

Docket No. 50-458

August 20, 1991

DISTRIBUTION:

Gulf States Utilities  
ATTN: Mr. James C. Deddens  
Senior Vice President (RBNG)  
Post Office Box 220  
St. Francisville, Louisiana 70775

Docket File  
NRC PDR  
Local PDR  
PDIV-2 Reading  
BBoger  
MVirgilio  
EPeyton  
DPickett  
OGC  
DSkay  
DHagan  
GHill (4)  
Wanda Jones  
GDick  
PDIV-2 Plant File  
ACRS (10)  
GPA/PA  
ARM/LFMB  
PHarrell, Region IV  
CMcCracken

Dear Mr. Deddens:

SUBJECT: RIVER BEND STATION, UNIT 1 - AMENDMENT NO. 59 TO FACILITY  
OPERATING LICENSE NO. NPF-47 (TAC NO. 80206)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 59 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated April 16, 1991.

The amendment revises Technical Specification Surveillance Requirement 4.3.8.2.a, "Turbine Overspeed Protection System" by reducing the testing frequency of the high pressure turbine control valves from once every 7 days to once every 31 days. The change in the testing interval is recommended by the turbine vendor based on accumulated operating experience and a change in the basis for calculating missile probability.

A copy of our Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original Signed By

Douglas V. Pickett, Project Manager  
Project Directorate IV-2  
Division of Reactor Projects - III/IV/V  
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 59 to NPF-47
- 2. Safety Evaluation

cc w/enclosures:  
See next page

OFC	: PDIV-2/LA	: PDIV-2/PE	: PDIV/PM	: NRR: SPLB	: OGC	: PDIV-2/(A)D
NAME	: EPeyton	: DSkay	: DPickett:ye	: CMcCracken	: GDick	
DATE	: 7/31/91	: 8/1/91	: 7/31/91	: 8/1/91	: 8/6/91	: 8/20/91

OFFICIAL RECORD COPY  
Document Name: RIVER BEND/TAC NO 80206

**NRC FILE CENTER COPY**

9109050073 910820  
PDR ADOCK 0500045B  
P PDR

*DF-01*  
*111*  
*CP1*

Mr. James C. Deddens

- 2 -

August 20, 1991

cc w/enclosures:

Winston & Strawn

ATTN: Mark J. Wetterhahn, Esq.

1400 L Street, N.W.

Washington, D.C. 20005-3502

Ms. H. Anne Plettinger

3456 Villa Rose Drive

Baton Rouge, Louisiana 70806

Mr. Les England

Director - Nuclear Licensing

Gulf States Utilities Company

P. O. Box 220

St. Francisville, Louisiana 70775

Mr. Philip G. Harris

Cajun Electric Power Coop. Inc.

10719 Airline Highway

P. O. Box 15540

Baton Rouge, Louisiana 70895

Senior Resident Inspector

P. O. Box 1051

St. Francisville, Louisiana 70775

President of West Feliciana

Police Jury

P. O. Box 1921

St. Francisville, Louisiana 70775

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

Mr. J. E. Booker

Manager-Nuclear Industry Relations

Gulf States Utilities

P. O. Box 2951

Beaumont, Texas 77704

Mr. Glenn Miller, Administrator

Radiation Protection Division

P. O. Box 82135

Baton Rouge, Louisiana 70884-2135

Mr. J. David McNeill, III

William G. Davis, Esq.

Department of Justice

Attorney General's Office

P. O. Box 94095

Baton Rouge, Louisiana 70804-9095



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

GULF STATES UTILITIES COMPANY

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59  
License No. NPF-47

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Gulf States Utilities Company (the licensee) dated April 16, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility Operating License No. NPF-47 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 59 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. GSU shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



George F. Dick, Jr., Acting Director  
Project Directorate IV-2  
Division of Reactor Projects - III/IV/V  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: August 20, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 59

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

Replace the following page of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. The overleaf page is provided to maintain document completeness.

