NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
RIVER BEND STATION	0 5 0 0 0 4 5 8	1 OF 0 4

TITLE (4)

Radiation Monitor Heat Exchangers Plugged with Corrosion Due to Service Water Chemistry

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)
1 0	1 9	8 7	8 7	— 0 2 3	— 0 1	0 1	2 9	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Voluntary
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
E.R. Grant - Director-Nuclear Licensing	5 0 4 3 8 1 - 4 1 4 5

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
E	H L	R M	G 0 6 3	N					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On 10/19/87 during shutdown (mode 5), the cooling water lines to heat exchanger 1RMS*HX11A serving one of the two redundant annulus exhaust radiation monitors (1RMS*RE11A) were found to be plugged due to a buildup of corrosion. This discovery was made during routine inspection of the heat exchangers. On 11/18/87, the cooling water lines to the heat exchanger in the redundant train were also found to be plugged due to corrosion buildup. The root cause that led to the plugging of these lines has been attributed to the past condition of service water chemistry.

Subsequent evaluation has concluded that the annulus exhaust radiation monitors will perform their required safety function of initiating the Standby Gas Treatment System in the event of a high radiation condition in the Reactor Building Annulus without cooling water being supplied to 1RMS*HX11A and 11B. Therefore, this condition no longer satisfies the reporting requirements of 10CFR50.73 and hence, this report is being provided for information only.

The corrective action which was taken to eliminate the possibility of corrosion in the service water supply and return lines to heat exchangers 1RMS*HX11A and 11B was to replace the carbon steel piping with stainless steel piping.

This condition did not result in any increase in risk to the public.

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

REPORTED CONDITION

On 10/19/87 during shutdown (mode 5) for River Bend Station's first refueling outage, the cooling water lines to heat exchanger (*HX*) 1RMS*HX11A serving one of the two redundant annulus exhaust radiation monitors (*RM*) (1RMS*RE11A) were found to be plugged due to a buildup of corrosion. This discovery was made during routine inspection of the heat exchangers. On 11/18/87, the cooling water lines to the heat exchanger in the redundant train were also found to be plugged due to corrosion buildup. The root cause that led to plugging of these lines has been attributed to the past condition of Standby Service Water System (*BI*) chemistry. Subsequent evaluation has concluded that the annulus exhaust radiation monitors will perform their required safety function without cooling water being supplied to 1RMS*HX11A and 11B. Therefore, this condition no longer satisfies the reporting requirements of 10CFR50.73 and hence, this report is being provided for information only.

INVESTIGATION

Radiation monitors 1RMS*RE11A and 11B are provided to detect airborne radiation in the Reactor Building Annulus (*NG*) ventilation exhaust. These safety related offline gas monitors are designed to perform their required safety function under normal, abnormal and postulated accident conditions and are provided with safety related Class 1E 120-V AC power. Upon sensing a high radiation condition, the Annulus Pressure Control system is isolated, the Annulus Mixing and Standby Gas Treatment Systems (SGTS) (*BH*) are activated, and the annulus exhaust is directed through the SGTS.

Technical Specification 3/4.3.2, "Isolation Actuation Instrumentation," requires both channels of the annulus exhaust radiation monitoring system be operable in operating modes 1, 2 or 3. With one train inoperable, the Technical Specification requires that within one hour, the Annulus Mixing System be initiated and the annulus exhaust be lined up to at least one operating SGTS train. Since this condition was discovered with the unit in mode 5, there are no Technical Specification actions that are applicable.

Water from the Standby Service Water system is supplied to these heat exchangers to provide cooling of the gas sample prior to entering the radiation monitor. The design basis of this system requires a cooling water flow of 5-9 gpm to reduce the sample temperature from the conservatively predicted post-accident annulus atmosphere temperature of 165 degrees F to a temperature less than the sample pump trip setpoint of 115 degrees F. The post accident annulus temperature of 165 degrees F was obtained by conservatively assuming equilibrium with the containment following a large high energy line break in the drywell. If the sample temperature exceeds the setpoint temperature, the sample pump (*P*) isolates rendering the radiation monitor inoperable.

