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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. 91-022 for River Bend Station - Unit 1. This report is submitted pursuant 10CFR50.73.

Sincerely,

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

LAE/PDG/GAB/DCH/TAR/kvm

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED (-)MB NO. 3150-0104
EXPIRES 4/30/92
ESTIMATED 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 (P-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)	DOCKET NUMBER (2)	PAGE (3)
ROVER BEND STATION	0 5 0 0 0 4 5 8	1 OF 0 5

TITLE (4): INDETERMINATE EQUIPMENT QUALIFICATION STATUS OF RESISTANCE TEMPERATURE DETECTORS IN THE FUEL BUILDING FILTER TRAINS

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 2	2 3	9 1	9 1	- 0 2 2	- 0 0	0 1	2 2	9 2		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	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)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		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
L.A. ENGLAND, 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	

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 12/23/91, with the reactor in Operational Condition 4, it was discovered that from 6/4/91 to 6/8/91, fuel was moved in the fuel building while resistance temperature detectors (RTDs) installed in the fuel building heater trains were not environmentally and seismically qualified. Thus, the fuel building filter trains are considered to have been inoperable. Therefore, this report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as operation prohibited by the Technical Specifications.

The subject RTDs have been replaced with qualified models. Training will be provided on the importance of communication when performing operability analyses.

GSU has performed an ambient humidity analysis and a decay time analysis for the fuel in the spent fuel pool. The results show that it was unlikely that fuel building charcoal filter efficiency was degraded and that if a fuel handling accident had occurred, offsite doses would have been bounded by the design basis fuel handling accident calculation.

REPORTED CONDITION

On 12/23/91, with the reactor in Operational Condition 4, it was discovered that from 6/4/91 to 6/8/91, fuel was moved in the fuel building (*ND*) while resistance temperature detectors (RTDs) (*26*) installed in the fuel building heater trains (*VG*) were not environmentally and seismically qualified. Thus, the fuel building filter trains (*VG*) are considered to have been inoperable. Therefore, this report is submitted pursuant to 10CFR50.73(a)(2)(i)(B) as operation prohibited by the Technical Specifications.

INVESTIGATION

A review of Pyco RTD documentation was performed by GSU as a result of a 10CFR21 notification issued by Niagara Mohawk Power Corporation. GSU's investigation identified RTDs in the standby gas treatment system (SGTS) (*BH*) filter trains, control building chilled water system (*VI*), and the fuel building filter trains (*VG*) as not being environmentally or seismically qualified. The RTDs provided by Stone and Webster Engineering Corporation (SWEC) for River Bend Station (RBS) were not installed to Pyco's designed and qualified configuration. SWEC redesigned the original qualified Pyco configuration for Model 122-4030 RTDs (*26*) to allow installation without a thermowell to improve the response time. This specific Pyco RTD model requires a thermowell in order to provide a moisture proof seal per Pyco test report 16436-82N, Rev. 5. This deficiency could cause moisture intrusion into the RTD's electronic components, resulting in failure. SWEC performed an engineering analysis of this configuration (installed under E&DCR P-41,000) and determined it to be qualified. However, the available information supporting this position was inadequate. Therefore, the RTDs could not be considered environmentally qualified. The absence of the thermowell also rendered the RTDs seismically unqualified.

In April 1991, an operability analysis was performed on the systems affected by the RTD problem. The fuel building filter trains (*VG*) were determined to be operable for normal operations, no fuel movement, with the RTDs seismically and environmentally unqualified. The operability of the fuel building filter trains (*VG*) during fuel movement was not considered at that time because no fuel movement was taking place and no fuel movement was expected to take place until the fourth refueling outage (RF-4). A modification request was initiated (MR 91-0039) to replace these RTDs; however, the replacement was not implemented prior to the fuel movement during a failed fuel inspection that took place from 6/4/91 to 6/8/91. Proper administrative controls were not put in place prior to RTD replacement.

A tracking limiting condition for operation (LCO) TR 91-136 was initiated on 8/24/91. This tracking LCO prohibits entry into Operational Condition */RF-4 (fuel handling per the applicability statement of

Technical Specification 3.6.5.6) prior to RTD replacement. The concern that prompted its initiation is the possibility of a full core off-load during RF-4. A hypothetical accident could occur in which the higher heat load in the pool could cause boiling in the pool and thus put the filters in a harsh (i.e., steam) environment. This was not a major concern during the fuel inspection because the heat load in the pool was lower and there was no possible accident which would cause a harsh environment to exist.

ROOT CAUSE

The operability analysis that was performed for both the SGTS and fuel building filter trains was adequate. The urgency of the SGTS operability analysis overshadowed the proper documentation and communication of the assumptions and conditions that went into the fuel building filter train operability analysis. The root cause was that the basis of the analysis was not properly communicated which led to insufficient implementation of administrative controls. It should have been communicated that operability had not been determined for the condition of moving fuel in the fuel building.

