



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

NOV 09 1984

Report No.: 50-416/84-39

Licensee: Mississippi Power and Light Company
Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-13

Facility Name: Grand Gulf 1

Inspection Conducted: September 24-28, 1984

Inspector: *G. R. Jenkins*
for R. H. Albright

11/5/84

Date Signed

Accompanying Personnel: A. C. Stalker, EG&G Idaho

Approved by: *G. R. Jenkins*

G. R. Jenkins, Section Chief
Division of Radiation Safety and Safeguards

11/5/84

Date Signed

SUMMARY

Scope: This routine, announced inspection entailed 31 inspector-hours at the site in the area of post accident sampling.

Results. No violations or deviations were identified.

REPORT DETAILS

1. Licensee Employees Contacted

- *J. E. Cross, General Manager
- *M. Wright, Acting Plant Manager-Operations
- *M. C. Williams, Chemistry and Radiation Control Superintendent
- *J. Vincelli, Radiation Control Supervisor
- *D. Oltmans, Acting Plant Chemist
- *L. F. Daughtery, Compliance Superintendent
- *J. E. Wallace, Supervisor, Radiological and Environmental Services
- *J. D. Bailey, Compliance Coordinator
- *A. Holbrook, Chemical Engineer
- *R. Ducker, Chemical Engineer
- *R. E. Brinkman, Health Physicist
- *G. O. Smith, Radiological and Environmental Services

NRC Resident Inspectors

- *J. Caldwell, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on September 28, 1984, with those persons indicated in paragraph 1 above. The inspector discussed with plant management an unresolved item* (Paragraph 4.d) concerning the capability to retrieve iodine and particulate samples downstream of the standby gas treatment filter system during an accident and the adequacy of the licensee evaluation that personnel could retrieve the samples and not exceed 5 rem. The Grand Gulf General Manager, during a telephone conversation on October 2, 1984, with P. Bemis of this office stated that prior to the plant start-up, the iodine and particulate sampler location would be relocated to an area that would be accessible in an accident situation. The Acting Manager-Operations, during a telephone conversation on October 5, 1984, requested that the date for the re-evaluation of dose rates to personnel retrieving the samples to be available for NRC review onsite be changed from October 9, 1984, to October 19, 1984. This change was acceptable due to relocation of the samplers.

Items related to the post accident sampling system (PASS) inspection (paragraph 4.c) were also discussed with licensee management.

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Post Accident Sampling Systems

- a. (1) NUREG-0737, Item II.B.3 establishes eleven criteria for the post accident sampling system. These criteria specify types of samples, sampling times, types, accuracies and sensitivities of sample analysis, exposure to operators and design considerations.
- (2) Technical Specification 6.8.3 requires a program which will ensure the capability to obtain and analyze reactor coolant, radioactive iodines and particulates in plant gaseous effluents, and containment atmosphere samples under accident conditions. The program shall include training of personnel, procedures for sampling and analysis, and provisions for maintenance of sampling and analysis equipment.
- (3) Through review of selected records, observation of sampling equipment operation, discussion with licensee representatives and inspection of the installed systems, the inspector verified that the post accident sampling requirements have been met except as noted in paragraph d, below.
- b. The following are the results of acceptable areas of the PASS inspection.
- (1) NUREG-0737, Item II.B.3 Criterion 1 states that the licensee shall have the capability to obtain and analyze reactor coolant and containment atmosphere samples within 3 hours.
- The licensee demonstrated the ability to obtain a reactor coolant and a containment atmosphere sample and complete analysis of each within a three hour time period.
- (2) NUREG-0737, Item II.B.3 Criterion 2 states that PASS samples shall not require an isolated auxiliary system to be placed in operation in order to use the PASS.
- The reactor coolant and containment atmosphere PASS are both completely independent systems that do not require an auxiliary system for their operation.
- (3) NUREG-0737, Item II.B.3 Criterion (2)(b) states that the licensee shall be able to measure hydrogen levels in the containment atmosphere.

A sample of the containment atmosphere was taken and analyzed with the following results:

	<u>PASS</u>	<u>Normal Sample Point</u>
H ₂	<0.1%	<0.1%

- (4) NUREG-0737, Item II.B.3 Criterion 3 states that personnel shall be able to obtain samples from the PASS and not exceed 5 Rem. whole body or 75 Rem to the extremities.

The PASS for reactor coolant and containment atmosphere sampling has been designed with sufficient shielding so that a sample can be obtained and analyzed without exceeding the respective doses. The system was installed per the design and there are no unreviewed safety questions.

- (5) NUREG-0737, Item II.B.3 Criterion 4 recommends analyses of reactor coolant for dissolved oxygen and pH.

The licensee measured the pH and dissolved oxygen in the reactor coolant with the following results:

	<u>PASS</u>	<u>Normal Sample Point</u>
pH	6.1	5.67
	5.9	5.77
O ₂	2.33 ppm	2.0 ppm

- (6) NUREG-0737, Item II.B.3 Criterion 8 states that if inline monitoring is used for any sampling and analysis capability, the licensee shall provide backup sampling through grab sampling.

The licensee has full diluted and undiluted grab sampling capability to back-up the inline analysis equipment. This capability was demonstrated.

- (7) The licensee has operating procedures that have been prepared, reviewed and approved in accordance with station requirements. A formalized training program has been established with written lesson plans and hands on training. Only two technicians have completed the training but all technicians are to be trained.

