

April 19, 1993

U.S. Nuclear Regulatory Commission
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Washington, DC. 20555

Subject: River Bend Station - Unit 1
Docket No. 50-458
NRC Bulletin 93-02, Supplement 1

File No: G9.5, G9.33.1
RBG- 40512

Gentlemen:

This letter provides a response to Supplement 1 of NRC Bulletin 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers." River Bend Station (RBS) is a General Electric (GE) BWR-6/Mark III and utilizes a suppression pool similar to that of the plants which were identified in the bulletin. In response to this issue RBS formed a task force which corresponded with the subject plants and actively participate in the BWR Owners Group (BWROG) to resolve this issue.

The actions requested by the supplement include training of operators and emergency response personnel on this issue, process reviews to mitigate or compensate for strainer plugging and other plant measures which will increase the availability of core and containment cooling. Efforts have begun on the requested actions with the exception of containment sprays, which RBS does not have.

In the initial response to Bulletin 93-02 (RBG-38617 dated June 8, 1993), RBS described various efforts to reduce the possibility of strainer plugging. Also, RBS has increased management attention to containment housekeeping associated with suppression pool cleanliness. As part of the Suppression Pool Cleanliness Program, RBS has implemented a policy to visually inspect the ECCS suction strainers located in the suppression pool for debris during each cold shutdown greater than 10 days.

JEH 11

NRC Bulletin 93-02, Supplement 1

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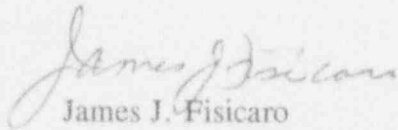
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As requested in the bulletin supplement, RBS will submit a final response confirming completion of requested action on or before June 18, 1994.

If you have any questions or comments, please contact Mr. O. P. Bulich of my staff at (504) 336-6251.

Sincerely,



James J. Fisicaro

Director - Nuclear Safety

cc: U. S. Nuclear Regulatory Commission
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BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

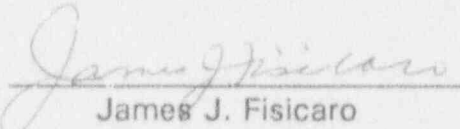
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DOCKET NO. 50-458

IN THE MATTER OF
GULF STATES UTILITIES COMPANY
CAJUN ELECTRIC POWER COOPERATIVE AND
ENERGY OPERATIONS, INC.

AFFIRMATION


I, James J. Fisicaro, state that I am the Director-Nuclear Safety of Entergy Operations, Inc., at River Bend Station; that on behalf of Entergy Operations, Inc., I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this response requesting information regarding NRC Bulletin 93-02, Supplement 1, for River Bend Station; that I signed this request as Director-Nuclear Safety at River Bend Station of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information, and belief.


James J. Fisicaro

STATE OF LOUISIANA
WEST FELICIANA PARISH

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the Parish and State above named, this 19th day of April, 1994.

(SEAL)


Notary Public

ATTACHMENT 1

Bulletin 93-02, Supplement 1 describes NRC staff concerns related to potential common-mode failure of Emergency Core Cooling Systems (ECCS) due to suction strainer plugging. The bulletin requests licensees implement certain interim actions pending final resolution of this issue. The following is River Bend Station's (RBS) response to this bulletin.

Action Requested

Provide training and briefings to apprise operators and other appropriate emergency response personnel of the information contained herein and in the referenced information notices regarding the potential for suppression pool strainer clogging.

RBS Response

Operators are kept informed of industry-wide concerns via the current training program. Specific training materials have been prepared which provide the Operations staff with an overview of applicable portions of the information notices referenced in the bulletin supplement, and apprise them of the concerns related to this issue. A site-specific review of debris types and transport mechanisms was included. Also, the training material includes information about indications available to the operator to detect ECCS suction strainer blockage and strategies to mitigate the event.

Operations crews have begun training using this material. The appropriate Emergency Response personnel have also been identified and will be trained using the same information provided to the operations crews. Training of appropriate operations and emergency response personnel will be completed within 90 days of the date of the bulletin as requested.

Action Requested

Assure that the emergency operating procedures make the operator aware of possible indications of ECCS strainer clogging and provide guidance on mitigation.

