

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION. NBR:8808230400 DOC.DATE: 88/08/15 NOTARIZED: NO DOCKET #  
 FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244  
 AUTH.NAME AUTHOR AFFILIATION  
 BACKUS,W.H. Rochester Gas & Electric Corp.  
 MECREDY,R.C.  
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-006-00:on 880716,electrical fault in main electrical  
 substation caused loss of normal offsite power.W/880815 ltr.  
 W/8 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 11  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:License Exp date in accordance with 10CFR2,2.109(9/19/72). 05000244

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	ACRS WYLIE	1 1	AEOD/DOA	1 1
	AEOD/DSP/NAS	1 1	AEOD/DSP/ROAB	2 2
	AEOD/DSP/TPAB	1 1	ARM/DCTS/DAB	1 1
	DEDRO	1 1	NRR/DEST/ADS 7E	1 0
	NRR/DEST/CEB 8H	1 1	NRR/DEST/ESB 8D	1 1
	NRR/DEST/ICSB 7	1 1	NRR/DEST/MEB 9H	1 1
	NRR/DEST/MTB 9H	1 1	NRR/DEST/PSB 8D	1 1
	NRR/DEST/RSB 8E	1 1	NRR/DEST/SGB 8D	1 1
	NRR/DLPQ/HFB 10	1 1	NRR/DLPQ/QAB 10	1 1
	NRR/DOEA/EAB 11	1 1	NRR/DREP/RAB 10	1 1
	NRR/DREP/RPB 10	2 2	NRR/DRIS/SIB 9A	1 1
	NUDOCS-ABSTRACT	1 1	<u>REG FILE</u> 02	1 1
	RES TELFORD, J	1 1	RES/DSIR DEPY	1 1
	RES/DSIR/EIB	1 1	RGN1 FILE 01	1 1
EXTERNAL:	EG&G WILLIAMS, S	4 4	FORD BLDG HOY, A	1 1
	H ST LOBBY WARD	1 1	LPDR	1 1
	NRC PDR	1 1	NSIC HARRIS, J	1 1
	NSIC MAYS, G	1 1		

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1) <b>R.E. Ginna Nuclear Power Plant</b>															DOCKET NUMBER (2) <b>0 5 0 0 0 2 4 4</b>					PAGE (3) <b>1 OF 10</b>									
TITLE (4) <b>Loss of Offsite Power Due To a Main Substation Fault Causes Both Emergency Diesel Generator To Automatically Start and Accept Load</b>																													
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 0 0 0				
0 7 1			6 8		8 8		8 8		0 0 6		0 0		0 8 1			5 8		8 8							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)																								
N					20.402(b)					20.405(c)					<input checked="" type="checkbox"/> 60.73(a)(2)(i)					73.71(b)									
POWER LEVEL (10)					1 0 0					20.406(a)(1)(i)					60.38(e)(1)					60.73(a)(2)(i)					73.71(c)				
					20.406(a)(1)(ii)					60.38(e)(2)					60.73(a)(2)(ii)					OTHER (Specify in Abstract below and in Text, NRC Form 366A)									
					20.406(a)(1)(iii)					60.73(a)(2)(iii)					60.73(a)(2)(iii)(A)														
					20.406(a)(1)(iv)					60.73(a)(2)(iv)					60.73(a)(2)(iv)(B)														
					20.406(a)(1)(v)					60.73(a)(2)(v)					60.73(a)(2)(v)														
LICENSEE CONTACT FOR THIS LER (12)																													
NAME															TELEPHONE NUMBER														
Wesley H. Backus															AREA CODE					3 1 5									
Technical Assistant to the Operations Manager															5 2 4 1 - 4 4 4 6														
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	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC															
C	F	K	S	W	G	R	A	1	8	0	N																		
X	F	K	I	N	S	O	0	3	0	N																			
SUPPLEMENTAL REPORT EXPECTED (14)																													
YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO					EXPECTED SUBMISSION DATE (16)														
															MONTH DAY YEAR														
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (18)																													
<p>On July 16, 1988 at 1355 EDST with the reactor at approximately 100% full power an electrical fault in the plant's main electrical substation caused the loss of normal offsite power including all four (4) safeguards buses.</p> <p>The plant's two emergency diesel generators started immediately and supplied electrical power to all safeguards buses.</p> <p>The underlying cause of the event was due to a failed bushing on one (1) of the plant's main electrical substation 115 KV oil circuit breakers.</p> <p>Immediate corrective action was to stabilize the plant in accordance with abnormal operating procedure for loss of offsite power.</p> <p>Action taken or planned to prevent recurrence was to replace the failed bushing and to send the failed bushing to the Lapp Insulator Co. for failure mechanism determination.</p>																													

