

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 320 ST. FRANCISVILLE, LOUISIANA 70775
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April 16, 1991
RBC- 34,834
File Nos. G9.5, G9.42

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

Gentlemen:

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

Gulf States Utilities Company (GSU) hereby files an application to amend the River Bend Station - Unit 1 Technical Specifications, Appendix A to Facility Operating License NPF-47, pursuant to 10CFR50.90. This application is filed to change Technical Specification Surveillance Requirement 4.3.8.2.a, "Turbine Overspeed Protection System," to allow monthly testing of the high pressure turbine control valves instead of weekly. The Attachment to this letter and the Enclosure provide the justifications and proposed revisions to the Technical Specifications, respectively.

Should you have any questions, please contact Mr. L. L. Dietrich of my staff at (504)381-4866.

Sincerely,

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

LAE/LLD/MSF

Attachment

cc: U.S. Nuclear Regulatory Commission
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NRC Resident Inspector
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Claudia Abbate
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Mr. Glenn Miller
Radiation Protection Division
Louisiana Department of Environmental Quality
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Docket No. 50-458

Ava C. Roach 4/16/91
Ava C. Roach
Notary Public in and for
East Feliciana Parish, Louisiana
authorized to act in West Feliciana
Parish, Louisiana

ATTACHMENT

PROPOSED
GULF STATES UTILITIES COMPANY
RIVER BEND STATION
DOCKET 50-458/LICENSE NO. NPF-47

TURBINE OVERSPEED PROTECTION SYSTEM
(91-01)

LICENSING DOCUMENT INVOLVED:

TECHNICAL SPECIFICATIONS

ITEM:

4.3.8.2.a.3

REASON FOR REQUEST:

In accordance with 10CFR50.90, Gulf States Utilities Company is requesting a change to River Bend Station Technical Specification (TS) 4.3.8.2.a.3 to incorporate vendor recommendations to decrease the surveillance frequency for the testing of the four high pressure turbine control valves from weekly to monthly. General Electric (GE) Technical Information Letter (TIL) No. 969, dated May 22, 1984, and Service Information Letter (SIL) No. 413, dated October 4, 1984, both recommend the reduced testing frequency. The current surveillance requirement has previously incorporated GE's recommendation of reduced testing frequencies for three out of four sets of turbine valves: the main stop valves, the intermediate stop valves and the intercept valves.

The operating experience accumulated on in-service nuclear units during the 24+ years prior to 1984, has shown considerably lower valve failure rates than those values upon which the original GE recommendations were based. These reduced failure rates are due to many design improvements to the nuclear turbine valves and controls that have been incorporated into the GE large steam turbine through GE's TILs and Engineering Change Notices (ECNs).

In General Electric's "Memo Report - Hypothetical Turbine Missiles - Probability of Occurrence," dated March 14, 1973, the probability of runaway failure and wheel burst of a GE nuclear turbine was given, based on the nuclear experience up to that time. Included in the probability calculations were the recommended valve test intervals (i.e., daily for main stop and intermediate stop and intercept valves, weekly for control valves). The Nuclear Wheel Information Letter No. 2, dated November 8, 1982, gave comparative values for the increased overspeed probabilities due to increasing test intervals.

Based on past in-service experience with nuclear turbine steam valves, turbine steam inlet valve reliability and testing intervals are no longer the major contributing factors in determining hypothetical turbine missiles. The overall probability of a

hypothetical missile is therefore increased only a negligible amount by increasing the test interval of the valves. Increasing test intervals will correspondingly decrease the probability of a system upset during such testing and should therefore increase the nuclear plant availability.

This change, if incorporated, would 1) greatly decrease unnecessary mechanical wear to the valves, 2) decrease the number of times that the turbine steam load is not equally distributed, 3) increase capacity factor by not having to reduce reactor power to $\leq 80\%$ to perform this surveillance requirement weekly, and 4) increase capacity factor due to the time it takes to reach 100% Rated Thermal Power after a xenon transient that is inherent with any power reduction and subsequent ascension.

This reduced surveillance frequency does not effect the Reactor Protection System testing function.

