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NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

GULF STATES UTILITIES COMPANY

RIVER BEND STATION, UNIT 1

DOCKET NO 50-458

1.0 INTRODUCTION

The River Bend Station uses Mississippi River water for its non-safety related service water system. This system is separate from the ultimate heat sink which is composed of a seismic Category 1 concrete cooling tower and basin. Despite the fact that water for the service water system is initially passed through settling tanks to remove silt and sediment, the River Bend facility has had a long history of operational problems with this system. Over the years the licensee has experienced problems with corrosion product buildup, microbiologically induced corrosion (MIC), pinhole leaks, localized pitting, degraded flow (e.g., fouling of valve seats, general corrosion product buildup obstructing flow, and blockage of heat exchanger tubes), and mud and silt accumulation within the service water system.

As a result of the above problems, the licensee has undertaken a major activity to convert the current service water system from an open cycle to a closed cycle system. This activity, which is currently ongoing while the facility is shutdown for its fourth refueling outage, will consist of off-line chemical cleaning of the piping system, selected pipe/valve/component replacement/refurbishment, selected mechanical cleaning, closing of the system, and implementation of an aggressive water treatment program to significantly reduce corrosion rates and impact of MIC. The overall objective will be to restore the health of the service water system so that normal maintenance will be sufficient for the remaining life of the facility. The licensee's schedule calls for closing the system in early June 1992.

In a separate activity, the licensee has been required to take action to control biofouling within the service water system. NRC Bulletin 81-03, "Flow Blockage of Cooling Water to Safety System Components by Corbicula Sp. (Asiatic Clams) and Mytilus Sp. (Mussel)," resulted in the licensee instituting a program to prevent biofouling of safety-related equipment. Included in this program is a requirement for continuous chlorination of the service water system to control Corbicula. This is enforced through Technical Specification 6.8.4.d which states that a Biofouling Prevention and Detection program shall be operational and that any changes to this program must be submitted to and approved by the NRC.

By letter dated March 4, 1992, the licensee requested to change their Biofouling Prevention and Detection program by eliminating the requirement for continuous chlorination. The basis for this change is that a closed system should eliminate Corbicula as a concern and that residual chlorine in the system would chemically react with the planned corrosion inhibitors thus reducing the corrosion inhibiting properties and causing an overall degradation to the system.

2.0 EVALUATION

River Bend Station's Technical Specification 6.8.4.d, Biofouling Prevention and Detection requires:

"A program which will include the procedures to prevent biofouling of safety-related equipment, to assure detection of Corbicula in the intake embayment and the clarifier influent, and to monitor and survey safety-related equipment to detect biofouling. Changes to this program will be submitted to and approved by the NRC (both the Region and NRR) prior to implementation."

The staff has reviewed this issue in order to determine the need for future chlorination and thus the acceptability of the licensee's request. In addition, the staff needed to verify that a program for biofouling prevention and detection will continue to exist such that there will be no changes to the technical specifications.

Once the service water system is cleaned and passivated, the licensee will isolate it from the circulating water system. The service water system will thereafter use buffered demineralized water for makeup with a non-oxidizing biocide. The service water system will still interface with the ultimate heat sink as before. However, the ultimate heat sink's inventory is made up from deep well water and the licensee will use a non-oxidizing biocide in it to prevent the onset of MIC and minimize the chances of biofouling.

With regard to maintaining a biofouling prevention and detection program, the licensee has committed to maintain a program to include procedures to prevent biofouling of safety-related equipment, to assure detection of Corbicula in the intake embayment and clarifier influent, and monitor and survey safety-related equipment to detect biofouling. The only change will be to delete chlorination to 0.6 ppm in the service water system.

3.0 CONCLUSION

Based on the above information, the staff (both NRR and Region IV) concludes that chlorination of the service water system will no longer be necessary and that the proposed modification to the Biofouling Prevention and Detection program does not represent a change to the Technical Specifications. Therefore, the staff finds the licensee's proposal acceptable.

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