APPENDIX A

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-458/88-22 License NPF-47

Docket: 50-458

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

Facility Name: River Bend Station (RBS)

Inspection At: River Bend Station, St. Francisville, Louisiana

Inspection Conducted: August 29 through September 15, 1988

Inspectors: _____ 9/27/88
E. J. Ford, Senior Resident Inspector Date
Project Section C, Division of Reactor Projects

William B. Jones 9/23/88
W. B. Jones, Resident Inspector Date
Project Section C, Division of Reactor Projects

Approved: _____ 9/27/88
O. L. Constable, Chief, Project Section C Date
Division of Reactor Projects

Inspection Summary

Inspection Conducted August 29 through September 15, 1988 (Report 50-458/88-22)

Areas Inspected: Special, unannounced inspection of the fuel building ventilation charcoal filtration system.

Results: On August 29, 1988, GSU found that the switches for heaters in both trains of the fuel building (emergency) ventilation system filters were not on as required to fully meet system operability requirements.

During an emergency, the heaters keep the relative humidity of the incoming air below 70 percent to maintain the efficiency of the charcoal filters. It is not clear how long the heaters were off. Following automatic initiation of the ventilation system on August 25 and 27, 1988, system line ups were performed that should have ensured that the switches were in the proper position. Six shift turnover control board checks and two line up checks prior to mode changes should also have identified the inoperable condition of the heaters. Corrective actions from a similar event in 1986 were not complete at the time of this event.

Three potential violations (failure to maintain the fuel building ventilation charcoal filtration system operable, failure to conduct adequate shift turnovers, and failure to implement timely corrective action) were identified. An enforcement conference to discuss these potential violations will be held in the Region IV office at a time and date to be announced.

DETAILS

1. Persons Contacted

*J. C. Deddens, Senior Vice President, River Bend Nuclear Group
*L. A. England, Director, Nuclear Licensing
A. O. Fredieu, Supervisor, Operations
*P. D. Graham, Assistant Plant Manager, Operations
J. R. Hamilton, Director, Design Engineering
*L. G. Johnson, Site Representative, Cajun
*R. J. King, Supervisor, Nuclear Licensing
*V. J. Normand, Supervisor, Administrative Services
*W. H. Odell, Manager, Administration
*T. F. Plunkett, Plant Manager
*M. F. Sankovich, Manager, Engineering
*K. E. Suhrke, Manager, Project Management

The NRC inspectors also interviewed additional licensee personnel during the inspection period.

*Denotes those persons that attended the exit interview conducted on September 22, 1988.

2. Misaligned Fuel Building Charcoal Filtration System

This area of inspection was conducted to review the licensee identified problem with the misaligned switches for the fuel building ventilation charcoal filtration heaters (1HVF*FLT2AH(BH)). The NRC resident inspector was notified on August 29, 1988, that the heater breakers for the Division I and II fuel building ventilation charcoal filtration system was found in the off position. These breaker switches are located on Main Control Board Panel 1H13*P863. Heater status light indication is provided immediately above each of the heater breaker switches. However, placing the breaker switch to "STOP" will not actuate a control room annunciator. At the time of the discovery, the reactor was at 100 percent power. A reactor startup from operational condition 3 was initiated at 12:00 a.m. (CDT) on August 28, 1988, with Operational Condition 1 achieved at 12:29 p.m. (CDT). The heaters were identified by the licensee to be unavailable while preparing to perform a surveillance test on the fuel building exhaust filter trains. The heaters were immediately returned to operable status. The licensee's management and the NRC resident inspector were subsequently notified. Condition Report 88-0679 has been initiated to investigate the incident and effect corrective actions. As a result of the licensee's investigation and response to questions by the resident inspectors, the following information was obtained for the identified condition.

a. Identification and Cause for the Misaligned Heaters

- The licensee identified the misaligned heaters at 7:50 p.m. (CDT) on August 29, 1988, during the performance of Surveillance Test Procedure STP-406-0201, "Fuel Building Exhaust Filter Train Monthly Operability."

- When the heater breaker switches were identified as being improperly aligned, they were immediately returned to the correct position. Licensee management and the NRC resident inspector were then promptly notified of this condition. The licensee initiated an investigation to determine the reason the breakers were opened and what corrective actions should be taken. This investigation is being performed utilizing the condition report program and is being documented as Condition Report (CR) 88-0679. The licensee is also preparing a licensee event report to be submitted to the NRC within 30 days of the event.