REMOVE

3/4 3-106

INSERT

3/4 3-106

TABLE 4.3.7.11-1 (Continued)

TABLE NOTATIONS

- \* At all times.
- \*\* During main condenser offgas treatment system operation.
- (1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:
  - a. Instrument indicates measured levels above the alarm setpoint.
  - b. Circuit failure.
  - c. Instrument indicates a downscale failure.
  - d. Instrument controls not set in operate mode.
- (2) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards (NBS) or using standards that have been obtained from suppliers that participate with NBS in measurement assurance activities. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used.
- (3) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:
  - a. One volume percent hydrogen, balance nitrogen, and
  - b. Four volume percent hydrogen, balance nitrogen.
- (4) The surveillance requirements apply to all ranges of the monitoring equipment.

## INSTRUMENTATION

### 3/4.3.8 TURBINE OVERSPEED PROTECTION SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.3.8 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

- a. With one turbine control valve or one turbine stop valve per high pressure turbine steam lead inoperable and/or with one turbine intercept valve or one turbine intermediate stop valve per low pressure turbine steam lead inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours or close at least one valve in the affected steam lead or isolate the turbine from the steam supply within the next 6 hours.
- b. With the above required turbine overspeed protection system otherwise inoperable, within 6 hours isolate the turbine from the steam supply.
- c. The provisions of Specification 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.3.8.1 The provisions of Specification 4.0.4 are not applicable.

4.3.8.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

- a. At least once per 7 days by cycling each of the following valves through at least one complete cycle from the running position:
  - 1) Four high pressure turbine stop valves,
  - 2) Four low pressure turbine intermediate stop valves, and
  - 3) Four low pressure turbine intercept valves.
- b. At least once per 31 days by cycling the four high pressure turbine control valves through at least one complete cycle from the running position.
- c. At least once per 18 months by performance of a CHANNEL CALIBRATION of the turbine overspeed protection system.
- d. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of all valve seats, disks and stems and verifying no unacceptable flaws or excessive corrosion. If unacceptable flaws or excessive corrosion are found, all other valves of that type shall be inspected.

## INSTRUMENTATION

### 3/4.3.8 TURBINE OVERSPEED PROTECTION SYSTEM

#### LIMITING CONDITION FOR OPERATION

---

3.3.8 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

- a. With one turbine control valve or one turbine stop valve per high pressure turbine steam lead inoperable and/or with one turbine intercept valve or one turbine intermediate stop valve per low pressure turbine steam lead inoperable, restore the inoperable valve(s) to OPERABLE status within 72 hours or close at least one valve in the affected steam lead or isolate the turbine from the steam supply within the next 6 hours.
- b. With the above required turbine overspeed protection system otherwise inoperable, within 6 hours isolate the turbine from the steam supply.
- c. The provisions of Specification 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.3.8.1 The provisions of Specification 4.0.4 are not applicable.

4.3.8.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

- a. At least once per 7 days by cycling each of the following valves through at least one complete cycle from the running position:
  - 1) Four high pressure turbine stop valves,
  - 2) Four low pressure turbine intermediate stop valves, and
  - 3) Four low pressure turbine intercept valves.
- b. At least once per 31 days by cycling the four high pressure turbine control valves through at least one complete cycle from the running position.
- c. At least once per 18 months by performance of a CHANNEL CALIBRATION of the turbine overspeed protection system.
- d. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of all valve seats, disks and stems and verifying no unacceptable flaws or excessive corrosion. If unacceptable flaws or excessive corrosion are found, all other valves of that type shall be inspected.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 59 TO FACILITY OPERATING LICENSE NO. NPF-47

GULF STATES UTILITIES COMPANY

RIVER BEND STATION, UNIT 1

DOCKET NO. 50-458

1.0 INTRODUCTION

By letter dated April 16, 1991, Gulf States Utilities Company (GSU) (the licensee) requested an amendment to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The proposed amendment would modify Technical Specification (TS) Surveillance Requirement 4.3.8.2.a "Turbine Overspeed Protection System" by reducing the testing frequency of the high pressure turbine control valves from once every 7 days to once every 31 days.

