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)
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	1 OF 0 8

TITLE (4) Containment Penetration Backup Overcurrent Protection Inoperable Due to Inadequate Startup Testing

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)
0 5	2 1	8 8	8 8	- 0 1 9	- 0 1	0 6	3 0	8 8	N/A	0 5 0 0 0
									N/A	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)	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
C.R. Gaines, Event Analysis & Reporting Department Head	AREA CODE 5 0 4 — 4 6 4 - 3 1 3 7

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)

At 1330 hours on June 30, 1988, Waterford Steam Electric Station Unit 3 was operating at 100% power when the failure to provide backup overcurrent protection for Pressurizer Heater Backup Banks (PHBs) 3 and 4 since initial plant startup was identified as reportable. Technical Specification (TS) 3.8.4.1 states that all primary and backup overcurrent devices for containment penetrations listed in TS Table 3.8-1 shall be operable in modes 1 through 4. Backup overcurrent protection for PHBs is provided by a transfer trip circuit that will open the bus feeder breaker if the PHB supply breaker fails to trip within 0.5 seconds of a sensed overcurrent condition. Since the transfer trip circuits for PHBs 3 and 4 were incorrectly wired to the opposite train pressurizer heater bus feeder breaker during initial plant construction, the backup overcurrent protection feature was inoperable and the plant operated in a condition prohibited by TS since initial plant startup.

The root cause of the event is cognitive personnel error. The transfer trip circuits were correctly rewired on May 22, 1988. Since the primary means of overcurrent protection for the PHBs were operable when required and would have functioned as designed, there was no threat to the health or safety of the public or plant personnel.

IE22

Technical Specification (TS) 3.8.4.1 states that all containment penetration conductor overcurrent protective devices (EIIS Identifier EC-51) shown in TS Table 3.8-1 shall be operable in modes 1 through 4. Pressurizer Heater Backup Banks (PHBs) (EIIS Identifier AB-PZR-EHTR) are supplied power by 480V conductors which penetrate the containment building (EIIS identifier NH). These conductors are provided with a primary and backup means of overcurrent protection which will maintain the integrity of the containment penetrations by interrupting power to the conductor in the event of an overcurrent condition. The primary means of overcurrent protection for these conductors is provided by instantaneous and timed overcurrent devices (EIIS Identifiers EC-50 and EC-51) on the PHB supply breakers (EIIS Identifier EC-BKR) from the 3A32 and 3B32 busses (EIIS Identifier EC-BU). The backup means of overcurrent protection is provided by transfer trip relays (EIIS Identifier EC-62) which cause the 3A32 or 3B32 bus feeder breakers (EIIS Identifier EB-BKR) to trip after a time delay of approximately 0.5 seconds if the PHB supply breakers fail to trip on an overcurrent condition (See Figure 1).

PHBs 1 through 3 are powered by supply breakers from the 480V 3A32 Bus. Each supply breaker powers a 480V Power Distribution Panel (PDP) (EIIS Identifier EC-PL) inside containment. These PDPs supply power to individual pressurizer heaters via 480V circuit breakers. The 3A32 Bus is supplied by a feeder breaker from the 4.16KV 3A3S Bus (EIIS Identifier EB-BU). PHBs 4 through 6 are powered by a similar configuration (See Figure 2) for 'B' train components.

TS Surveillance Requirement 4.8.4.1.a.1(b) states that, on a rotating basis, a 10% sample of TS Table 3.8-1 medium voltage (4-15KV) circuit breaker overcurrent devices shall be demonstrated operable by performance of "an integrated system functional test which includes simulated automatic actuation of the system and verifying that each relay and associated circuit breaker and control circuit functions as designed and as specified in Table 3.8-1." Procedure ME-3-300, "6.9 KV Overcurrent Protective Device Functional Test," was written to satisfy the above surveillance requirement for 6.9 KV breakers listed in TS Table 3.8-1.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	8 8	— 0 1 1 9	— 0 1	0 3 OF 0 8

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

Site Quality personnel initiated Project Evaluation/Information Request (PEIR) 25001 on November 7, 1986, following a routine review of surveillance procedures. The PEIR questioned if the "integrated functional test" surveillance requirement also applied to the 4.16KV breakers which provide containment penetration backup overcurrent protection for the Control Element Drive Mechanism (CEDM) Cooling Units (EIIS Identifier VA-CLR), the Polar Crane (EIIS Identifier LR-CRN), and Pressurizer Heaters, based on the wording of the TS surveillance, "By verifying that the medium voltage (4-15 KV) circuit breakers are operable..."

