GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Please find attached information regarding Gulf States Utilities Company's (GSU) amendment request dated September 30, 1988 (reference RBG-28910). GSU's letter requested the amendment of Facility Operating License NPF-47, Attachment A, Technical Specifications, to implement NRC Generic Letter 87-09.

This submittal contains the justifications for preplanned use of the additional operating flexibility allowed by the application of the proposed change to Specification 3.0.4 based on guidance provided in Generic Letter 87-09 (GL 87-09). These changes were initially submitted on September 30, 1988 (RBG-28910) and supplemented on June 6, 1990 (RBG-32951). If the referenced amendment request is approved by the NRC the preplanned use of this flexibility does not require a change to the license and therefore no amendment request is required. GSU request this submittal be evaluated based on the GL 87-09 submittals. This request will provide significant improvement in the upcoming refueling outage, therefore, GSU requests this change reviewed by August , 1990.

Please contact Mr. L. A. England at (504) 381-4145 if additional information is required.

Sincerely,

W. H. Odell
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Manager-Oversight
River Bend Nuclear Group

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Attachment



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## ATTACHMENT

This attachment provides the justifications for preplanned use of the additional operating flexibility allowed by the application of the proposed change to Technical Specification (TS) 3.0.4 to the action statements of TS 3.4.9.2 and 3.9.11.2. During refueling outages at River Bend Station (RBS) various combinations of residual heat removal (RHR) shutdown cooling mode subsystems, emergency core cooling systems (ECCS), and standby service water subsystems are made inoperable to perform required maintenance, surveillance testing and inspections. These activities require the plant to enter action statements for these systems at various times during the outage. Preplanned use of the proposed change to TS 3.0.4 will allow the plant to enter Operational Conditions 4 and 5 by allowing reactor vessel head tensioning and detensioning and allow reactor cavity flooding and draining while complying with these action statements. With the present technical specification requirements, the above activities would have to be suspended during a change in operational conditions in order to make the systems operable as required by the LCO. After completing the change in operational conditions, the systems would again be made inoperable and the action statements entered to complete the required maintenance and testing activities.

The current schedule for the third refueling outage relies upon approval of the allowance to utilize the proposed change to TS 3.0.4 on a preplanned basis for the action statements of TS 3.4.9.2 and 3.9.11.2. The following provides the basis for the acceptability of preplanned use of this flexibility.

Under normal circumstances with the reactor in a shutdown condition, the decay heat produced by the irradiated fuel in the reactor vessel is removed by the shutdown cooling mode the residual heat removal (RHR) system. Each shutdown cooling mode loop of RHR utilizes a RHR pump and two RHR heat exchangers to remove the decay heat from the reactor vessel and transfers it to the normal or standby service water system. As stated in the bases for TS 3.4.9.1 and 3.4.9.2, a single shutdown cooling mode loop provides sufficient heat removal capability for removing core decay heat and provides adequate coolant mixing to assure accurate temperature indication. However, single failure considerations require that two loops be operable or that alternate methods capable of decay heat removal be demonstrated for each inoperable loop.

TS 3.4.9.1 and 3.4.9.2 require two shutdown cooling mode loops of the RHR system to be operable and, unless at least one recirculation pump is in operation, at least one shutdown cooling mode loop to be in operation. TS 3.4.9.1 is applicable in Operational Condition 3 (HOT SHUTDOWN) with reactor vessel pressure less than the RHR cut-in permissive setpoint and TS 3.4.9.2 is applicable in Operational Condition 4 (COLD SHUTDOWN).

