

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) THREE MILE ISLAND, UNIT 1

DOCKET NUMBER (2) 05000218191 OF 05

TITLE (4) PARTIAL LOSS OF OFFSITE POWER

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)
04	21	86	86	008	01	08	12	86			050000

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

OPERATING MODE (9)	20.402(b)	20.405(e)	50.73(a)(2)(iv)	73.71(b)
N	20.405(a)(1)(i)	50.38(e)(1)	50.73(a)(2)(v)	73.71(c)
POWER LEVEL (12) 000	20.405(a)(1)(ii)	50.38(e)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 356A)
	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)(ix)	

LICENSEE CONTACT FOR THIS LER (12)  
NAME SUSAN M. OTTO, TMI-1 LICENSING ENGINEER  
TELEPHONE NUMBER 717 948-8355  
AREA CODE 717

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	E	B	00526702	Y					

SUPPLEMENTAL REPORT EXPECTED (14)  
YES (If yes, complete EXPECTED SUBMISSION DATE) X NO  
EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

TMI-1 had just achieved a hot shutdown condition following an Eddy Current Outage. Preparation for tap change on the "B" Auxiliary Transformer required all loads to be placed on the "A" Transformer. The "D" 4160V Bus was transferred. When breaker 1SA-D2 was closed, an electrical fault occurred which tripped open both incoming breakers to the "D" Bus, de-energizing the "D" 4160V Bus and three 480V buses. The fault was seen on the "A" Transformer, causing it to trip. This caused the Reactor Coolant Pumps to trip, loss of secondary plant components, control rod insertion, and emergency feedwater to be initiated manually. The Reactor Coolant System transitioned into natural circulation. Normal electric power supply distribution was restored.

The cause of the breaker failure is attributed to the breaking of the brazed joint between the through-stud and hinge plate. This is an isolated incident.

8608200311 860812  
PDR ADOCK 05000289  
S PDRT822  
11

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9	8 6	— 0 0 8	— 0 1	0 2	OF 0 3	

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

PARTIAL LOSS OF OFFSITE POWERI. Plant Operating Conditions Before the Event

The plant had just achieved a hot shutdown condition following completion of the license-required Eddy Current Testing Outage.

II. Status of Structures, Components, or Systems that Were Inoperable at the Start of the Event and that Contributed to the Event

There was no equipment out of service prior to the event which had any bearing on the outcome of the event.

III. Event Description

On April 21, 1986, transformer tap changes had been completed on the "A" Auxiliary Transformer (XFMR) and preparation for the "B" Auxiliary Transformer tap changes were in progress to support plant startup. Preparation for the "B" transformer tap change included transferring all plant electrical loads from the "B" Auxiliary Transformer to the "A" Auxiliary Transformer. At the time of the incident the following loads had already been transferred to the "A" transformer:

1A 6900V Bus  
1B 6900V Bus  
1A, 1B, 1C 4160V Bus

The next bus (BU) to be transferred to the "A" transformer was the "D" 4160V Bus. At 0935 hrs., breaker 1SA-D2 was closed ("A" transformer feeder to the "D" 4160V Bus) resulting in an electrical fault which tripped open both incoming breakers to the "D" Bus (1SA-D2 and 1SB-D2) de-energizing the "D" 4160V Bus and "N", "P" and "R" 480V switchgear (SWGR). The following components immediately tripped and events occurred as a result of the loss of the "D" 4160V Bus:

SF-P-1A  
SC-P-1C  
AH-E-1A and 1C  
MU-P-1B (from loss of lube oil pumps)  
NS-P-1A and 1B  
NR-P-1A  
Start of EG-Y-1A (loading did not occur)  
Loss of the Plant Normal Page System (the emergency Red phone page system remained operable)

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)  THREE MILE ISLAND, UNIT 1	DOCKET NUMBER (2)  0500028986	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
			008	01	03	OF	05

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

III. Event Description (Cont'd)

The ground fault which occurred was from the primary side of breaker 1SA-D2 to ground. When the breaker tripped open, the fault therefore did not clear. The fault was seen as a ground on the "A" Auxiliary transformer. This resulted in all the breakers for the incoming lines to the #8 230KV Bus opening up to de-energize the TMI-1 "A" Auxiliary transformer and the TMI-2 "B" Auxiliary transformer. The effect on TMI-2 was minor because of the automatic transfer scheme which exists. This automatic transfer swapped all of the TMI-2 loads which were powered from the "B" Auxiliary transformer to the "A" Auxiliary transformer. A similar automatic transfer scheme exists at TMI-1 for the BOP 6900V and 4160V buses. This automatic transfer scheme was defeated in TMI-1 at the time of the event because the control switches for all of the breakers which would have closed to supply power from the "B" Auxiliary transformer were in pull-to-lock. The breakers were in pull-to-lock temporarily as part of the sequence for taking the "B" Auxiliary transformer out of service for the tap changes. As a result, the following buses were de-energized: 1A and 1B 6900V, 1A, 1B and 1C 4160V. This occurred 6 seconds after the initial fault on 1SA-D2. At this point, the only bus which was not de-energized was the "E" 4160V bus because it had not yet been transferred from the "B" Auxiliary transformer to the "A" Auxiliary transformer.