Nuclear Operations Engineering (NOE) personnel evaluated PEIR 25001 and determined that an integrated system functional test should be performed on the 4.16KV breakers which provide backup overcurrent protection via transfer trip relays. NOE recommended that the integrated functional test be performed in conjunction with related surveillances during the second refueling outage. Procedure ME-7-300, "480 VAC Overcurrent Protective Device Functional Test," was approved on March 22, 1988, as a result of the NOE recommendation that an integrated functional test be performed. ME-7-300 was not, however, considered to be a TS Surveillance since the conductor voltage penetrating containment is only 480V and not the medium (4-15 kv) voltage specified by TS Surveillance 4.8.4.1.a.1(b).

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	8 8	— 0 1 9	— 0 1	0 4 OF 0 8

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

While performing ME-7-300 during the second refueling outage, Maintenance personnel discovered the transfer trip circuitry for the supply breaker to PHB 4, RC-EBKR-32B-4C, caused the 'A' train 3A32 Bus feeder breaker, SSD-EBKR-3A-8, to trip instead of the 'B' train 3B32 Bus feeder breaker, SSD-EBKR-3B-9. Condition Identification (CI) 255945 was initiated at 1050 hours on May 21, 1988, to identify the discrepancy. Subsequent investigation under the CI also discovered that, conversely, the transfer trip circuitry for the supply breaker to PHB 3, RC-EBKR-32A-5A, would have caused SSD-EBKR-3B-9 to trip. The output contacts of the PHB 3 and 4 supply breaker transfer trip relays had been reversed in a relay cabinet, evidently, during initial construction. This condition would have resulted in a trip of the bus feeder breaker in the opposite train from an overcurrent condition due to a short inside containment on PHB 3 or 4 with the associated 480V heater breaker failing to trip. Thus, the backup overcurrent protection for PHBs 3 and 4 was inoperable, and the plant had operated in a condition prohibited by TS since initial plant startup.

Wiring from the output contact of the transfer trip relays for the respective supply breakers to the bus feeder breaker trip circuits had been reversed. Work authorization (WA) 01018451 returned the circuitry to the design configuration shown on the applicable Control Wiring Diagrams (CWDs) on May 22, 1988. At 1330 hours on June 30, 1988, Waterford Steam Electric Station Unit 3 was operating at 100% power when, during a review of CIs for trending purposes, Event Analysis and Reporting Department personnel discovered that CI 255945 identified a condition prohibited by TS. The above condition described in the CI was not recognized to be reportable by the personnel initially involved since the procedure which identified this discrepancy was not designated as a TS Surveillance.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	8 8	— 0 1 9	— 0 1	0 5 OF 0 6

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

The manner in which TS Surveillance Requirement 4.8.4.1a.1 is currently stated implies that only the medium voltage (4-15KV) conductors penetrating containment require an "integrated functional test." Surveillance testing since plant startup has met this requirement by integrated functional testing of the four 6.9 KV Reactor Coolant Pump supply and feeder breakers (EIIS Identifier EA-BKR). Although the transfer trip relays which provide backup overcurrent protection for the PHBs, CEDM Cooling Units, and the Polar Crane, are functionally checked and calibrated per procedure ME-3-310, "Calibration of Time Delay Relays," ME-3-310 only checks the pickup voltage and timing of the relay and does not check the position of the respective output contacts. Testing the transfer trip relay response times per ME-3-310 satisfies a portion of TS Surveillance 4.8.4.1.a.2. TS Surveillance 4.8.4.1.a.1(b) does not require integrated functional testing of the above transfer trip devices; however, it is believed to be more prudent to demonstrate the operability of this means of backup overcurrent protection by performing an integrated functional test. A Technical Specification Change Request to include integrated functional testing of this transfer trip circuitry will be submitted by October 31, 1988.

A review of testing performed prior to initial plant startup revealed that overlapping functional testing of the control circuits for the CEDM Cooling Units and Polar Crane had been performed. This was not the case, however, with the PHB control circuits. Apparently, the portion of the transfer trip circuit for each PHB located in Auxiliary Panel 4 (EIIS Identifier EC-PL) had been overlooked. This resulted in not discovering the discrepancy in this vendor-supplied wiring. Thus the root cause of the event is cognitive personnel error in that the PHB wiring was not connected in accordance with design documentation by the vendor and subsequently overlooked during pre-startup testing.