Figure 1 provides a simplified drawing to show that the main steam flows from the four main steam lines into an equalizing header (to equalize main steam line flow), through the four Turbine Stop Valves (TSV), through the four Turbine Control Valves (TCV) and enters the center of the high pressure turbine casing. Each TCV regulates the steam flow to one of the four nozzle boxes, two in the upper half shell and two in the lower half shell. The uniform flow distribution and the relatively thin walls of the nozzle boxes produce uniform heating of the shells to reduce distribution and minimize turbine shaft vibration.

The primary function of the control valves is to regulate reactor pressure and stop the steam flow to the high pressure turbine on a generator trip. They are located immediately downstream of the turbine stop valves.

The control valves (Figure 2) are balanced piston valves, reducing the forces required to lift the valve disc. Each control valve is operated by a single acting spring-to-close servomotor. It is opened by a servo-valve that receives its signal from the Electro-Hydraulic Control (EHC) System. This servomotor and servo-valve control arrangement comprises the power actuator of each valve.

DESCRIPTION:

The turbine overspeed protection system Technical Specification 3/4.3.8 is provided to ensure that the turbine overspeed protection system instrumentation and the turbine speed control valves are operable and will protect the turbine from excessive overspeed. This is required since excessive overspeed of the turbine could generate potentially damaging missiles.

The surveillance requirements and frequencies reflect GE's recommendations which are based upon accumulated operating

experience and are included in the Technical Specifications to demonstrate that the turbine overspeed protection system is operable.

General Electric has presented to the NRC their methodology for examining turbine rotors with respect to calculating the probability of a failure which would generate missiles from the turbine. The NRC has approved this General Electric methodology (reference letter to GSU/Deddens from NRC/Paulson dated August 26, 1987). General Electric has employed these NRC approved methods to examine the River Bend Station turbine rotors and has determined the probability of turbine missile generator due to rotor failure.

As discussed in Section 3.5 of the RBS USAR, the overall probability of unacceptable damage occurring from turbine generated missiles to critical plant regions is 5.0 E-9 . Since NUREG-0800, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, and RG-1.115, Protection Against Low Trajectory Turbine Missiles, specify 1.0 E-7 as the maximum acceptable probability for turbine missile generated damage to safety related equipment, it is clear River Bend exceeds this criteria up to and beyond 6 years of turbine service. USAR Section 10.2 indicates the minimum LP rotor inspection interval at River Bend is 6 years. When the rotor is inspected at or before the 6 year scheduled inspection, a new missile generation probability report will be issued by General Electric and subsequent inspection intervals will be adjusted if indicated by the report. GSU has committed to follow GE's turbine system maintenance program which has been approved by the NRC, as outline in Supplement 5 of the River Bend Safety Evaluation Report.

GE has determined that, effective with TIL 969, the recommended valve test intervals for nuclear turbine control valves should be monthly.

NO SIGNIFICANT HAZARDS CONSIDERATION:

As discussed in 10CFR50.92, the following discussions are provided to the NRC Staff in support of "no significant hazards considerations":

1. No significant increase in the probability or the consequences of an accident previously evaluated results from this change because:

The General Electric (GE) probabilistic analysis for the River Bend Station turbine has demonstrated that the probability of turbine failures are well within acceptable limits. This analysis has been previously reviewed and results approved by the NRC (reference letter to GSU/Deddens from NRC/Paulson, dated August 26, 1987).

2. This change would not create the possibility of a new or different kind of accident from any accident previously evaluated because:

The change in surveillance frequencies does not create the possibility of a new or different kind of accident. Additionally, the turbine control valve surveillance frequency has negligible affect the GE missile probabilistic results.

3. This change would not involve a significant reduction in the margin of safety because:

The GE probabilistic analysis demonstrates that the probability of unacceptable damage to plant safety-related equipment due to potential turbine missile generation is considerably within the limits specified in NUREG-0800, section 2.2.3, and RG 1.115.

The proposed amendment will not increase the possibility or the consequences of a previously evaluated event and will not create a new or different kind of accident from any previously evaluated. Also, the results of this proposed change are clearly within all acceptable criteria with respect to system components and design requirements. The ability to perform as described in the USAR is maintained and therefore, the proposed change does not involve a significant reduction in the margin of safety or significant hazards.