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A deterministic evaluation of the operation of the annulus exhaust radiation monitors during post-LOCA conditions has been performed. This evaluation conservatively assumed that the sample gas at the inlet to the sample piping was at the design basis containment temperature for a large break LOCA. In addition, the cooling water flow to these heat exchangers was assumed to be zero. The results of this evaluation showed that the sample gas temperature would be reduced below the sample pump trip setpoint temperature of 115 degrees F while traveling through the sample piping in route to the sample panel. Therefore, the annulus exhaust radiation monitors would still have performed their required safety functions even without any cooling water flow to the sample gas heat exchangers. Therefore, this condition no longer meets the reporting requirements of 10CFR50.73, and hence, this report is being provided for information only.

The primary cause of the buildup of corrosion in these supply and return lines has been attributed to previous service water system chemistry. The primary contributors to mild steel corrosion and the buildup of corrosion products found in the service water system are: 1) initial fill of the service water system with shallow well water which has been shown to be very agressive in promoting corrosion due to its low pH (pH = 5.7), 2) introduction of acid feed for flume pH control close to the service water system suction which resulted in lower pH and aggressive conditions in the service water system in comparison to the bulk Circulating Water/Flume volume, 3) periodic flume pH excursions resulting from inadequate pH control (pH as low as 3.5 on occasion), 4) the lack of a carbon steel corrosion inhibitor in the water treatment program, and 5) poor clarifier performance resulting in carryover of suspended solids and pinflock.

The only other components supplied by the Standby Service Water system which are similar in size and configuration to the subject heat exchangers are 1RMS*HX15A and 15B. These heat exchangers provide cooling of the sample fluid for radiation monitors 1RMS*RE15A and 15B, respectively. These monitors do not perform any active safety function and only provide operator information concerning potential RHR heat exchanger tube leakage. In addition, these radiation monitors are not required to be operable per the River Bend Station Technical Specifications. The service water supply and return lines for these heat exchangers were found to be in a similar condition as the lines to/from heat exchangers 1RMS*HX11A and 11B. These lines have been chemically cleaned to ensure that adequate flow is available.

There have been no LERs previously submitted by River Bend Station as a result of the condition of past service water chemistry.

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

CORRECTIVE ACTION

The corrective action taken to eliminate the possibility of corrosion in the service water supply and return lines to heat exchangers 1RMS*HX11A and 11B was to replace the carbon steel piping with stainless steel. Since the monitors have been shown to be operable without any cooling water flow, no additional corrective action is necessary.

To address the impact on other safety-related components (other heat exchangers in particular), and corrective actions to preclude future problems from developing in safety-related components associated with the Service Water System, a program to improve the overall quality and control of the service water system chemistry is under development.

SAFETY ASSESSMENT

There was no safety consequence created by the discovered condition. These monitors would have performed their safety function even without cooling water to the sample gas heat exchangers. The Standby Gas Treatment system would have been automatically initiated by redundant and diverse safety related signals generated by a low reactor water level, high drywell pressure or high annulus radiation condition. Reliable automatic initiation of the Standby Gas Treatment system ensures that there would have been no reduction in the degree of protection provided to the public health and safety.

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

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 enclosed Licensee Event Report No. 87-023 Revision 1 for River Bend Station - Unit 1. This LER has subsequently been determined to be not reported pursuant to 10CFR50.73. Therefore, this report is being submitted for information only.

Sincerely,

J. E. Booker

J. E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEB/TFP/PDG/DAS/ch

cc: U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

NRC Resident Inspector
P.O. Box 1051
St. Francisville, LA 70775

INPO Records Center
1100 Circle 75 Parkway
Atlanta, GA 30339-3064

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