When in Operational Condition 5 (REFUELING) with irradiated fuel in the reactor vessel, TS 3.9.11.1 or 3.9.11.2 applies depending on the water level in the reactor cavity. TS 3.9.11.2 applies with the reactor cavity water level less than 23 feet above the top of the reactor pressure vessel flange and requires two shutdown cooling mode loops of the RHR system be operable with one in operation. No allowance is made here for coolant circulation with an operating recirculation pump. TS 3.9.11.1 applies with the reactor cavity water level greater than or equal to 23 feet above the top of the reactor pressure vessel flange and requires at least one shutdown cooling mode loop of the RHR system be operable and in operation (again, no provision for coolant circulation with an operating recirculation pump).

The bases for TS 3.9.11.1 and 3.9.11.2 state that the requirement for at least one RHR loop to be operable and in operation or that an alternate method capable of decay heat removal be demonstrated and an alternate method of coolant mixing be in operation ensures that: (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140 degrees F as required during REFUELING, and (2) sufficient coolant circulation would be available through the reactor core to assure accurate temperature indication and to distribute and prevent stratification of the neutron poison in the event it becomes necessary to actuate the standby liquid control system. These bases go on to state that the requirement to have two shutdown cooling mode loops operable when there is less than 23 feet of water above the reactor pressure vessel flange ensures that a single failure of the operating loop will not result in a complete loss of residual heat removal capability. With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling. Thus, in the event of a failure of the operating RHR loop, adequate time is provided to initiate alternate methods capable of decay heat removal or emergency procedures to cool the core.

Entry into Operational Condition 3 with reactor vessel pressure less than the RHR cut-in permissive is currently allowed by TS 3.4.9.1 Action c which states that the provisions of TS 3.0.4 are not applicable. This action (along with a footnote on TS 3.5.1 which allows one low pressure coolant injection (LPCI) loop to be placed in the shutdown cooling mode) allows reactor vessel pressure to be reduced below the RHR cut-in permissive before placing one RHR shutdown cooling mode loop into operation and hence, restoring compliance with the LCO. Because the exception to TS 3.0.4 is placed as Action c and not as part of Action b, entry into this specified condition is also currently permitted with less than the required number of RHR shutdown cooling mode loops operable. The basis for this allowance is provided below.

Action a of TS 3.4.9.1 provides the necessary actions to be taken in the event one or more RHR shutdown cooling mode loops are inoperable and Action b provides the necessary actions to be taken in the event no RHR shutdown cooling mode loop or recirculation pump is in operation. While in Action a or b, action must be taken to restore the RHR loop to operable status or operation, as applicable, as soon as possible. Additionally, it is required to provide an alternate method for the function of the RHR shutdown cooling mode loop(s) required by the LCO (heat removal capability or coolant circulation, as applicable) within one hour. These alternate methods provide a means to completely replace the function(s) of the RHR shutdown cooling mode loop(s) required by the LCO and as such, preserves the ability to cope with a single failure without loss of safety function. Additionally, the change in specified conditions has no effect on decay heat generation or removal capability. Further, TS 3.5.1 requires all ECCS to be operable while in Operational Conditions 1, 2 and 3.

As stated in GSU's letter dated December 16, 1988 (Reference RBG-29573), credit for meeting these action requirements can only be taken if the alternate method(s) chosen has enough decay heat removal capacity for the plant condition at that time. Approved alternate methods available include: a RHR shutdown cooling mode loop that cannot be declared operable because of an overdue surveillance test, RHR-LPCI mode, reactor water cleanup system and control rod drive system flow. Any combination of these systems may be used to provide the decay heat removal capacity required to qualify as an alternate to the RHR shutdown cooling mode loop required by the LCO, depending upon the reactor core decay heat being generated at that time. Additionally, as discussed in Updated Safety Analysis Report (USAR) Section 5.4.7.1.5, in the event the capability of the RHR shutdown cooling mode is lost due to either of the two shutdown cooling supply valves failing to operate, an operator would be sent out to operate the valve manually. If this is not feasible and the plant must be shut down as soon as possible, the alternate shutdown method is employed. In this procedure, water is drawn from the suppression pool, pumped through the RHR heat exchanger and delivered into the shroud region of the reactor. The vessel water is allowed to overflow the steam lines and discharges back to the suppression pool via the automatic depressurization system (ADS) valve discharge lines. A complete loop is thereby established, with sensible and decay heat being transferred to the suppression pool and then to service water via the RHR heat exchanger.