The turbine overspeed protection system protects the turbine from excessive overspeed by closing the turbine steam admission valves when a high turbine speed is sensed. Although steam turbines and their auxiliaries are not safety-related systems as defined by NRC regulations, excessive overspeed of the turbine can produce large, high-energy missiles. If such a missile were to strike and damage plant safety-related structures, systems, or components, they could render them unavailable to perform their safety function.

The current surveillance frequency is based on the original General Electric (GE) recommendations of March 1973, which were based on the probability of overspeed and wheel burst of a turbine. Operating experience accumulated 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. GE documented these findings in Service Information Letter (SIL) No. 413 dated October 4, 1984, which recommended monthly testing of high pressure turbine control valves. This has been reviewed and approved for inclusion in the Technical Specifications of all recently licensed BWRs and GSU has already incorporated recommendations for reduced testing frequencies for the other three sets of turbine valves.

## 2.0 EVALUATION

The current Technical Specification requires that the four high pressure turbine control valves be cycled through at least one complete cycle from the running position at least once per 7 days. Reactor power must be reduced to  $\leq 80\%$  in order to perform this surveillance requirement. The change to a 31-day testing interval would reduce the number of reactor power reductions necessary to accommodate turbine control valve testing. Fewer deviations from steady state design conditions would reduce the probability of a reactor/turbine trip and the attendant challenge to safety systems.

The testing frequency for turbine control valves is based on the theoretical probability of a missile being generated in the turbine due to overspeed. General Electric presented to the NRC their methodology for calculating the probability of failure in their report "Probability of Missile Generation in General Electric Nuclear Turbines" (Ref. 1). GE determined that, based on past in-service experience with nuclear turbine steam valves, turbine steam inlet valve reliability is no longer the major contributing factor in determining hypothetical missile generation. Instead, the dominant failure mode is considered to result from propagation of turbine rotor cracks, and failure is most likely to occur at normal running speed - not an overspeed condition potentially attributable to control valve malfunctions. The methodology was reviewed and found acceptable by the NRC for use in establishing inspection and testing intervals for turbine systems.

In a study of the River Bend turbine system, GE calculated a probability of  $5 \times 10^{-6}$  (Ref. 2) for a missile being generated in the turbine based on a six year rotor inspection interval and weekly testing of the turbine control valves. This is well within the limit of  $1 \times 10^{-4}$  recommended by Regulatory Guide (RG) 1.115. The probability of damage to safety-related systems, calculated as  $5 \times 10^{-9}$  (Ref. 3), is also within the limit of  $1 \times 10^{-7}$  specified in RG 1.115 and the Standard Review Plan (SRP) Section 3.5.1.3. GE Technical Information Letter (TIL) No. 969 documents GE's findings that the probability of missile generation increases only a negligible amount by increasing valve testing intervals from weekly to monthly. This assures that the probability of failure will still be within the limits identified above when the revised surveillance frequency is used.

Based on the staff's review of the licensee's submittal, RG 1.115, SRP Section 3.5.1.3, GE SIL 413, and GE TIL 969, the change to a 31-day testing interval for the turbine control valves is acceptable.

## 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Louisiana State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (56 FR 24212). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

#### REFERENCES

1. Hope Creek Safety Evaluation Report, Supplement 6, Appendix U, dated July 1986.
2. Letter from J. E. Booker of GSU to NRC, dated May 13, 1987.  
Approved by letter from W. Paulson of NRC to GSU dated August 26, 1987.
3. River Bend Updated Safety Analysis Report, Section 3.5.1.3.4.1.

Principal Contributor: Donna Skay

Date: August 20, 1991