shipments of mixed type resins until an investigation into the cause of this event was complete. The licensee determined that the cause of the excessive liquids was in the selection of the container type for the waste media based on the GGNS Waste Characterization Form. The licensee has issued a memorandum to assure that mixed type resins are not introduced into resin specific type containers. A new mixed resin-type container has been obtained which can handle the bead and powdered type resins. GGNS Radiation Protection Procedure 08-S-01-25 has been revised to provide verification of the PCP and container suitability for all media. Health Physics Form HP-616 has been revised to ensure verification of container suitability for both waste classification and PCP requirements. Long term training of vendor personnel has also been performed.

These actions appear to address the concerns identified in the Violation and therefore the issue is closed.

One violation was closed.

6. Licensee Action on Previous Inspection Findings and Effluent Monitoring Instrumentation (84750)

TSs 3.3.7.11 and 3.3.7.12 identify the surveillance and calibration requirements for liquid and gaseous effluent monitors.

TS 4.3.7.1 requires that radiation monitoring be demonstrated as being operable by channel checks. An Area Radiation Monitor (ARM) is required to be operable in the Dryer Storage Area when fuel is stored in the area.

A Noncited Violation was identified in Inspection Report No. 93-17, October 18-22, 1993. New fuel had been placed in the Dryer Storage Area on October 6, 1993. The required channel checks were not performed within the required 12 hour time frame. The monitor in question was found to have been operable during the time in question after the fact. These events were outlined in QDR No. 0224-93, dated October 9, 1993.

Since the time of the last inspection, the licensee has changed Procedure 06-OP-1000-D-0001, Daily Operating Log. This log which formally allowed the operability checks to be marked as "N/A" for "Not Applicable" under conditions of no fuel in the area, has been changed to require operability checks be performed under all conditions.

This action is provided to prevent recurrence of a situation in which the operability checks are not performed as required when fuel is present. They will be performed under all operating conditions.

The actions taken by the licensee have addressed concerns raised by the inspector and the issue is therefore closed.

7. Licensee Action on Previous Inspection Findings and Turbine Building Roof Hatches (84750)

(Closed) IFI 50-416/92-17-01: Evaluation of the Turbine Building roof hatch unmonitored pathway with respect to 10 CFR 20.201.

The licensee had previously submitted to the NRC information concerning this issue. The Regional office had asked for a decision by NRR concerning whether this constitutes a generic issue at this and other Boiling Water Reactors (BWRs).

The primary issue raised by NRR was a concern over the licensee's administrative controls over the opening and closing of the hatches. In the initial inspection which identified this issue, (50-416/92-17), it was noted that these hatches had remained open for some length of time and that while open could technically constitute an unmonitored pathway.

Since this issue was last discussed with the licensee, GGNS had instituted administrative control over the condition of the hatches by changes to the Turbine Building Operating Log round sheets. These logs require that Turbine Building operators visually examine the hatches

every shift to ensure that they remain closed. The logs require a signature that the hatches have been verified to be in the closed position for that operator for that shift.

These log sheets apparently are capable of identifying conditions in which the hatches have on rare occasions been found to be open. The licensee produced a QDR (QDR No. 0223-93) in which a Turbine Building operator identified a hatch which was found to be open and in which corrective action was taken. The hatch was closed, Health Physics notified, and the condition of the nearest Continuous Air Monitor was evaluated for abnormal activity. The issue of why the hatch was open was being investigated to prevent recurrence.

These administrative controls appear to address concerns raised about the Turbine Building hatches and therefore the issue is closed.

8. Exit Interview

The inspection scope and results were summarized on February 17, 1994, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed the inspection results, including likely informational content of the inspection report with regard to documents and/or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary.

Dissenting comments were received from the licensee concerning the citation of a violation for the releases from the Standby Service Water Basin.

A March 17, 1994 teleconference was conducted between Ms. J. Antoine, Chemistry Supervisor, Grand Gulf Nuclear Station, and Mr. G. Kuzo NRC, RII, regarding quality control results accompanying the routine quarterly liquid effluent composites. The inspector noted that based on the quality control results the issue regarding iron-55 measurement adequacy would be considered an unresolved item pending further review of applicable procedures, training and quality control analyses.

<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
50-416/94-06-01	Open	VIO - Failure to meet state and site requirements with respect to methane gas in dewatered resin shipment (Paragraph 2).
50-416/94-06-02	Open	URI - Review adequacy of licensee programs to analyze the Iron-55 radionuclide in effluents (Paragraph 3).
50-416/94-06-03	Open	VIO - Failure to sample and quantify releases from the SSW Basin as required of batch releases (Paragraph 4).

50-416/93-22-01	Closed	VIO - Failure to comply with State and disposal site requirements for freestanding liquid in resins shipped to the disposal site (Paragraph 5).
50-416/92-17-01	Closed	IFI - Evaluation of the Turbine Building roof hatch unmonitored pathway with respect to 10 CFR 20.201 (Paragraph 7).

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This enclosure provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In this criteria, the judgement limits denoting agreement or disagreement between licensee and NRC results are variable. This variability is a function of the NRC's value to its associated uncertainty. As the ratio of the NRC value to its uncertainty, referred to in this program as the resolution¹ increases, the range of acceptable differences between the NRC and licensee values should be more restrictive. Conversely, poorer agreement between NRC and licensee values must be considered acceptable as the resolution decreases.

For comparison purposes, a comparison ratio² of the licensee value to the NRC value for each individual nuclide is computed. This ratio is then evaluated for agreement based on the calculated resolution. The corresponding resolution and calculated ratios which denote agreement are listed in Table 1 below. Values outside of the agreement ratio for a particular nuclide are considered in disagreement.

TABLE 1

Confirmatory Measurements Acceptance Criteria
Resolutions vs. Comparison Ratio

<u>Resolution</u>	<u>Comparison Ratio for Agreement</u>
< 4	0.40 - 2.5
4 - 7	0.50 - 2.0
8 - 15	0.60 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
> 200	0.85 - 1.18

ATTACHMENT 2

RESULTS OF GRAND GULF NUCLEAR STATION ANALYSIS OF CONFIRMATORY MEASUREMENTS
SAMPLES

<u>Isotope</u>	<u>NRC</u> <u>(pCi/mL)</u>	<u>Licensee</u> <u>(uCi/mL)</u>	<u>Resolution</u>	<u>Ratio</u> <u>(Licensee/NRC)</u>	<u>Comparison</u>
H-3	131.02	1.16E-04	20	0.885	Agreement
Sr-89	NDA	LLD	---	---	---
Sr-90	23.21	2.13E-05	20	0.918	Agreement
Fe-55	12.66	2.44E-05	20	1.927	Non-Agreement