Conservative calculations of decay heat removal requirements have been performed using a computer code that utilizes the algorithm in Section 3.6 of ANSI/ANS 5.1-1979. The results of this calculation are contained in Surveillance Test Procedure (STP)-204-0700, "Alternate Decay Heat Removal Verification". This procedure contains a curve which is utilized to conservatively determine the decay heat removal requirements for the particular plant condition based upon time after shutdown. After determining the decay heat removal requirements, the alternate method(s) is selected from a table which provides approved alternate methods and their heat removal capacities. After placing the approved alternate method in service, the operator is required to verify that the alternate method is removing the reactor decay heat being generated. These actions ensure that the method chosen is capable of completely replacing the heat removal function of the RHR shutdown cooling mode loop required by the LCO.

Alternate methods for coolant circulation include operation of: one or both recirculation pumps, or establishing natural core circulation by increasing reactor water level while in Operational Condition 5, or operation of the reactor water cleanup system in conjunction with maximum control rod drive system flow. These methods have been shown to provide adequate coolant circulation in order to prevent temperature stratification and permit accurate temperature monitoring.

TS 3.5.2 requires at least two ECCS to be operable in Operational Conditions 4 and 5. However, the ECCS are not required to be operable with the reactor vessel head removed, the reactor cavity flooded, the upper containment fuel pool gate open and water level maintained greater than or equal to 23 feet above the top of the reactor pressure vessel flange. Application of the operational flexibility allowed by the proposed change to TS 3.0.4 with the unit shut down will still require at least one ECCS to be operable and will not allow any operations with a potential for draining the reactor vessel to be in progress during a change in operational conditions.

The action requirements of TS 3.4.9.2, which are applicable in Operational Condition 4, are the same as those discussed above for TS 3.4.9.1, except for the requirement to restore compliance with the LCO as soon as possible. These actions also require establishing an alternate method for the function(s) of the RHR shutdown cooling mode loop(s) required by the LCO within one hour. Since a period of time has elapsed to achieve Operational Condition 4, there is less decay heat being generated by the core and therefore, there is less urgency needed in restoring the RHR shutdown cooling loop. The alternate method(s) completely replaces the function(s) of the RHR shutdown cooling mode loop(s) required by the LCO and therefore, provides for safe continued operation. Additionally, the change in operational conditions by cooling down has no effect on decay heat generation or removal capability.

TS 3.4.9.2 does not currently contain an exception to the provision of TS 3.0.4. Based upon the above considerations that less decay heat is being generated in COLD SHUTDOWN, the fact that the specific function(s) of the RHR shutdown cooling mode loop(s) required by the LCO is being completely replaced by the alternate method(s) and that at least one ECCS is operable, a change in plant conditions to Operational Condition 4 should be allowed while complying with the action requirements of TS 3.4.9.2.

The action requirements of TS 3.9.11.2, which are applicable in Operational Condition 5 with reactor cavity water level less than 23 feet above the top of the reactor pressure vessel flange, are the same as those discussed above for TS 3.4.9.2, with the exception that an operating recirculation pump cannot satisfy the LCO for coolant circulation. As in TS 3.4.9.2, the Actions require establishing an alternate method for the function(s) of the RHR shutdown cooling mode loop(s) required by the LCO within one hour. Because of the time that elapses prior to entering Operational Condition 5, there is less decay heat being generated in the core and therefore, there is less urgency needed in restoring the RHR shutdown cooling loop. In this condition, as above, the alternate method(s) completely replaces the function(s) of the RHR shutdown cooling mode loop(s) required by the LCO and therefore, provides for safe continued operation. Detensioning the reactor pressure vessel head has no effect on decay heat generation or removal capability.