When the "A" Auxiliary transformer was de-energized, the following events took place:

- \*All 4 RC pumps tripped
- \*All secondary AC powered equipment tripped;  
circulating water pumps, condensate pumps, condensate booster pumps, feedwater pumps, vacuum pumps, Turbine support equipment, Auxiliary boilers, secondary services closed cycle cooling pumps
- \*The emergency DC pumps for turbine support started
- \*The reactor tripped (on flux/pumps trip)

When the control room operator realized that main feedwater had been lost, he manually started an electric driven emergency feedwater pump to supply water to the Steam Generators. The emergency feedwater pumps did not automatically start because the auto start circuit was still in defeat per the design and operating procedure. Restoration of power to all of the de-energized buses except "D" 4160V occurred by energizing the buses from the "B" Auxiliary transformer. The "P" 480V switchgear was powered by cross-tying it to the "S" 480V switchgear.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
THREE MILE ISLAND, UNIT 1	0 5 0 0 0 2 8 9	8 6	— 0 0 8	— 0 1	0 4	OF 0 5

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

III. Event Description (Cont'd)

At 0955 hours, RC-P-1B was started resuming a forced flow mode of circulation in the RCS. Starting of remaining Reactor Coolant pumps was completed with RC-P-1A at 1230 hrs. The "D" 4160V bus was tested to verify that there was no fault on the bus. 1SA-D2 breaker was replaced with a substitute and all loads were transferred to the "A" transformer to complete the "B" transformer tap change. By approximately 1300 hrs., the normal electric power supply distribution was restored. Operation using emergency feedwater continued until 1405 hrs. while feedwater chemistry was returned to specifications.

IV. Component Failure Data

Component Name - 4160V Class 1E Circuit Breaker  
System Name - Medium Voltage Power System - Class 1E  
Cause Code - X - Joint Failure - Isolated Event  
Manufacturer/Model - Westinghouse 50DH-P 350  
NPRDS Reportable - Yes  
Method of Discovery - Relay Operation and Smoke

V. Automatic or Manually Initiated Safety System Responses

Safety systems responded as designed during this event. Emergency Diesel Generator 1A automatically started on a loss of power to the "D" 4160V bus but did not load onto the bus because the bus overcurrent lockout had tripped as designed. The emergency feedwater system was manually initiated and functioned properly during this event.

VI. Assessment of the Safety Consequences and Implications of the Event

There were no challenges to Nuclear Safety during this event. The plant systems are designed to cope with a loss of offsite power with only one class 1E bus available. The plant operated in this configuration for only a short period of time until power was restored to all buses except the "D" 4160V bus. All components and systems operated as required during this event. Damage from the fault was limited to the failed breaker.

This sequence of events is performed as a prerequisite to criticality and is not performed with the reactor critical.

VII. Previous Events of a Similar Nature

There were no previous events at TMI-1 similar to this event.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)  THREE MILE ISLAND, UNIT 1	DOCKET NUMBER (2)  0 5 0 0 0 2 8 9 8 6 — 0 0 8 — 0 1 0 5 OF 0 5	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

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

VIII. Corrective Actions Planned

1. The process of changing auxiliary transformer taps will be proceduralized to include making all the required transfers prior to placing any breakers in the pull-to-lock position. This will allow an automatic bus transfer to occur during the transfer if required.
2. The cause of the failed breaker (1SA-D2) was investigated. The breaker hinge plate and movable contact assembly separated from the porcelain pole unit through-stud when the brazed joint between hinge plate and through-stud broke. The downward force of the hinge assembly during separation then caused the breaking of the porcelain contact lift rod and puffer tube. Westinghouse indicated that no failure of this type has been reported to them in either nuclear or fossil application. The failure is believed to be an isolated event. No further action is planned.



GPU Nuclear Corporation  
Post Office Box 480  
Route 441 South  
Middletown, Pennsylvania 17057-0191  
717 944-7621  
TELEX 84-2386  
Writer's Direct Dial Number:

August 12, 1986  
5211-86-2133

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

Dear Sir:

Three Mile Island Nuclear Station Unit 1 (TMI-1)  
Operating License No. DPR-50  
Docket No. 50-289  
LER 86-008-01

This letter transmits License Event Report (LER) No. 86-008-01 which deals with a Partial Loss of Offsite Power. LER 86-008-00 was submitted May 21, 1986. At that time, the cause of the breaker failure was unknown. The cause has now been determined therefore this supplemental report is being submitted.

This LER is being submitted pursuant to 10 CFR 50.73, using the required NRC forms (attached). NRC Form 366 contains an abstract which provides a brief description of the event. For a complete understanding of the event, refer to the text of the report which appears on Form 366A.

Sincerely,

H. D. Hukill  
Vice President & Director, TMI-1

HDH/SMO/spb

Attachment

cc: T. Murley  
R. Conte  
J. Thoma

0636A

IE22  
11