RBS Response

Emergency Operating Procedures (EOPs) at RBS are symptom rather than event-based and are consistent with guidance provided by the BWR Owner's Group (BWROG) Emergency Procedure Guidelines, Revision 4. Through use of these procedures the operator responds to symptoms without the need to diagnose specific events. These procedures lead the operator to alternate sources of water for any declining reactor vessel water level event such as the postulated blockage of the ECCS suction strainers.

The operator has indications available to him (i.e. flow rate, pump motor amps, and water level indication) to monitor performance of ECCS systems. Although pump suction pressure indication for the four low pressure ECCS systems [3 Residual Heat Removal (RHR) , 1 Low Pressure Core Spray (LPCS)] is not directly available to the operator in the main control room, indication of system suction pressure degradation should be available via monitoring these other parameters before pump failure. Additionally, systems would not be expected to degrade uniformly or to fail simultaneously; therefore, loss of the first pump, should it occur, would alert the operator to a potential failure of the remaining pumps.

Indication of pump suction pressure for the High Pressure Core Spray System (HPCS) and the Reactor Core Isolation Cooling System (RCIC) is available to the operator in the main control room. Also, low suction pressure of these systems is annunciated and RCIC automatically trips on a low suction pressure condition. However, since both systems are normally aligned to the Condensate Storage Tank (CST), they are not subject to a decrease in suction pressure due to strainer plugging until the transfer to suppression pool suction occurs. During that time considerable settling of debris in the suppression pool would be expected. Also, the EOPs provide guidance to the operator to maintain these systems aligned to the CST, whenever possible. This line-up is emphasized in the current training being provided to the operators.

Additional precautions are being added to the System Operating Procedures (SOPs) for the ECCS systems. The precautions provide additional information to the operators relative to the indications of potential strainer plugging. These changes will be complete by May 16, 1994.

Based on the operator training and the SOP changes described above, changes to the EOPs are not required. This position is consistent with the latest BWROG Emergency Procedures Committee recommendations on this issue. However, a more detailed review of procedures with respect to this issue is being performed. Should this review indicate that additional guidance is warranted, this information will be provided in the final response to this bulletin supplement.

Action Requested

Institute procedures and other measures to provide compensatory action to prevent, delay, or mitigate a loss of available NPSH margin under LOCA conditions. Such measures should be consistent with providing the design basis emergency system functions for core and containment cooling. Actions to assure sufficient core and containment cooling may include:

- Reduction of flow (consistent with delivering the required ECCS flow) through the strainers to reduce head loss and extend the time for debris deposition

RBS Response

Current procedures direct the operator to maintain reactor vessel water level between 9.7 inches and 51 inches. Securing pumps or reducing flow is allowed if level can be maintained within this band. The operator is directed to inject, irrespective of NPSH limits, if level is below the top of active fuel (TAF). Also, the possibility of reducing flow or alternating divisions within the constraints of these procedures is discussed during training.

- **Operator realignment of existing systems to allow back flushing of clogged strainers**

RBS Response

Existing SOPs contain a specific precaution against back flushing ECCS systems due to concerns about damaging the suction strainers. Efforts are currently underway to reevaluate this precaution. Also, a change to the SOPs to allow back flushing in emergency situations is under review. Based on the results of this review, SOP changes may be initiated to provide operator guidance for aligning the Condensate Storage and Transfer system pumps to allow back flushing via the normal filling and flushing connections. The results of this review and/or a schedule for completion of the procedure changes will be provided in the final response to this bulletin.

- **Operator realignment of existing systems to allow injection to the core from water sources other than the suppression pool**

RBS Response

HPCS and RCIC are normally aligned to the CST as discussed above. Per BWROG document BWROG-94034, dated March 24, 1994 and General Electric (GE) document DRF A00-05845, HPCS can provide adequate core cooling for any size LOCA. The Reactor Level Control section of the EOPs directs the operator to maintain HPCS and RCIC aligned to the CST, whenever possible. Operators may override the auto-swap of HPCS and RCIC suction paths to the suppression pool on suppression pool high level via manual override of suction valves from the control room for HPCS and via an EOP enclosure for RCIC. Primary Containment Control/Suppression Pool Level Control procedure EOP-2 allows this line until a determination is made that the suppression pool cannot be restored and pool level maintained below 21 feet. At that time EOP-2 instructs the operator to determine if adequate core cooling is assured without systems taking suction from a source external to the containment. If the answer is yes, the operator is directed to terminate injection with sources external to the containment except boron and Control Rod Drive (CRD).