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104  
EXPIRES 8/31/85

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R.E. Ginna Nuclear Power Plant

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

I. PRE-EVENT PLANT CONDITIONS

The unit was at approximately 100% steady state full power with no major activities in progress.

II. DESCRIPTION OF EVENT

## A. DATES AND APPROXIMATE TIMES FOR MAJOR OCCURRENCES:

- . July 16, 1988, 1355 EDST: Event date and time
- . July 16, 1988, 1355 EDST: Discovery date and time
- . July 16, 1988, 1409 EDST: Unusual Event declared
- . July 16, 1988, 1500 EDST: Offsite power restored via 34.5 KV circuit 751
- . July 16, 1988, 1539 EDST: Turbine generator taken off the line
- . July 16, 1988, 1621 EDST: Reactor trip breakers opened
- . July 16, 1988, 1645 EDST: Unusual Event terminated
- . July 16, 1988, 1740 EDST: Safeguard buses energized by offsite power source
- . July 16, 1988, 1740 EDST: "A" and "B" Emergency Diesel Generators were stopped and aligned for automatic standby

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

## B. EVENT:

On July 16, 1988 at 1355 EDST with the reactor at approximately 100% full power an electrical fault in the plant's main electrical substation caused five main breakers in the substation to trip open. These five main breakers opening caused the loss of approximately one half of the transmission capability of the substation plus caused the loss of normal offsite power to the plant (i.e. 34.5 KV circuit 767). The plant's four (4) safeguards buses de-energized and were re-energized with the plant's two (2) emergency diesel generators in approximately 30 seconds as designed. Control Room operators performed the actions of Abnormal Procedure AP-ELEC.1 (Loss of #12 SS Transformer) to stabilize the plant in response to the loss of offsite power.

With the momentary loss of the plant safeguards buses, one instrument bus was momentarily lost causing a turbine runback. The Control Room operators performed the actions of Abnormal Procedure AP-TURB.2 (Automatic Turbine Runback) and stabilized the plant at approximately 75% power.

Subsequently at 1400 EDST, the Security Department reported to the Control Room that they heard an explosion at the main electrical substation. This led the Operations Shift Supervisor to declare an Unusual Event at 1409 EDST in accordance with plant procedure SC-100, "Ginna Station Event Evaluation and Classification", Emergency Action Level: Hazards Being Experienced or Projected; Explosion Near or Onsite Reported to Operations Personnel. All offsite notifications were made per plant procedure SC-601, "Unusual Event Notification".

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Following the Unusual Event declaration, a plant shutdown was commenced at the request of the power control dispatcher due to the damage to the offsite power transmission equipment. At approximately 1500 EDST, offsite power was restored to the station via 34.5 KV circuit 751.

At 1539 EDST the turbine generator was taken off the line and at 1621 EDST the reactor trip breakers were opened and the plant was stabilized in hot shutdown.