A similar event was identified in LER 91-007. In this case, the SGTS was considered to have been inoperable due to the questionable qualification status of the Pyco RTDs. An operability analysis defined acceptable auxiliary building humidity levels for which the SGTS could be considered operable with the unqualified RTDs. This analysis permitted RTD replacement while maintaining the SGTS operable. As previously stated, the original Pyco RTD design was redesigned by SWEC and available documentation did not support qualification of the installed configuration.

CORRECTIVE ACTION

As previously stated, LCO TR 91-136 served as an administrative restriction on entering Operational Condition * prior to RTD repair or replacement. However, the original RTDs have been replaced with qualified models, and thus the LCO has been cancelled.

Training will be provided for the Engineering Analysis Group on the importance of communication when performing operability analyses. This event will be used as an example. This training is currently scheduled to be completed by 3/4/92.

SAFETY ASSESSMENT

One of the intended functions of the fuel building filter trains is to mitigate the consequences of a fuel handling accident (FHA) by limiting

offsite doses to within 10CFR100 guidelines. The design basis FHA calculation (PR(C)-418) is a bounding calculation which determines the dose from an FHA assuming a filter efficiency of 99%, a bundle drop from maximum height, a maximum breakage of pins, and a decay time of 24 hours.

The concern with the RTDs is that if the RTDs fail to operate properly, the heater may not operate. If the heater fails, the humidity of the air passing through the filter will increase. This can degrade the efficiency of the filter and therefore, its ability to remove radioactive iodines. Thus, with degraded RTDs, the design basis FHA calculation may not be bounding.

The safety assessment of this event considered two approaches. The first was to assume that the ambient humidity was equal to the humidity of the fuel building and then determine if the filter efficiency was degraded at the time of fuel movement. The second approach was to calculate, based on the spent fuel pool loading at the time of the fuel movement, the time it would take for the radioiodines to decay to the point at which the calculated doses would be bounded by the FHA without taking credit for the charcoal filter trains at all (0% efficiency).

AMBIENT HUMIDITY ANALYSIS

The filter efficiency would have degraded only if the relative humidity in the Fuel Building was above 95%. The humidity inside the building is driven by the moisture content of the outside air, the moisture added by the spent fuel pool, and the moisture removed by the fuel building unit coolers. It is difficult to quantify the relative humidity in the fuel building during the failed fuel inspection because of the lack of information about the ambient conditions both inside and outside the building.

The relative humidity outside during the failed fuel inspection did not rise above 95% at Ryan Airport (National Weather Service Information). The relative humidity at River Bend is expected to be similar to that at Ryan Airport. Also, one radwaste chiller was operating throughout the fuel inspection (per auxiliary control room logs), so cooling was available to the fuel building unit coolers. Given what is known about the ambient conditions, it is unlikely that the relative humidity in the fuel building exceeded 95% during the inspection. Since this provides only a qualitative analysis having the crude assumption that the fuel building humidity was similar to that at Ryan Airport, a decay time analysis was performed.

DECAY TIME ANALYSIS

In an FHA, the offsite and control room doses are due to the release of fission product gases from the fuel building. Using a conservative calculation, GSU has determined that a 57 day decay time will remove at least as much of the initial activity of the fission gases as a 99% efficient charcoal filter. Note that the design basis FHA calculation assumes that an FHA cannot occur until 24 hours following shutdown, thus providing a 24 hour decay time following shutdown. Therefore, if the decay time of the spent fuel is 58 days, then the calculated doses will be within the design basis FHA calculation, even if filter efficiency is degraded to 0%.

Spent fuel was moved for a failed fuel inspection which started at 1424 hours on 6/4/91 and ended at 1209 hours on 6/8/91 (per control room logs). All of the fuel in the pool had decayed since the beginning of the third refueling outage, approximately 9 months before. This decay time is significantly greater than 58 days; therefore, if an FHA had occurred, the offsite doses would have been bounded by those calculated in the design basis FHA calculation.

Another reason why the design basis FHA calculation was conservative is that the fuel movement was not directly over other spent fuel. This careful planning ensured that if a bundle was dropped, it would not drop directly on other spent fuel. Since a direct drop was not a possibility, the number of pins assumed to break in the design basis FHA calculation is greater than the number of pins that could actually have broken.

CONCLUSIONS

The ambient humidity analysis shows qualitatively that it was unlikely that fuel building humidity levels exceeded 95%. Thus, even if it is assumed that the RTDs fail, followed by the heaters, it was unlikely that the fuel building charcoal filter efficiency was degraded during the fuel movement.

The decay time analysis demonstrates that even if the worst case is assumed, that the fuel building filter train charcoal filters were incapable of performing their design function, offsite doses would still be bounded by the design basis FHA calculation.