- Two automatic initiations of the fuel building exhaust charcoal filtration trains occurred during the four days prior to discovery of the heater breakers being misaligned. The first initiation occurred at 12:32 p.m. (CDT), on August 25, 1988, when the reactor protection system (RPS) Division I bus deenergized during a reactor scram. The loss of the Division I RPS bus initiated both trains of the fuel building exhaust charcoal filtration system. This system was subsequently restored to its normal lineup and an entry made in the control room log at 5:02 a.m. (CDT) on August 26, 1988, that a complete board walkdown was performed of the at-the-controls area to verify proper system lineup for plant conditions. The second automatic initiation of this system occurred at 2:51 a.m. (CDT), on August 27, 1988, when an instrumentation and control (I&C) technician lifted an incorrect lead on the fuel building exhaust radiation monitor, RMS*RE5B, causing the fuel building ventilation system to align to the emergency filtration trains. An entry in the control room log at 3:32 a.m. (CDT) indicates that the fuel building ventilation system was restored to its normal lineup and that a second licensed operator verified the lineup to be correct.

- A final board walkdown was apparently completed between the hours of 6 a.m. and 6 p.m. on August 27, 1988, prior to the licensee entering Operational Condition 2. A licensed operator and control operating foreman have stated that they verified the fuel building ventilation system to be properly aligned during a main control board walkdown in preparation for entering Operational Condition 2. The performance of this main control board walkdown however was not documented in the control room log

book or the General Operating Procedure GOP-0001, "Plant Startup", which provides the master startup checklist for entry into Operational Condition 2.

- The licensee has interviewed each of the operating crews who were on shift from the time the reactor scram occurred on August 25, 1988, to the time the heater breakers were found open on August 29, 1988. Process computer data was also reviewed to try to determine when the heaters were taken out of service. To date, the licensee's review of this event has been inconclusive in determining when the heater breakers were opened.

- Manually placing the heater breaker switches to "STOP" will not generate a control room alarm other than the light status indication immediately above the breaker control switches. The other signal that will open the 1HVF*FLT2AH(BH) breakers is an overcurrent trip however this trip will cause an annunciator in the control room. The licensee has verified that the applicable control room annunciators are operating properly.

- The licensee's routine operations shift turnovers failed to detect that the heater control breaker switches were in the off position. The licensee conducts shift turnovers twice daily at 6:00 a.m. and then again at 6:00 p.m. This provided for a total of six shift turnovers from the time the heater breakers were last documented to have been properly aligned to the time they were discovered in the open position. The licensee had in place during this period, Operations Support Procedure OSP-0002, "Shift Relief and Turnover." This procedure requires that each licensed operator, prior to assuming licensed duties, review plant evolutions, equipment status, significant limiting conditions for operations status, night orders, standing orders and complete a walkdown of the main control board. The licensed operators who are required to perform these tasks are the shift supervisor, control operating foreman, at-the-controls operator and unit operator.

b. Potential Violation/Safety Significance

- River Bend Station Technical Specification 3.6.5.6 requires that two independent fuel building ventilation charcoal filtration subsystems be operable in Operational Conditions 1, 2 and 3. The associated ACTION statement, 3.6.5.6.a, only provides for one division of the fuel building ventilation charcoal filtration subsystem being inoperable in OPERATIONAL CONDITIONS 1, 2 and 3.

- River Bend Station Technical Specification 3.0.3 requires, in part, that when a Limiting Condition for Operation is not met, except as provided in the associated ACTION requirements, action

shall be initiated within 1 hour to place the unit in a OPERATIONAL CONDITION in which the Specification does not apply by placing it, as applicable, in:

(1) At least OPERATIONAL CONDITION 2 within the next 6 hours,

(2) At least OPERATIONAL CONDITION 3 within the following 6 hours, and

(3) At least OPERATIONAL CONDITION 4 within the subsequent 24 hours.

- In addition, River Bend Technical Specification 3.0.4 prohibits entry into an OPERATIONAL CONDITION or other specified condition unless the conditions for the Limiting Condition for Operation are met without reliance on provisions contained in the ACTION requirements.

- The charcoal filter heaters are designed to actuate when the fuel building emergency ventilation system is operated in the emergency mode.

- The emergency filtration mode of the fuel building ventilation system is initiated by a loss of coolant accident signal, detected high radiation in the fuel building exhaust duct or manually.

- The charcoal filter subsystem is designed to remove 99 percent of elemental iodine and 99 percent of the methyliodine provided the filtered air is maintained at 70 percent or less relative humidity (RH).

- The charcoal filter heaters actuate when the emergency fuel building ventilation system actuates to maintain the (RH) at or below 70 percent by heating the air entering the charcoal filters.

- With the heater breaker switches open as identified on August 29, 1988, the heaters would not actuate as required.

- The licensee has taken RH readings in the fuel building and determined that the average RH readings are between 65 and 70 percent. An engineering analysis documented in Memorandum ED-88-1023, dated September 9, 1988, concludes that there is no postulated accident which will result in higher relative humidities in the fuel building.

