



GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 226 ST. FRANCISVILLE, LOUISIANA 70775

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December 27, 1990
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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 enclosed Licensee Event Report No. 90-005, Revision 02 for River Bend Station - Unit 1. This supplemental report is being submitted pursuant to 10CFR50.73 to describe additional corrective action taken relative to offgas pretreatment setpoint calculations.

Sincerely,

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

AS JS DM WM
LAE/PDG/DEJ/DNL/JMM/JLB/pg

cc: U.S. Nuclear Regulatory Commission
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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) RIVER BEND STATION		DOCKET NUMBER (2) 050004581	PAGE (3) 1 OF 05
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TITLE (4)
Conditions Affecting the Offgas Pretreatment Radiation Monitor

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
03	02	90	09	005	02	12	27	90		050000
										050000

OPERATING MODE (9): 1

POWER LEVEL (10): 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)

20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(ii)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.406(a)(1)(iii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	50.73(a)(2)(ii)	50.73(c)(2)(viii)(A)	
20.406(a)(1)(iv)	X 50.73(a)(2)(a)	50.73(a)(2)(viii)(B)	
20.406(a)(1)(v)	X 50.73(b)(2)(iii)	50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: L. A. England, Director-Nuclear Licensing

TELEPHONE NUMBER: 504 381-4145

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS
B	I	L	R	A					
			5	4	2	C	N		

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15): 03 31 91

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On 03/02/90 and on 03/06/90 with the reactor operating at 100 percent power (Operational Condition 1), conditions affecting the offgas pretreatment radiation monitor (PTRM) were identified by Engineering personnel. These conditions were (1) a non-conservative value for the high alarm setpoint, and (2) periods of inoperability in the past in which the monitor has been inoperable due to inadequate sample flow. These are reportable as (1) a condition outside of the design basis, and (2) operation prohibited by the Technical Specifications, respectively.

The erroneous high alarm setpoint has been corrected. GSU has also identified short and long term corrective actions to assure adequate sample flow is maintained to the monitor and thus assure operability.

Subsequent operations have demonstrated that the corrected high alarm setpoint is overly conservative. Therefore, GSU plans to revise the setpoint upward based on a more realistic calculation.

Due to the presence of redundant, independent monitors and alarms, adequate assurance exists that RBS has not exceeded the revised alarm setpoint. For the same reason, alternative means of monitoring radioactivity is provided in the RBS design even with the PTRM inoperable. Therefore, these conditions have not adversely affected the health and safety of the public.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD
COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS
AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR
REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO
THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) RIVER BEND STATION	DOCKET NUMBER (2) 0 5 0 0 0 4 5 8 9 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			0 0 5	0 2	0 2	OF 0 5

TEXT (If more space is required, use additional NRC Form 366A's) (17)

REPORTED CONDITION

On 03/02/90 and on 03/06/90 with the reactor operating at 100 percent power (Operational Condition 1), conditions affecting the offgas pretreatment radiation monitor (*RA*) (PTRM) were identified by Engineering personnel.

The conditions identified on 03/02/90 were calculation errors which resulted in a non-conservative value for the offgas pretreatment high alarm setpoint, which was incorporated into Technical Specification 3.3.7.1. This was discovered in conjunction with a modification to relocate the detector portion of the monitor. GSU's review of the original setpoint calculation by Stone and Webster resulted in identification of the errors. This condition is outside the design basis of the plant and is reported pursuant to 10CFR50.73(a)(2)(ii)(B).

A condition identified on 03/06/90 by Engineering was that there have been several periods of time that the offgas system pretreatment radiation monitor has been inoperable due to inadequate sample flow through its sample chamber. This condition is considered reportable pursuant to 10CFR50.73(a)(2)(i)(B) as operation prohibited by the plant Technical Specifications.

INVESTIGATIONSetpoint

The investigation of the setpoint identified three offgas system PTRM (1D17-REN012) setpoints requiring revision. A comparison of each setpoint (old and new) and its function is provided below. All setpoint figures are in units of mR/hr.

<u>Setpoint Function</u>	<u>Original T/S Setpoint</u>	<u>Revised Setpoint as of 3/90</u>
Control Room Alarm and Tech.Spec. 3.3.7.1 LCO	2.48×10^4	546
Emergency Plan N.O.U.E. Emergency Action Level 3	4.08×10^4	943
Emergency Plan Alert Emergency Action Level 1	4.08×10^5	9,430

Stone and Webster Engineering Corporation (SWEC) reviewed the methodologies used in establishing the setpoint. This review identified two methodology errors which resulted in the non-conservative setpoint values, as follows:

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FACILITY NAME (1) RIVER BEND STATION	DOCKET NUMBER (2) 0 5 0 0 0 4 5 8 9 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
			0 0 5	0 2	0 3	OF 0 5

TEXT (If more space is required, use additional NRC Form 366A's) (17)

- 1) A conceptual error in the methodology used regarding the distribution of activity flow rates at piping branch points.

This led to calculation of setpoints that were independent of offgas system operating modes (i.e., startup operation versus normal operation).
- 2) The use of "stretch" reactor thermal power (105%) as the basis for the total steam-to-main condenser mass flow rate. The Technical Specifications for River Bend specify a total activity release rate limit which is based on 100% reactor thermal power. Thus, the basis for the old setpoint is inconsistent with the Technical Specification limit.

