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**Rick J. King**  
Director  
Nuclear Safety Assurance

April 13, 2000

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Subject: River Bend Station - Unit 1  
Docket No. 50-458  
License No. NPF-47  
Licensee Event Report 50-458/00-004-00

File Nos. G9.5, G9.25.1.3

RBG-45316  
RBF1-00-0073

Ladies and Gentlemen:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report.  
There are no commitments in this document.

Sincerely,

A handwritten signature in black ink, appearing to read "RJK/KHJ".

RJK/KHJ  
enclosure

IE22

Licensee Event Report 50-458/00-004-00

April 13, 2000

RBG-45316

RBF1-00-0073

Page 2 of 2

cc: U. S. Nuclear Regulatory Commission  
Region IV  
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NRC Sr. Resident Inspector  
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**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)

River Bend Station

DOCKET NUMBER (2)

05000-458

PAGE (3)

1 of 4

TITLE (4)  
Automatic Standby Gas Treatment System Actuation Due to Annulus Exhaust Radiation Monitor Trip

| 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 NAME                 | DOCKET NUMBER |
| 12             | 27  | 1999 | 2000           | 04                | 00              | 04              | 13  | 2000 | FACILITY NAME                 | DOCKET NUMBER |

| OPERATING MODE (9) | POWER LEVEL (10) | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11) |                   |                   |   |
|--------------------|------------------|---|-------------------|-------------------|---|
| 1                  | 100%             | 20.2201(b)  | 20.2203(a)(2)(v)  | 50.73(a)(2)(i)    | 50.73(a)(2)(viii)                             |
|                    |                  | 20.2203(a)(1)   | 20.2203(a)(3)(i)  | 50.73(a)(2)(ii)   | 50.73(a)(2)(x)                                |
|                    |                  | 20.2203(a)(2)(i)  | 20.2203(a)(3)(ii) | 50.73(a)(2)(iii)  | 73.71   |
|                    |                  | 20.2203(a)(2)(ii)   | 20.2203(a)(4)     | X 50.73(a)(2)(iv) | OTHER   |
|                    |                  | 20.2203(a)(2)(iii)  | 50.36(c)(1)       | 50.73(a)(2)(v)    | Specify in Abstract below or in NRC Form 366A |
|                    |                  | 20.2203(a)(2)(iv)   | 50.36(c)(2)       | 50.73(a)(2)(vii)  |   |

LICENSEE CONTACT FOR THIS LER (12)

NAME  
D. N. Lorfing, Supervisor - Licensing

TELEPHONE NUMBER (Include Area Code)  
225-381-4157

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
|       |        |           |              |                    |       |        |           |              |                    |
|       |        |           |              |                    |       |        |           |              |                    |

SUPPLEMENTAL REPORT EXPECTED (14)

| YES<br>(If yes, complete EXPECTED SUBMISSION DATE). | NO | EXPECTED | MONTH | DAY | YEAR |
|---|----|----------|-------|-----|------|
|   | ✓  |          |       |     |      |

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On December 27, 1999, an unplanned automatic actuation of the standby gas treatment and annulus mixing systems occurred. The initiating signal originated in radiation monitor RMS-RE11B, which monitors the reactor building annulus for gaseous activity. The redundant RMS-RE11A radiation monitor and grab samples of the annulus atmosphere indicated normal radioactive levels. The filter cartridge in the RMS-RE11B radiation monitor was changed and its indication returned to normal. The standby gas treatment and annulus mixing systems were returned to their normal standby configuration. This LER is required in accordance with 10CFR50.73(a)(2)(iv) due to automatic actuation of an ESF system.

An investigation of the event determined that the filter cartridge in the RMS-RE11B radiation monitor was incorrectly installed, such that sample flow could bypass the filter. It is postulated that particulate matter bypassed the filter element and was detected by the radiation monitor. This event was not significant with respect to the health and safety of the public.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

| FACILITY NAME (1)  | DOCKET (2)<br>NUMBER (2) | LER NUMBER (6) |                      |                    | PAGE (3) |
|--------------------|--------------------------|----------------|----------------------|--------------------|----------|
|                    |                          | YEAR           | SEQUENTIAL<br>NUMBER | REVISION<br>NUMBER |          |
| River Bend Station | 05000-458                | 00             | -- 04 --             | 00                 | 2 OF 4   |
|                    |                          |                |                      |                    |          |

**REPORTED CONDITION**

At 1926 on December 27, 1999, with the plant in Mode 1 (Power Operation) at 100 percent power, an unplanned automatic actuation of the standby gas treatment (GTS) and annulus mixing systems occurred. The initiating signal originated in radiation monitor RMS-RE11B(\*\*RIS\*\*), which monitors the reactor building annulus for gaseous activity. The GTS and annulus mixing systems responded to the radiation signal as expected.