TS 3.9.11.1 requires at least one RHR shutdown cooling mode loop to be operable and in operation in Operational Condition 5 with reactor cavity water level greater than or equal to 23 feet above the top of the reactor pressure vessel flange. If no RHR shutdown cooling mode loop is operable or in operation, the actions require (as above) establishing an alternate method to perform the functions of the RHR shutdown cooling mode loop required by the LCO within one hour. As stated in the bases for this technical specification, relaxation from the single failure criterion while in this condition is permissible because of the reduced decay heat generated by the core and the large heat sink available in the volume of water above the reactor pressure vessel flange. Therefore, in the event of a failure of the operating RHR loop, adequate time is provided to initiate alternate methods capable of decay heat removal or emergency procedures to cool the core.

Like TS 3.4.9.2 and 3.9.11.2, TS 3.9.11.1 does not currently contain an exception to the provisions of TS 3.0.4. As a result, this technical specification prohibits increasing reactor cavity water level above 23 feet above the top of the reactor pressure vessel flange without an operable RHR shutdown cooling mode loop in operation. Realistically, flooding the reactor cavity provides a "safer" configuration by providing a larger heat sink for core cooling. As in the cases discussed above, reactor core decay heat generation is further reduced and the alternate method(s) provides a complete replacement of the functions of the RHR shutdown cooling mode loop required by the LCO. Additionally, decay heat removal capability is increased when reactor cavity water level is increased. Hence, a change in plant conditions to Operational Condition 5 with the reactor cavity water level greater than or equal to 23 feet above the top of the reactor pressure vessel flange should be allowed while complying with the action requirements of TS 3.9.11.1.

Following refueling operations, the reactor cavity must be drained to reinstall the reactor vessel head. Hence, the reactor must change applicable conditions from those specified for TS 3.9.11.1 to those specified for TS 3.9.11.2. In this configuration, two ECCS would have to be operable per TS 3.5.2. Additionally, there would be even less decay heat being generated in the reactor vessel since approximately one third of the irradiated fuel has been replaced with fresh fuel. Since, upon entering the applicability for TS 3.9.11.2 both loops of RHR shutdown cooling are required to be operable, an exception to the provisions of TS 3.0.4 could be required even if TS 3.9.11.1 is satisfied. Based on the above considerations that less decay heat is being generated in this condition and the fact that the specific function(s) of the RHR shutdown cooling mode loop(s) required by the LCO is being completely replaced by the alternate method(s), a change in specified conditions to reactor cavity water level less than 23 feet above the top of the reactor pressure vessel flange should be allowed while complying with the action requirements of TS 3.9.11.2.

When the reactor head is fully tensioned, the reactor is back in Operational Condition 4, as defined by the technical specifications, and one of the fission product boundaries has been reestablished. Tensioning the reactor pressure vessel head has no effect on decay heat generation or removal capability. Because of the reduced decay heat being generated and the fact that the specific function(s) of the RHR shutdown cooling mode loop(s) required by the LCO is being completely replaced by the alternate method(s), a change in plant conditions to Operational Condition 4 should be allowed while complying with the action requirements of TS 3.4.9.2.

In conclusion, it has been shown that for each of the plant condition changes, the single failure criteria is maintained as required by each LCO and the function(s) that the RHR shutdown cooling mode loop(s) is required to perform by the LCO has been completely replaced by an alternate method(s). Additionally, the possible changes in operational conditions have no effect on decay heat generation or removal capability. Therefore, preplanned use of the operational flexibility allowed by the proposed change to TS 3.0.4 will continue to provide an equivalent level of safety during any mode changes into Operational Condition 4 or 5 by tensioning or detensioning the reactor vessel head or drain the reactor cavity water level to less than 23 feet above the reactor vessel flange while relying on the Action Statements of TS 3.4.9.2 and 3.9.11.2.