Sample Flow

An operator aid has been used since 1986 to determine sample flow with condensation present in the sample lines. Condensation causes upscale flow indication on the rotameter due to the presence of water droplets in the gas stream. This operator aid was intended to allow the operator to assure adequate sample flow by monitoring the pressure drop across the sample panel metering valve, 10FG-V74, and comparing the reading to that on a graph. To confirm that this differential pressure could be used to determine that adequate sample flow has existed, readings from recorder 1D17-R604 and STP-000-0001, "Daily Operating Logs", were compared with the readings obtained from the PTRM's installed radioactive source (with no sample flow). From this data it has been determined that there have been several periods of time during which sample flow was inadequate and thus the PTRM has been inoperable during these periods.

The root cause of condensation in the sample lines is twofold. First, the PTRM sample lines are located downstream of the offgas system water separator and upstream of the holdup pipe. Second, the heat tracing/insulation is not adequate to maintain the sample gas stream temperature greater than the process line temperature. Since the gas stream at this point in the system has a high moisture content, the sample lines must be kept at a higher temperature than the process line to avoid condensation in the sample lines. It has been determined that incorrect insulation is installed and that more heat trace wire will need to be installed to maintain the temperature of the sample lines greater than that of the process line. The heat tracing is designed to maintain the sample piping at 160°F. However, this temperature cannot be maintained with the system in its current configuration.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		0 0 0 5	0 2	0 4	OF	0 5	

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CORRECTIVE ACTION

Sample Flow Problem

As short-term corrective action, procedures have been implemented which require the PTRM sample lines to be drained during every shift. This assures that adequate sample flow is maintained with the current design.

Long-term corrective action will be to install additional heat tracing and the proper type of insulation. This should assure that moisture in the sample gas stream will not condense in the sample lines, thus allowing adequate sample flow without requiring the sample lines to be drained. Maintenance work order (MWO)-130379 was initiated on 02/14/90 to initiate these corrective actions.

Subsequent Setpoint Analysis

The alarm setpoint was reduced from 2.48×10^4 mR/hr to 546 mR/hr. Subsequent operation, particularly during the monitoring of leaking fuel assemblies, demonstrated that the new alarm setpoint was overly conservative. Therefore, the Technical Specification (T/S), Emergency Implementing Procedures and USAR changes pending as a result of the new setpoint were deferred until the calculation could be further analyzed.

A detailed review of the assumptions in the new calculation indicated that the setpoint had been calculated for full power operation to maximize steam flow and non-condensable flow to the condenser. In addition, offgas flow had been assumed to be equal to system start-up flow, to maximize radionuclide flow to the pretreatment monitor. These two assumptions were incompatible.

For full power operations, reactor main steam flow is 12,474,347 lbs/hr and offgas flow is about 50 scfm. General Operating Procedure (GOP)-0001 limits operation of the mechanical vacuum pumps from the condenser to less than 5% power. Above this power, the off gas system must be in operation. So, for offgas start-up, the main steam flow to the condenser is 5% of full power steam flow, or 623,717 lbs/hr. Offgas start-up flow is about 250 scfm. Therefore, operation of the offgas system occurs in essentially two conditions:

	<u>Start-up</u>	<u>Full Power</u>
Steam Flow	623,717	12,474, 47 lbs/hr
Offgas Flow	250	30 scfm

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		0	0	5	0	5 OF 0 5

TEXT (If more space is required, use additional NRC Form 386A's) (17)
To realistically determine the pretreatment setpoint, calculations have been performed at each operating condition. These calculations will be validated against plant operating data. The results of this validation will be included in a revision to this report, to be submitted by March 31, 1991.

SAFETY ASSESSMENT

The offgas pre-treatment radiation monitoring system is designed to give indication of fuel failure by monitoring radioactivity in the condenser offgas stream before it enters the delay pipe and after it has passed through the offgas condenser and water separator. The main steam and offgas streams are monitored in several locations in addition to the offgas pre-treatment monitor. Radiation levels in excess of 3 times normal background in the main steam tunnel result in a reactor scram and closure of the main steam isolation valves via the main steam line radiation monitors. In addition, extreme high levels of radioactivity in offgas downstream of the charcoal adsorber trains result in the isolation of the offgas discharge line. Gaseous plant effluent, including offgas, is monitored by the main plant exhaust radiation monitors. These provide alarm functions to help limit radioactive releases to the environment. Thus alternate means of detecting fuel failures is provided in the RBS design even with the PTRM inoperable due to the sample flow problem. Leaks from the offgas system upstream of the post-treatment monitor can be detected via the radiation monitor in the offgas building ventilation system. This detector is upstream of the main plant exhaust monitors where it limits the potential for unmonitored releases from the offgas building.

Redundant and independent radiation monitors in main steam, offgas, and plant ventilation and exhaust, ensure that releases of radioactivity from the offgas stream would be detected prior to exceeding 10CFR100 limits. Finally, corrective actions have been initiated to correct the setpoint and assure continued operability of the monitor. Therefore, the conditions described in this report have not adversely affected the health and safety of the public.

NOTE: Energy Industry Identification System Codes are identified in the text as (*XX*).