Subsequently at 1645 EDST the Operations Shift Supervisor, with approval and concurrence from the Superintendent of Ginna Station, the Operations Supervisor, and the Duty Engineer, declared the Unusual Event terminated in accordance with plant procedure SC-110, "Ginna Station Event Evaluation for Reducing the Classification". The rationale involved in the termination was:

- . The cause of the explosion was known (i.e. a bushing on circuit breaker 91102 had failed internally and expelled byproducts of the fault in the vicinity of the power factor test tap).
- . The failed circuit breaker had been electrically isolated.
- . There was no longer a danger of fire at the main electrical substation.
- . The reactor was stable at hot shutdown.
- . Offsite power had been restored.

At approximately 1740 EDST all four (4) safeguards buses were energized by the offsite power source and the "A" and "B" emergency diesel generators were stopped and realigned for automatic standby.

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

Noteworthy equipment and operational problems encountered during the event were as follows:

- . After the turbine generator was off line, the Control Room operator attempting to reset feedwater isolation on the "B" Steam Generator (S/G) inadvertently depressed the "B" S/G steamline isolation reset pushbutton. The "B" S/G main steam isolation valve closed. It was reopened approximately two (2) minutes later.
- . Rod position indication, indicated Control rod L-6 in controlling bank "A" failed to insert while the Control Room operator was driving Control rods in per step 5.35.2 of plant procedure O-2.1 (Normal Shutdown to Hot Shutdown). Rod position indication, indicated Control rod L-6 did insert when the reactor trip breakers were opened per step 5.35.5 of plant procedure O-2.1.
- . During subsequent investigation of the main electrical substation an oil leak was discovered at the substation on the 115 KV underground line from the plant to the substation.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None.

E. METHOD OF DISCOVERY:

The event was immediately apparent due to alarms and indication in the Control Room.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

## F. OPERATOR ACTION:

Following the loss of offsite power and automatic initiation of the Emergency Diesel Generators the Control Room operators performed the actions of Abnormal Procedure AP-ELEC.1 (Loss of #12 SS Transformer) to stabilize the plant in response to the loss of offsite power.

## III. CAUSE OF EVENT

## A. IMMEDIATE CAUSE:

The automatic initiation of the Emergency Diesel Generators was due to the loss of offsite power.

## B. INTERMEDIATE CAUSE:

The loss of offsite power was due to the loss of 34.5 KV circuit 767. This circuit was lost due to the partial loss of the plant's main electrical substation.

## C. ROOT CAUSE:

The partial loss of the plant's main electrical substation was due to a failed bushing on 115 KV circuit breaker 91102 that tripped open other 115 KV breakers in the substation to isolate the fault.

## IV. ANALYSIS OF EVENT

This event is reportable in accordance with 10 CFR 50.73, Licensee Event Report System, item (a)(2)(iv) which requires reporting of, "any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS)". The starting of the Emergency Diesel Generators in response to loss of offsite power was an automatic actuation of the ESF.

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

An assessment was performed considering both the safety consequences and implications of this event with the following results and conclusions:

There were no safety consequences attributed to the loss of offsite power and subsequent Emergency Diesel Generator operation because;

- The two Emergency Diesel Generators started, tied into their respective safeguards buses and accepted load as designed.
- The two Emergency Diesel Generators operated throughout the event without incident.
- A backup offsite power source was available upon demand.
- The plant was stabilized quickly after the loss of offsite power with all required equipment operable or operating.

There were no safety implications attributed to the loss of offsite power and subsequent Emergency Diesel Generator operation because:

Even if the event had occurred under a more severe set of initial conditions, (i.e. loss of offsite power coincident with reactor trip/turbine trip causing loss of all the 4160 main motors), the plant is designed to achieve hot shutdown and maintain core cooling and decay heat removal via the Emergency Diesel Generators. Chapter 15 of the Ginna Station UFSAR describes the following, assuming a unit trip with loss of offsite AC power;

- Plant vital instruments are supplied by the emergency power sources.



