NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
River Bend Station	05000-458	1 of 5

TITLE (4)

Inadequate Surveillance Testing of Diesel Generator Trip Functions Due To Improper Implementation of Improved Technical Specifications

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
										05000
05	20	1999	1999 -	12	00	06	21	1999	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	5
POWER LEVEL (10)	0%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

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)	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	TELEPHONE NUMBER (Include Area Code)
D. N. Lorfing, Supervisor - Licensing	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)		EXPECTED	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	✓ NO				

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

On May 20, 1999, with the plant in a refueling outage, an engineering review related to emergency diesel generator operation discovered a potential problem regarding compliance with Surveillance Requirement (SR) 3.8.1.12, as described in the Technical Specification (TS) bases. The specific concern was that the Division I, II, and III diesel generator (DG) differential current trip function circuitry may not have been fully tested. Upon identification of the condition, SR 3.0.3, which allows up to 24 hours to perform a missed surveillance, was applied and test procedures were prepared. When testing of one diesel was not completed within 24 hours, TS Limiting Condition for Operation (LCO) 3.8.2 actions were taken until one DG was fully tested approximately three hours later. Testing of all DGs was completed by May 29, 1999.

Three factors were determined to be the causes of this condition:(1)Unclear/complex wording in the TS surveillance requirement that does not clearly discuss actions for the two "essential" trips, (2) Insufficient information in the original TS Bases for DG surveillance testing, and (3) Inadequate change management in the development and implementation of the more detailed information included in the TS Bases for this surveillance requirement.

REPORTED CONDITION

On May 20, 1999, with the plant in refueling outage, an engineering review related to emergency diesel generator operation discovered a potential problem regarding compliance with Surveillance Requirement (SR) 3.8.1.12, as described in the Technical Specification (TS) bases. The specific concern was that the Division I, II, and III diesel generator (**DG**)differential current trip function circuitry may not have been fully tested.

Upon identification of the condition, SR 3.0.3, which allows up to 24 hours to perform a missed surveillance, was applied and test procedures were prepared. When testing of one diesel was not completed within 24 hours, TS Limiting Condition for Operation (LCO) 3.8.2 actions were taken until one DG was fully tested approximately three hours later. Testing of all DGs was completed by May 29, 1999.

This condition is being reported in accordance with 10CFR50.73(a)(2)(i)(b) as operations prohibited by Technical Specifications.

BACKGROUND

The River Bend Station (RBS) DGs are equipped with several protective "non-essential" trips that are bypassed during emergency operation. There are two trips listed in the TS which are not bypassed: engine overspeed, and generator differential current. The "non-essential" trips are bypassed as part of the diesel electro-pneumatic logic controls. The engine overspeed trip, which protects against engine and generator destruction in case of a loss of load, will stop the diesel generator during and following an emergency start if the engine speed exceeds the trip setting. The generator differential current trip, which protects against major damage in the internal generator windings, will trip the generator output breaker during and following an emergency start if a current imbalance occurs. Neither of these two "essential" trips are part of the same control logic of the diesel as the "non-essential" trips.

The previous and current RBS TS Bases for SR 3.8.1.12 reference Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," and 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," as the bases for the required surveillance testing. Excerpts of those documents are provided here:

Regulatory Guide 1.9

RG 1.9 (Rev. 2) discusses design features for protection of diesel generators as follows:

> "Protection of the diesel-generator unit from excessive overspeed, which can result from a loss of load, is afforded by the immediate operation of a diesel-generator unit trip, usually set at 115 percent of nominal speed. In addition, the generator differential trip must operate immediately in order to prevent substantial damage to the generator. There are other protective trips provided to protect the diesel-generator units from possible damage or degradation. However, these trips could interfere with the successful functioning of the unit when it is most needed, i.e., during accident conditions. Experience has shown that there have been numerous occasions when these trips have needlessly shut down diesel-generator units because of spurious operation of a trip circuit. Consequently, it is important that measures be taken to ensure that spurious actuation of these other protective trips does not prevent the diesel-generator unit from performing its function."