The event was not initially reported within the timeframe required by 10CFR50.72, because there was no corroborating evidence that radioactivity sufficient to actuate the ventilation process monitors was present in the annulus. The radiation monitor is designed to actuate on high gaseous activity. The root cause determination concluded that the actuation was likely caused by radioactive particulates. NUREG-1022, Rev. 1, describes valid signals as those signals that are initiated in response to actual plant conditions or parameters satisfying the requirements for an engineered safety feature (ESF) initiation. For these reasons, it was initially determined that this event did not meet the criteria of a valid ESF actuation and was not reportable.

Subsequent discussion with the NRC determined that this event was considered valid and reportable. The NRC was formally notified of the event in accordance with 10CFR50.72 on March 15, 2000. An LER is required in accordance with 10CFR50.73(a)(2)(iv) due to the automatic actuation of an ESF system.

**BACKGROUND INFORMATION**

The River Bend design includes a shield building that completely encloses the steel primary containment structure and serves as a secondary containment. The annular space between these two structures is normally maintained at slightly below ambient atmospheric pressure by the annulus pressure control system (APCS).

The GTS serves as a backup to the APCS during normal operation. Upon loss of the APCS or upon an ESF signal (i.e., LOCA or high radiation signal from either radiation monitor located in the annulus airstream), the annulus air and air from the shielded compartments in the auxiliary building are automatically diverted through the GTS filter train.

The annulus mixing system is provided for a thorough mixing of any leakage from the primary containment to the annulus. Upon receipt of a LOCA or high radiation signal from the radiation monitor(s), the annulus mixing system is automatically actuated.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

| FACILITY NAME (1)  | DOCKET (2)<br>NUMBER (2) | LER NUMBER (6) |                      |                    | PAGE (3) |
|--------------------|--------------------------|----------------|----------------------|--------------------|----------|
|                    |                          | YEAR           | SEQUENTIAL<br>NUMBER | REVISION<br>NUMBER |          |
| River Bend Station | 05000-458                | 00             | -- 04 --             | 00                 | 3 OF 4   |

**INVESTIGATION AND IMMEDIATE CORRECTIVE ACTIONS**

At 1925 on December 27, 1999, the RMS-RE11B radiation monitor went into 'alert' condition. Approximately two minutes later, the monitor went into 'alarm' condition, at which time the GTS and annulus mixing systems automatically started. The monitor reading trended upward, then cycled between the 'alert' and 'alarm' setpoints for approximately fifteen minutes. Once the radiation monitor's filter cartridge was changed, the readings returned to the normal operating range.

Radiation levels on the RMS-RE11A monitor were verified to be normal throughout the event. A grab sample of the annulus atmosphere was taken and verified to be normal. No other radiation monitors indicated abnormal conditions. The standby gas treatment and annulus mixing systems were returned to their normal standby configuration.

Based on this information, it was initially concluded that no actual high radiation condition existed in the annulus. However, the monitor response was not indicative of a voltage transient or electrical noise. The minimal amplitude value of the transient coupled with the ramp up time (and alarm cycling) of the indication suggests the presence of a radiation source at the detector. The radiation monitor vendor concurred with this conclusion.

Troubleshooting of the RMS-RE11B monitor revealed that the filter cartridge was incorrectly installed, such that sample flow could bypass the filter. A survey of the filter paper determined it to be contaminated. A charcoal cartridge downstream of the filter assembly provides for the removal of iodine, however, it is not designed to filter particulate matter. The detector in the sample chamber was determined to be responding correctly.

**ROOT CAUSE AND CORRECTIVE ACTIONS TO PREVENT RECURRENCE**

Based on the investigation, it is concluded that particulate matter which bypassed the filter and passed through the charcoal cartridge to the sample chamber likely caused the signal. Corrective actions to prevent recurrence are being tracked in River Bend's corrective action program.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

| FACILITY NAME (1)  | DOCKET (2)<br>NUMBER (2) | LER NUMBER (6) |                      |                    | PAGE (3) |
|--------------------|--------------------------|----------------|----------------------|--------------------|----------|
| River Bend Station | 05000-458                | YEAR           | SEQUENTIAL<br>NUMBER | REVISION<br>NUMBER | 4 OF 4   |
|                    |                          | 00             | -- 04 --             | 00                 |          |

**PREVIOUS OCCURRENCE EVALUATION**

A review of recent Licensee Event Reports was conducted. No instances were found in which GTS or other similar systems were actuated or isolated due to a radiation monitor signal resulting from the detection of unfiltered radioactive particulate matter.

**SAFETY SIGNIFICANCE**

When the RMS-RE11B radiation monitor went into the alarm condition, the GTS and annulus mixing systems automatically started and operated as designed. The systems operated for approximately two hours and forty-seven minutes while the radiation monitor was reworked and put back in service. At that point, the emergency ventilation systems were restored to their normal standby configuration. This event did not involve any loss of safety function and this LER is not a safety system functional failure.

It is likely that the monitor actuated conservatively upon the introduction of unfiltered particulate matter. The RMS-RE11B radiation monitor would also have indicated any change due to actual airborne gas activity. For these reasons, this event was not significant with respect to the health and safety of the public.

(Note: Energy industry component identification codes are annotated in the text as (\*\*XXX\*\*).)