REVISED TECHNICAL SPECIFICATION:

The requested revision is provided in the Enclosure.

SCHEDULE FOR ATTAINING COMPLIANCE:

GSU is currently in compliance with the applicable Technical Specification requirements.

NOTIFICATION OF STATE PERSONNEL:

A copy of this amendment request has been provided to the State of Louisiana, Department of Environmental Quality - Radiation Protection Division.

ENVIRONMENTAL IMPACT APPRAISAL:

GSU has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, GSU concludes that the proposed change meets the

criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

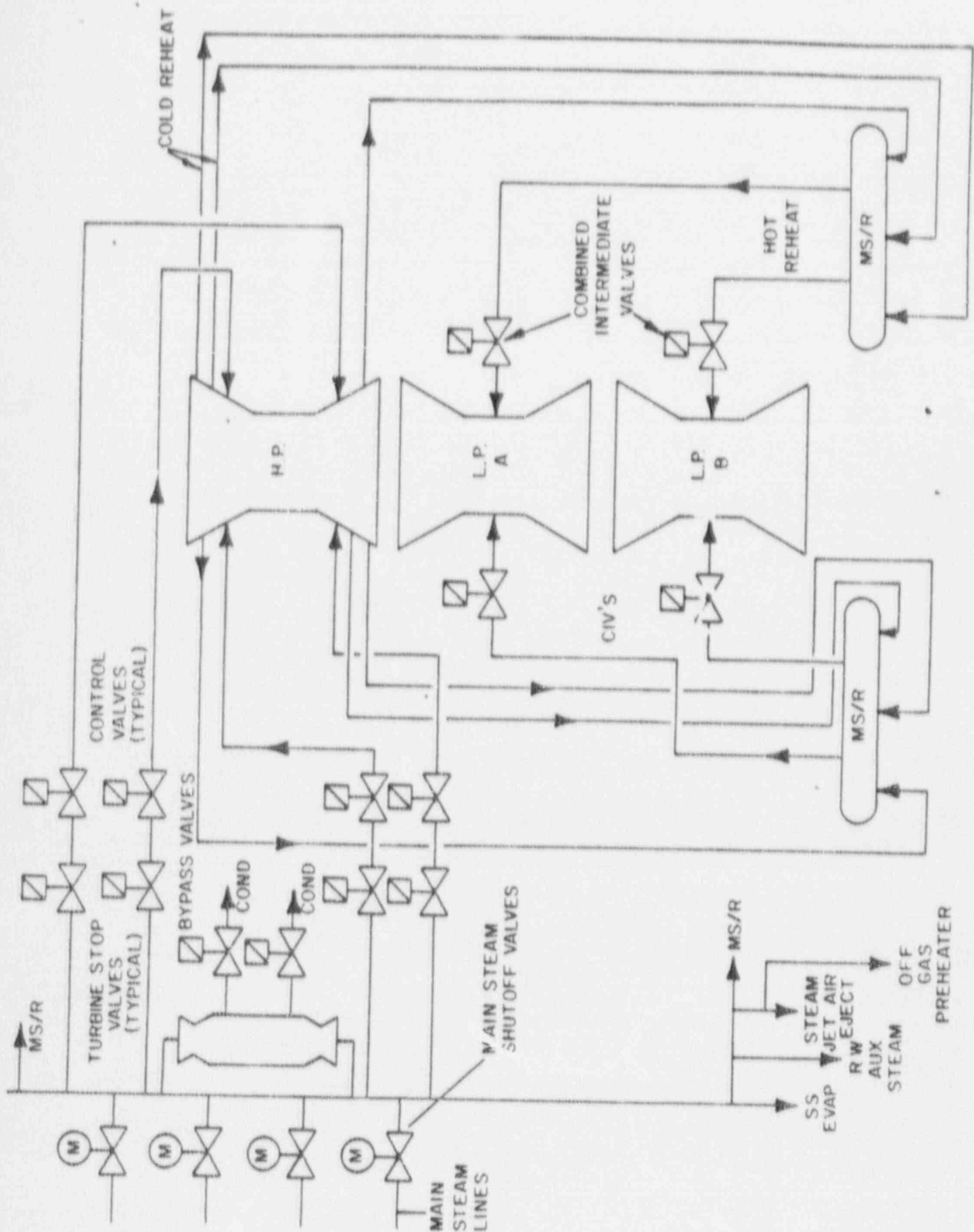
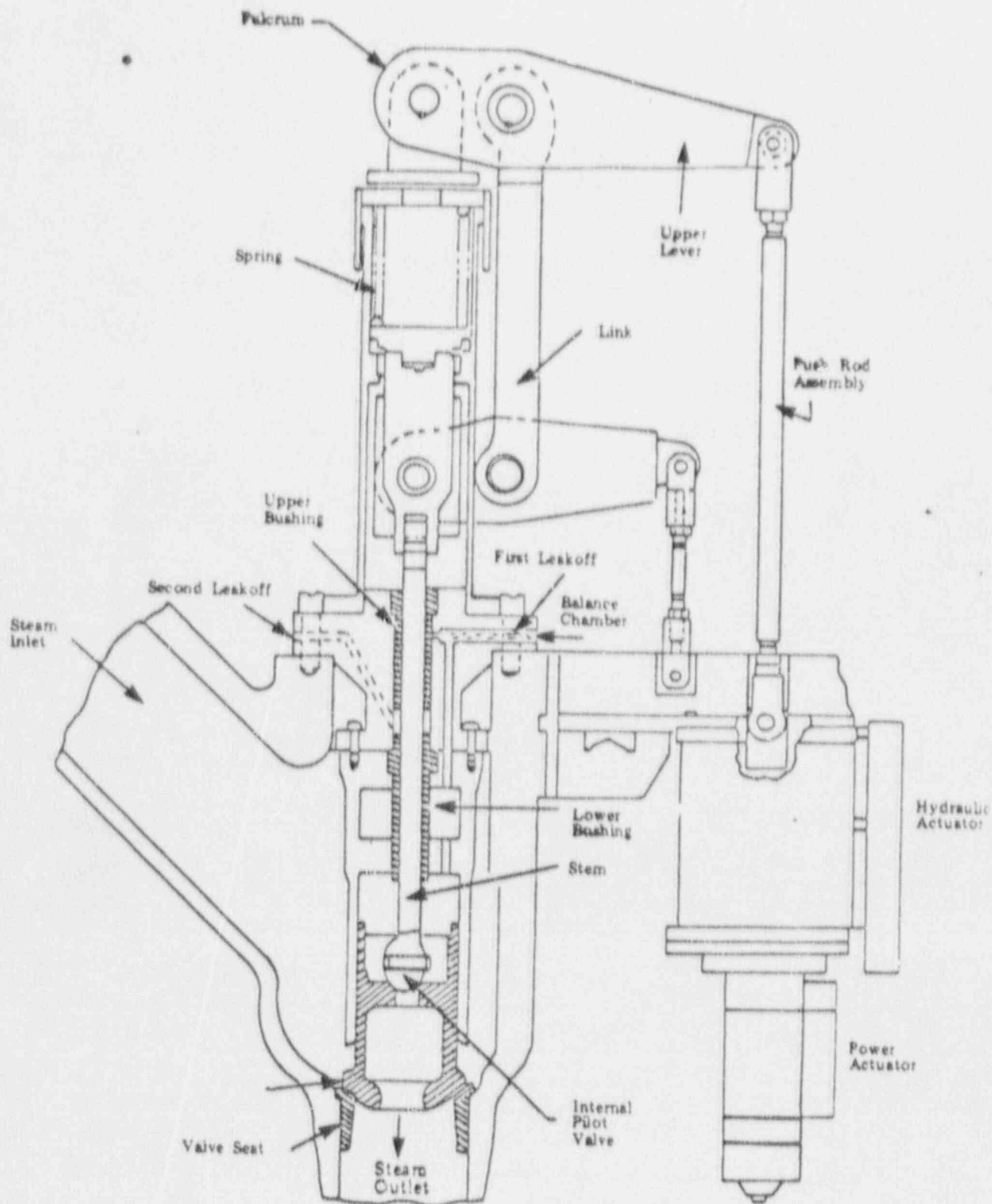


FIGURE 1

MAIN STEAM FLOW
FIG 1



CONTROL VALVES

FIG. 2