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TEXT (If more space is required, use additional NRC Form 365A's) (17)

- As the steam system pressure subsequently increases, the steam system power relief valves are automatically opened to the atmosphere. Steam bypass to the condenser is not available because of loss of the circulating water pumps.
- As the steam flow rate through the power relief valves may not be sufficient, the steam generator self-actuated safety valves may temporarily lift to augment the steam flow until the rate of heat dissipation is sufficient to carry away the sensible heat of the fuel and coolant above no-load temperature plus the residual heat produced in the reactor.
- As the no-load temperature is reached, the steam system power-operated relief valves are used to dissipate the residual heat and to maintain the plant at the hot shutdown condition.
- The loss of normal feedwater supply signals the start of the auxiliary steam turbine driven feedwater pump. The turbine utilizes steam from the secondary system to drive the feedwater pump to deliver makeup water to the steam generators. The electric-motor driven auxiliary feedwater pumps are supplied power by the diesel generators. The pumps take suction directly from the condensate storage tanks for delivery to the steam generators.
- Upon the loss of power to the reactor coolant pumps, coolant flow necessary for core cooling and the removal of residual heat is maintained by natural circulation in the reactor coolant loops.

Based on the above, it can be concluded that the public's health and safety was assured at all times.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

V. CORRECTIVE ACTION

## A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

- The normal offsite power source (i.e. 34.5 KV circuit 767) was returned to service after the affected main electrical substation breaker had been isolated.
- The oil leak that was discovered in the 115 KV underground line between the plant and the main electrical substation was repaired and tested satisfactorily.
- Control rod L-6 in controlling bank "A" was extensively investigated to determine why it did not step in with the other rods of its bank. No direct cause could be determined and control rod L-6 was tested satisfactorily to move in and out with its bank upon demand. At the present time controlling bank "A" is being tested weekly to verify operability of L-6.
- The affected main electrical substation breaker was repaired and tested satisfactorily.

## B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- The failed bushing is being sent to Lapp Insulator for determination of the failure mechanism.
- Westinghouse Electric Corporation was contacted about the problem experienced with control rod L-6. They could not determine a possible root cause but did suggest that the plant perform a complete rod control system checkout during the next refueling and maintenance outage. This rod control system checkout is presently being evaluated by the plant staff and a plant Corrective Action Report (CAR) was initiated to assure follow through on root cause evaluation.

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TEXT (If more space is required, use additional NRC Form 358A's) (17)

- The inadvertent closing of the "B" Steam Generator MSIV is a potential Human Factors concern. An evaluation will be performed to determine if Control Board Human Factors changes are warranted.

VI. ADDITIONAL INFORMATION

## A. FAILED COMPONENTS:

- The affected breaker was a "ALLIS Chalmers", type BZ0-115-10,000-2, 3000 amp, 115 KV oil circuit breaker.
- The failed bushing was a "OHIO BRASS Co." class GK-40, 3000 amp, 115 KV, BIL-550 KV electrical bushing.

## B. PREVIOUS LERs ON SIMILAR EVENTS:

A similar LER event historical search was conducted with the following results: No documentation of similar LER events with the same root cause of Ginna Station could be identified.

## C. SPECIAL COMMENTS:

None.



NEW  
YORK  
STATE

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649-0001

TELEPHONE  
AREA CODE 716 546-2700

August 15, 1988

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

Subject: LER 88-006, Loss of Offsite Power Due To A Main  
Substation Fault Causes Both Emergency Diesel Genera-  
tors to Automatically Start and Accept Load.  
-R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

In accordance with 10 CFR 50.73, Licensee Event Report  
System, item (a)(2)(iv) which requires a report of, "any event or  
condition that resulted in manual or automatic actuation of any  
Engineered Safety Feature (ESF) including the Reactor Protection  
System (RPS)", the attached Licensee Event Report LER 88-006 is  
hereby submitted.

This event has in no way affected the public's health and  
safety.

Very truly yours,

Robert C. Mecredy  
General Manager  
Nuclear Production

xc: U.S. Nuclear Regulatory Commission  
Region I  
475 Allendale Road  
King of Prussia, PA 19406

Ginna USNRC Senior Resident Inspector

IE22  
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