- c. The following are identified as Inspector Followup Items as a result of the PASS inspection:

- (1) At the time of the inspection, the reactor coolant and containment atmosphere did not have adequate concentrations of radioactive material to allow a comparison of the normal and PASS samples. The containment atmosphere sample line was heat traced but did not have good design features in that the line was long and had several bends which could cause deposition of particulates. The comparison of coolant and containment atmosphere samples for the normal sampling systems and from the PASS will be reviewed as an inspector followup item during a future inspection (416/84-39-01).

- (2) NUREG-0737 Item II.B.3 Criterion 2 states that the licensee shall establish an onsite chemical analysis capability to provide quantification of dissolved gases (e.g. H₂) in reactor coolant.

The sample volume of stripped gases, due to the current sizing of the gas flow meter in the stripped gas line, precludes accurate measurement of stripped gas isotopic and H₂ concentrations. The

NRC has recently accepted an evaluation by the G. E. Company that for a BWR the maximum dissolved gas in the coolant during an accident is 50 cc/kg. The new flow meter should be sized to measure gas flow rates in this range. The licensee had submitted a DCR to correct this prior to the inspection. Dissolved gases are not normally expected in the coolant; the inspector stated that the licensee should establish a method to functionally test the gas stripper. The licensee agreed to evaluate this. The above inspector followup item will be reviewed during a future inspection (416/84-39-02).

- (3) NUREG-0737, Item II.B.3 Criterion (5), states that the licensee shall establish chemical analysis capability to provide quantification of chlorides in the reactor coolant. The licensee measured the chloride content of the reactor coolant with the following results:

<u>PASS</u>	<u>Normal Sample Point</u>
Cl ⁻ <1ppm	<0.02 ppm

This analysis of the PASS sample is outside the minimum sensitivity needed for this analysis but the licensee has additional equipment on order which should correct this problem. This inspector followup item will be reviewed during a future inspection (416/84-39-03).

- (4) NUREG-0737, Item II.B.3 criterion (7), states that the licensee shall establish an onsite chemical analysis capability to provide quantification of boron in the coolant. The licensee measured the boron content of the diluted coolant with the following results:

<u>PASS</u>	<u>Normal Sample Point</u>
B <300 ppm	<50 ppb

The licensee is outside the minimum sensitivity needed for this analysis; however, additional equipment is on order which should correct this problem. This inspector followup item will be reviewed during a future inspection (416/84-39-03).

- (5) NUREG-0737, Item II.B.3 Criterion (11)(a) states that there should be provisions for purging sample lines. Criterion (11)(b) states that ventilation exhaust from the sample station should be filtered with charcoal and high-efficiency particulate air (HEPA) filters. The sample lines within the sample panel can be purged; however, the sample inlet lines cannot be purged. A design change

should be made to the PASS to provide the capability to purge the sample inlet line. The licensee was drafting a DCR to make this change prior to the inspection. This inspector followup item will be reviewed during a future inspection (416/84-39-04).

The PASS area ventilation exhaust is filtered through charcoal and HEPA filters; however, there was no test data to show that there will be flow into the sample area with the doors open. Licensee management acknowledged the need for the described test. This inspector followup item will be reviewed during a future inspection (416/84-39-05).

- (6) The ventilation exhaust from the sample panel area and the reactor coolant stripped gas is returned to the turbine building exhaust. The turbine building exhaust fans should be controlled administratively to ensure that the fans remain on during operation of the PASS. An evaluation of the radiological consequences of the stripped gas being released to the ventilation exhaust system instead of being returned to containment should be evaluated. This inspector followup item will be reviewed during a future inspection (416/84-39-06).
 - (7) The sample panel has a hatch per to contain leakage; however, the panel needs a sump to collect leakage and a pump and drain line. If leakage from the system should occur, a dose rate and contamination problem could result. Licensee management acknowledged the need for this design change. This inspector followup item will be reviewed during a future inspection (416/84-39-07).
 - (8) The licensee has a formal calibration and recalibration program for most components of the PASS. The functions of the automatic analysis capability that should be added to the monthly test are boron and chloride even though these are not normally found in BWR reactor coolant. The licensee will evaluate the need to add these functions to the monthly test. This inspector followup item will be reviewed during a future inspection. (416/84-39-08)
- d. The inspector discussed with licensee representatives the location of the post accident iodine and particulate samplers for the standby gas treatment system (SGTS). The samplers were located on elevation 245 on a mezzanine above the spent fuel pool. This area was not analyzed for potential dose rates after an accident. A review of FSAR section 12.6 did not indicate that the sampler location was an area that would have to be accessible for sample retrieval during an accident. The stairwell that would have to be traversed in order to retrieve the sample canisters also was not analyzed for dose rates. However, the dose rate maps for the accident situation indicated that the spent fuel pool floor area around a personnel access hatch into containment could have dose rates up to 500,000 R/hr. This area adjoins the stairwell with no significant shielding in between. In the event of an accident the samples might not be retrievable. The General Plant Manager in a telephone conversation with P. Bemis, of this office, on October 2, 1984,

stated that an alternate sampling location would be established prior to plant start-up. The new sample location will be accessible to plant personnel during an accident. During a telephone conversation on October 5, 1984, the Acting Manager-Operations requested that the date for the evaluation of accessibility of the initial sampler location to be available onsite for Region II NRC review be changed from October 9, 1984 to October 19, 1984. This change was acceptable due to the relocation of the samplers. The licensee's ability to retrieve the samplers from the previous location on the 245 ft. elevation is an unresolved item pending review of their shielding evaluation (416/84-39-09).