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

MIDDLE SOUTH UTILITIES SYSTEM

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

W3A90-0141
A4.05
QA

April 30, 1990

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

Gentlemen:

Attached is Licensee Event Report Number LER-90-003-00 for Waterford Steam Electric Station Unit 3. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(iv).

Very truly yours,

J.R. McGaha
Plant Manager - Nuclear

JRM/JEF/rk

(w/Attachment)

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

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES 8/31/88

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 4

TITLE (4)

Reactor Trip Due to Grid Disturbance

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)
										N/A	0 5 0 0 0
0 3	2 9	9 0	9 0	— 0 0 3	— 0 0		0 4	3 0	9 0	N/A	0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
1	20.402(b)		20.405(c)	X	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)	73.71(c)
1 0 0	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)		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
T.H. Smith, Plant Engineering Superintendent	5 0 4 4 6 4 - 3 1 2 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 0730 hours on March 29, 1990, with Waterford Steam Electric Station Unit 3 at 99.9% power, a severe transient on the 230 KV power distribution grid at Taft, Louisiana, resulted in a reactor trip. The transient was initiated when an Occidental Chemical Company employee caused a fault at the 230 KV substation owned by the chemical company. The reactor coolant pumps slowed to less than 96.5 % of normal speed as voltage dropped. This generated a low multiplier in the Core Protection Calculators and a reactor trip occurred due to an anticipatory Departure from Nucleate Boiling Ratio trip signal. This event is reportable as an automatic reactor protection system actuation.

As a result of this system transient, a degraded voltage condition occurred on the 4.16 KV 'B' safety bus when a 'B' bus tie breaker opened automatically which de-energized the 'B' safety bus. Emergency Diesel Generator 'B' started and re-energized the 'B' safety bus as designed. The root cause of this event was a 230 KV grid fault at Occidental Chemical Company. Because plant protective features functioned as designed, this event did not threaten the health or safety of the general public or plant personnel.

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Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	9 0	— 0 0 3	— 0 0	0 2 OF 0 4

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

At 0730 hours on March 29, 1990, with Waterford Steam Electric Station Unit 3 at 99.9% power, a severe transient on the 230 KV power distribution grid at Taft, Louisiana, resulted in a reactor trip. The transient was initiated when an Occidental Chemical Company employee opened an energized 230 KV switch in the substation owned by the chemical company during scheduled maintenance. Opening the switch developed an arc which flashed to ground. The fault was cleared in approximately .5 seconds. The fault, however, burned the shield wire above the switch and the shield wire fell across the 230 KV line. The station was re-energized by automatic reclosing approximately 30 seconds later, placing a three-phase fault on the system. This fault also lasted approximately .5 seconds. Voltage dipped severely throughout the South Louisiana service area.

The grid voltage dropped from 230 KV to about 34 KV for approximately .5 seconds causing the reactor coolant pumps (RCPs) (EIIS Identifier AB-P) to slow to less than 96.5 % of normal speed as sensed by the core protection calculators (CPCs) (EIIS Identifier JC-CPU). The CPCs generated a 0.1 multiplier which adjusted the existing calculated Departure from Nucleate Boiling Ratio (DNBR) of approximately 1.5, to a value significantly less than the low DNBR trip setpoint of 1.26, which initiated a reactor trip. In addition, the steam generator feed pump (SGFP) turbine overspeed trip solenoid (EIIS Identifier SJ-TRB-SSV) opened on undervoltage dumping governor control oil and causing a SGFP turbine trip. The emergency feed water (EFW) system (EIIS Identifier - BA) actuated as designed and was used to manually feed the steam generators for approximately one hour and forty-one minutes.

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

One of the two bus tie breakers (EIIS Identifier - BKR) from the 4.16 KV 'B' safety bus (EIIS Identifier - EB) to the 'B' non-safety bus opened. Emergency Diesel Generator (EDG) 'B' (EIIS Identifier - EK) started and aligned to 'B' safety train components as designed. The 'AB' safety bus was aligned to the 'B' safety bus at the time of the event, resulting in many non-essential loads automatically tripping off, requiring manual restoration. The voltage transient disconnected the steam bypass control system (SBCS) (EIIS Identifier - JI) from the automatic mode and forced closed all SBCS valves. SBCS was not immediately available. When the reactor tripped, pressure increased to 1100 psia in both steam generators. Steam generator pressure control and reactor coolant system heat removal was accomplished by the automatic operation of the atmospheric dump valves (EIIS Identifier SB - PCV) and the main steam safety valves (EIIS Identifier SB - RV) until control power was restored to the SBCS.

The 4.16 KV 'B' safety bus was restored to its normal off-site power supply at 0805 and EDG 'B' was secured. This event is reportable as an automatic reactor protection system actuation.

The root cause of this event was the severe grid voltage transient caused by Occidental Chemical Company. An investigation was conducted to determine why the 'B' safety bus tripped on undervoltage and transferred to EDG'B'. It was concluded that 4.16 KV 'B' safety bus voltage probably dropped lower than the 'A' bus because of the additional loads on the 'B' bus as compared to the 'A' bus. Therefore, when the fault occurred, the voltage levels fell within the undervoltage relay operating limits and tolerances for the 'B' safety bus but not for 'A'. After review of calibration data for the undervoltage relays of the 'A' and 'B' safety buses, it was determined there was no need to recalibrate these relays.

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

Because plant protective features functioned as designed, this event did not threaten the health or safety of the general public or plant personnel.

Similar Events

None

Plant Contact

T.H. Smith, Plant Engineering Superintendent, 504-464-3127.