- The licensee has performed a bounding calculation for the fuel building radiation release with the charcoal filters functioning at 97 and 0 percent efficiencies during a loss of coolant accident. The subsequent exclusion area boundary 2-hour thyroid

dose exposures were determined to add less than 1 REM and 6 REM, respectively, to the release doses. The resulting thyroid dose exposures have been determined to be less than the 10 CFR 100 limit of 300 REM.

The failure to maintain the Division I and II fuel building ventilation charcoal filtration systems operable as required by River Bend Station Technical Specification 3.6.5.6 was identified by the resident inspectors as a potential violation. This failure to maintain both filter heaters operable also resulted in the licensee not meeting the requirements of River Bend Station Technical Specifications 3.0.3 and 3.0.4. A second potential violation involving failure to perform adequate shift turnovers was also identified. Six shift turnovers were conducted from the time the fuel building charcoal filtration heaters were last documented to be available to the time they were identified as being inoperable because of the improper switch positions. In accordance with OSP-0002, "Shift Relief and Turnover," the shift supervisor, control operating foreman, unit operator, and the at-the-controls operator are each required to complete a board walkdown prior to assuming the shift. This resulted in at least 24 separate occasions where the improper switch positions could have been identified by a licensed reactor operator.

c. Similar Occurrences

On July 1, 1986, the licensee identified in Condition Report (CR) 86-0875, an event where the control building Division I filter train heater failed to energize. A manual reset temperature switch was found open, however, since there are no alarms or indications associated with the filter trains heater circuit, no annunciator alarm was received when the temperature switch opened.

As part of the corrective actions for CR 86-0875, two modification requests (MRs) were initiated to add alarms to the control building and fuel building filter trains to annunciate when the heater's control circuits deenergize. These MRs are identified as MR 86-1213 and MR 86-1214 for the control building and fuel building ventilation filter trains respectively. The MRs suggest a solution to add a relay to the control circuit that drops out when the heater circuit is deenergized and gives an alarm in the main control room.

On April 9 and 23, 1988, MRs 86-1213 and 1214 were respectively cancelled by memorandums. A reply to interoffice memorandum dated May 16, 1988, concerning MRs 86-1213 and 1214, states that cancellation of the subject MRs will not conflict with the final disposition of CR 86-0875. It should be noted that on June 16, 1988, Quality Assurance Engineering returned the MR 86-1214 package to Design Engineering because of the unsatisfactory response. The response had indicated the cancellation of the MR would not affect final disposition of CR 86-0875. The failure to fully implement the

corrective actions identified in CR 86-0875 appears to be a violation of 10 CFR 50, Appendix B, and the licensee's QA program in that timely corrective action to prevent future occurrence was not taken.

A review of licensee event reports did not reveal any other similar occurrences as identified in this special inspection report.

d. Licensee Review of Existing Program Controls/Planned Corrective Action

The licensee has reviewed the programmatic controls and hardware systems in place during the period the potential violations occurred. As a result, additional programmatic controls and hardware modifications have been, or will be, implemented.

- The licensee has revised Operations Support Procedure OSP-0002, "Shift Relief and Turnover," Revision 4, to incorporate a unit operator main control board walkdown checksheet. This checksheet is completed by the unit operator prior to assuming licensed duties. This checksheet is subsequently reviewed by the shift supervisor as early in the shift as possible. This procedure change was incorporated into OSP-002 utilizing Temporary Change Notice TCN 88-0575.

- The licensee is also revising General Operating Procedure GOP-0001, "Plant Startup," Revision 8, to provide a workable startup checksheet that verifies the proper position of safety-related controls and correct instrument indications for startup from hot shutdown. This checklist is being developed from the existing station operating procedures utilizing selected control board lineups and instrument indications.

- Resurrecting Modification Requests (MR) 86-1213 and 1214 or initiating new MRs to provide control room annunciator alarms if the control building and fuel building ventilation charcoal heater's control circuitry are not available is being reviewed.

- The training department is reviewing exercises that can be incorporated into the simulator training classes to aid the reactor operators in identifying abnormal control board lineups.

- The operations supervisor issued a memorandum on September 9, 1988, to all operations personnel discussing the event, corrective actions that are being taken and the requirement for all operators to perform thorough shift turnovers and control board walkdowns.

- The resident inspector observed the Assistant Plant Manager-Operations meeting with one of the operating crews to discuss the significance of the event and their responsibilities for understanding plant conditions when they assume the shift.

The licensee will document their investigation of this problem and planned corrective actions in a licensee event report. The resident inspectors are monitoring the completion of licensee committed actions and observing selected shift turnovers.

3. Exit Interview

An exit interview was conducted with licensee representatives (identified in paragraph 1). During this interview, the RI reviewed the scope and findings of the report.