A visual inspection has been performed on the vendor-supplied wiring for the 3A31, 3A32, and 3B31 bus transfer trip circuits tested per ME-7-300. This consists of the Auxiliary Panel 4 portion of the transfer trip circuits for the CEDM Cooling Units, Polar Crane, and PHBs 1 through 3. An integrated functional test of the 3B32 bus transfer trip circuits has been satisfactorily conducted per ME-7-300. A special test was performed to functionally test the transfer trip circuits which provide backup overcurrent protection for the 'A' train PHBs (3A32 Bus). This test was completed on September 14, 1988. Since the primary means of overcurrent protection for the PHB containment penetration conductors was operable when required and would have functioned as designed, there was no threat to the health or safety of the public or plant personnel.

SIMILAR EVENTS

LER 87-026

PLANT CONTACT

C.R. Gaines, Event Analysis & Reporting Department Head, 504/464-3137

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	8 8	— 0 1 9	— 0 1	0 7 OF 0 8

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

RIP CIRCUIT FOR PRESSURIZER HEATERS

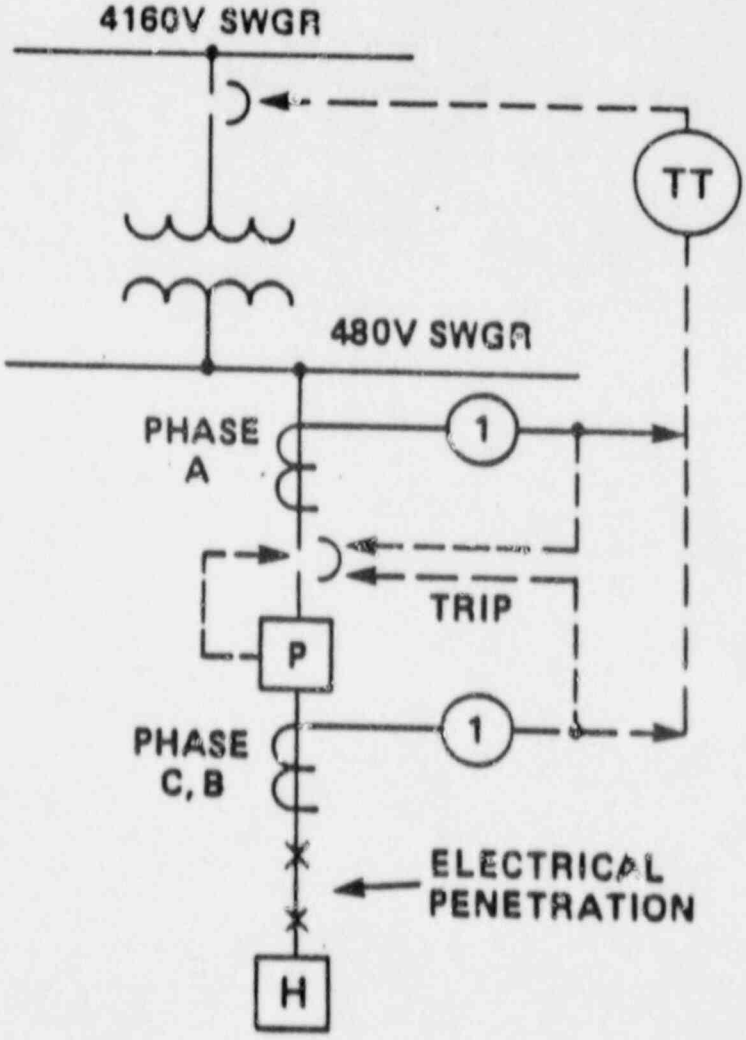

FIGURE 1

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Waterford Steam Electric Station unit 3	0 5 0 0 0 3 8 2	8 8	— 0 1 9	— 0 1	0 8 OF 0 8