The EOPs also provide guidance on a number of other available injection sources into the reactor vessel which take suction from sources other than the suppression pool. These include CRD, condensate/feedwater, service water via RHR cross-tie, condensate transfer, fire system, Standby Liquid Control (SLC) test tank and SLC boron tank.

The service water/ RHR cross-tie can be initiated rapidly by the operator from the main control room. The pumps and valves required for this alignment are safety-related, receive class 1E power and are tested periodically as part of the Inservice Test program. These aspects assure a high degree of reliability and availability.

- **Intermittent operation of the containment sprays, when possible, to reduce the transport of debris to the strainers**

RBS Response

RBS does not have a containment spray system. Therefore, this method of debris transport to the suppression pool and ultimately the suction strainers does not exist at RBS. Also, RBS has determined that no other transport mechanism other than line breaks exists.

- **Other plant-specific measures which assure availability of sufficient core and containment cooling to meet the design basis of the plant**

RBS has a number of design features as well as initiatives to mitigate the probability of a LOCA and to assure ECCS system availability should a LOCA occur. These include:

- In addition to the four low pressure ECCS systems and HPCS and RCIC systems discussed previously, RBS has a safety-related leak detection system to detect drywell and containment leakage. Technical Specifications (TS) require the leak detection system to be operable in Modes 1,2 and 3. Also, TS impose limits of 5 gpm unidentified leakage, total leakage of 25 gpm, and unidentified leakage increase of 2 gpm in a 24-hour period unless the leakage originates from non-IGSCC susceptible material.

RBS USAR Section 5.2 provides a discussion of critical crack length and calculated leakage flow rates. In every case, the leak rate from a crack of critical size is significantly greater than the 5 gpm TS limit. If either the total or unidentified leak rate limits are exceeded, an orderly shutdown can be initiated and the reactor placed in cold shutdown within 24 hours. The unidentified leak rate limit is based, with an adequate margin for contingencies, on the crack size large enough to propagate rapidly. The estimated limit is sufficiently low that, even if the entire unidentified leakage is from a single crack in the nuclear system process barrier, corrective action can be taken before barrier integrity is threatened (i.e., leak before break).

- During the current Refueling Outage which began on April 16, 1994, RBS has scheduled performing Mechanical Stress Improvement on IGSCC-susceptible vessel nozzles to safe-end welds and safe-end extensions > 4 inches in diameter.
- Operations Policy #17 directs plant personnel regarding control and use of temporary materials inside the containment during power operations. Such controls will minimize the amount of transportable material brought into and left in the pool swell area of the containment.
- An engineering evaluation performed on ECCS strainer plugging indicates that the amount of strainer blockage during accident conditions is less than the strainer design capacity.
- RBS has revised the Inservice Test program for the low pressure ECCS systems to require a 6-hour run once each year for each system while periodically monitoring suction pressure. Such testing is not required for HPCS since it has direct pump suction pressure indication, as noted above. Procedure revisions will be completed prior to next performance of each surveillance test. The new tests will help detect any buildup of debris on the suction strainers during normal operations which could impact the NPSH available to the pumps
- Periodic Inservice Inspection (ISI) examinations are performed on the higher stressed weld locations.
- Feedwater piping inside the drywell is periodically monitored for wall thinning as a part of the RBS erosion/corrosion program. Main steam piping outside the containment in areas subject to greatest wall thinning is also monitored.
- RBS plans to perform a detailed inspection of the suction strainers using divers near the end of RF-5 to ensure no blockage is occurring. Any identified debris dropped into the pool during the outage will be removed at that time as well.
- As a result of concerns raised by an NRC Operational Safety Team Inspection, RBS performed a detailed walkdown of the containment, removing any loose debris which could be removed. An evaluation to determine acceptability was performed on all remaining material.
- Administrative Procedure, ADM-0018, "Plant Housekeeping and Cleanliness Control," implements "zone inspections" to establish and maintain high levels of cleanliness and material condition throughout the plant.

The initiatives and systems described above, in combination with identified procedure changes and operator and emergency response personnel training provide assurance that RBS systems/components will provide the necessary core cooling following a postulated loss of coolant accident.