A specific test of the "protective trip bypass" is listed in RG 1.9, Revision 3, July 1993.

These requirements are clear that the bypass function for the "non-essential" trips are to be tested periodically to ensure that the function prevents tripping of the diesel generators when in the emergency operating mode. However, the guidance does not specifically address testing of the trips that are not bypassed (i.e., "essential" trips).

Regulatory Guide 1.108

This regulatory guide is aimed at ensuring high reliability of emergency diesel generators according to referenced NRC documents. There are no specific periodic tests listed in RG 1.108 that relate to the protective trips, essential or non-essential. It does state, however, that "[a]ll diesel generator protective trips should be in force during diesel generator unit testing."

INVESTIGATION AND IMMEDIATE CORRECTIVE ACTIONS

RBS Technical Specifications contains Surveillance Requirement (SR) 3.8.1.12, which requires verification that each generators' automatic trips are bypassed on an actual or simulated emergency core cooling system (ECCS) initiation signal except the trips for engine overspeed and generator

differential current. In the past, the SR has been interpreted to address verification that the bypass feature of the diesel generator protective trips will function when the diesel is operated in the emergency mode. Verification that these two protective trips (which are not bypassed in the emergency mode of operation) will trip the diesel was not considered part of the SR. In 1995, the Improved Standard Technical Specifications (ISTS) for Boiling Water Reactor 6 plants were implemented at RBS. The ISTS included greater detail and description in TS Bases sections.

The description of the intent of SR 3.8.1.12 in the Bases section of the current RBS Technical Specifications reads as follows:

> "This Surveillance demonstrates that DG non-critical protective functions (e.g., high jacket water temperature) are bypassed on an ECCS initiation test signal and critical protective functions trip the DG to avert substantial damage to the DG unit."

This description of the intent of SR 3.8.1.12 was not included in the previous TS Bases section for diesel generator testing, nor is it specifically required by the regulatory guides and industry standards that formed the basis for diesel generator surveillance testing for RBS. In addition, when the ISTS changes were evaluated and approved, no change in the intent of SR 3.8.1.12 related to the overspeed and differential current trips was identified. A new or revised requirement related to this SR was not identified by the ISTS development and implementation process.

Actions were taken to fully test the generator differential current trip function on all standby DGs. The testing was satisfactory on all devices. It was determined that the engine overspeed protective trips are verified during diesel maintenance each refueling outage.

ROOT CAUSE

Three factors were determined to be the causes of this condition.

- Unclear/complex wording in the TS surveillance requirement that does not clearly discuss actions for the two "essential" trips
- Insufficient information in the original TS Bases for DG surveillance testing
- Inadequate change management in the development and implementation of the more detailed information included in the TS Bases for this surveillance requirement.

PREVIOUS OCCURRENCE EVALUATION

A review of recent Licensee Event Reports was conducted. No instances were found in which Improved Technical Specification implementation caused discrepancies in the station surveillance testing program.

CORRECTIVE ACTIONS TO PREVENT RECURRENCE

In addition to the actions described above, the following actions will be taken:

- A comparison of the other DG surveillance requirements to the information in the TS Bases will be completed.
- Further review of the need to include verification of the trip functions as part of TS will determine if the TS Bases needs to be clarified or changed.
- Verification of the generator differential current trip function will be included in the surveillance program until any additional clarifications are made.

SAFETY EVALUATION

The function of the two essential trip features is a protective feature rather than a safety related design feature. Most engineered safety feature equipment is provided with protective devices designed to trip such equipment when an indication of a fault is detected. These features are designed to prevent self-destruction of a component if a real fault exists, with the equipment thereby becoming unavailable for event mitigation. Therefore, these trips do not directly support the safety function of the DGs.

The safety significance of failure to verify operability of the generator differential trip function of the emergency diesel generators is low. The function of the diesels is to run to provide backup power in the event a loss of offsite power occurs. The trip functions are an integral design feature of the diesel generator units. Testing performed after identification of the condition indicated that the features did function properly.

This condition had no adverse effect on the health and safety of the public.

(NOTE: Energy Industry Identifiers are annotated in the text as (**XX**).)