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

DISTRIBUTION FOR 480V PENETRATIONS WITH TRANSFER TRIP BACKUP OVERCURRENT PROTECTION

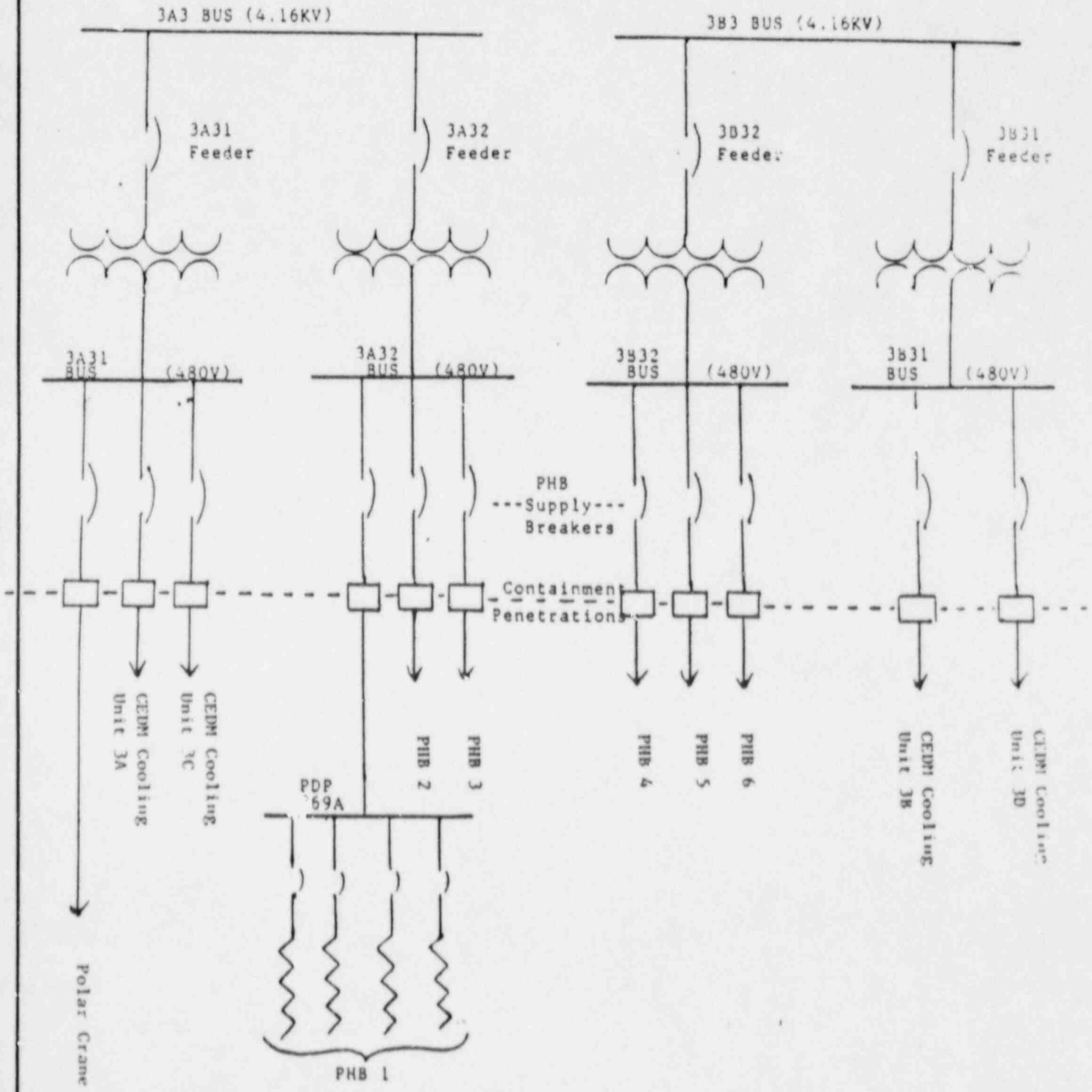

FIGURE 2

LOUISIANA POWER & LIGHT / WATERFORD 3 SES • P.O. BOX B • KILLONA, LA 70066-0751

MIDDLE SOUTH UTILITIES SYSTEM

Ref: 10CFR50.73(a)(2)(i)

September 30, 1988

W3A88-0111
A4.05
QA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Reporting of Licensee Event Report

Attached is Licensee Event Report Number LER-88-019-01 for Waterford Steam Electric Station Unit 3. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(i).

Very truly yours,

N.S. Carns
Plant Manager - Nuclear

NSC/WEM:jc

Attachment

cc: R.D. Martin, NRC Resident Inspectors Office, INPO Records Center (J.T. Wheelock), E.L. Blake, W.M. Stevenson, D.L. Wigginton

IE22
1/1