

ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8909060066 DOC.DATE: 89/08/28 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. Rochester Gas & Electric Corp.
 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-009-00:on 890729,failure of control rod position
 indication sys due to grounded coil stack.

W/8 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 9
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

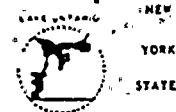
NOTES:License Exp date in accordance with 10CFR2,2.109(9/19/72). 05000244

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD1-3 LA	1 1	PD1-3 PD	1 1
	JOHNSON,A	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	ACRS WYLIE	1 1	AEOD/DOA	1 1
	AEOD/DSP/TPAB	1 1	AEOD/ROAB/DSP	2 2
	DEDRO	1 1	IRM/DCTS/DAB	1 1
	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/PEB 10	1 1
	NRR/DOEA/EAB 11	1 1	NRR/DREP/RPB 10	2 2
	NUDOCS-ABSTRACT	1 1	REG FILE 02	1 1
	RES/DSIR/EIB	1 1	RGN1 FILE 01	1 1
EXTERNAL:	EG&G WILLIAMS,S	4 4	L ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC MAYS,G	1 1	NSIC MURPHY,G.A	1 1
	NUDOCS FULL TXT	1 1		

FULL TEXT CONVERSION REQUIRED
 TOTAL NUMBER OF COPIES REQUIRED: LTTR 40 ENCL 40

A/10-4
cert

R
I
D
S
/
A
D
D
S



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

TELEPHONE
AREA CODE 716 546-2700

August 28, 1989

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

Subject: LER 89-009, Failure of Control Rod Position Indication
System Due To A Grounded Coil Stack Causes Plant
Shutdown per Technical Specifications
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

In accordance with 10 CFR 50.73, Licensee Event Report System, item (a)(2)(i)(A), which requires a report of, "the completion of any nuclear plant shutdown required by the plant's Technical Specifications", and item (a)(2)(i)(B), which requires a report of, "any operation or condition prohibited by the plant's Technical Specifications", the attached Licensee Event Report LER 89-009 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

8909060066 890828
FDR ADOLK 05000244
S FDC

IE22

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3180-0104
EXPIRES - 6/30/85

FACILITY NAME (1) R.E. Ginna Nuclear Power Plant DOCKET NUMBER (2) 050002441 OF 08

TITLE (4) Failure of Control Rod Position Indication System Due To A Grounded Coil Stack Causes Plant Shutdown per Technical Specifications

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 (3)
07	29	89	89	009	00	08	28	89			05000

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 100	20.402(b)		20.406(e)		60.736(2)(h)		73.71(b)			
	20.406(a)(1)(i)		60.36(a)(1)		60.736(2)(v)		73.71(w)			
	20.406(a)(1)(ii)		60.36(a)(2)		60.736(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 364A)			
	20.406(a)(1)(iii)		60.736(2)(i)		60.736(2)(vii)(A)					
	20.406(a)(1)(iv)		60.736(2)(ii)		60.736(2)(viii)(B)					
	20.406(a)(1)(v)		60.736(2)(iii)		60.736(2)(ix)					

LICENSEE CONTACT FOR THIS LER (12)

NAME Wesley H. Backus Telephone Number 315 521-1414
Technical Assistant to the Operations Manager

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
B	A1A	C1LW	120	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 words, i.e., approximately fifteen single-space typewritten lines) (16)

On July 29, 1989 at 1843 EDST with the reactor at approximately 100% full power the control rod position indication system was rendered inoperable due to a control rod position indication coil stack shorting to ground.

Plant shutdown to hot shutdown was commenced within one hour to comply with plant Technical Specifications on control rod position indication operability requirements. Hot shutdown was achieved and all control rods were inserted in the core and the reactor trip breakers were opened.

The faulty control rod position indication coil stack was replaced with a qualified spare, tested satisfactorily and returned to service.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/89

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	— 0 0 9	— 0 0	0 2	OF	0 8

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. The Instrument and Control (I&C) Department was troubleshooting the Microprocessor Rod Position Indication System (MRPI) per maintenance procedure M-51.14 (Microprocessor Rod Position Indication System (MRPI) Maintenance). Annunciator alarm C-29, (MRPI System Failure) had been alarming intermittently, for short durations, since 1349 EDST this day. After the MRPI alarm cleared, proper rod position indication was verified.

Periodic Test procedure PT-1 (Rod Control System) was performed at least twice during the above troubleshooting to verify that MRPI was indeed operable.

II. DESCRIPTION OF EVENT

A. DATES AND APPROXIMATE TIMES FOR MAJOR OCCURRENCES:

- o July 29, 1989, 1843 EDST: Event date and time.
- o July 29, 1989 1843 EDST: Discovery date and time.
- o July 29, 1989, 1933 EDST: Commenced plant shutdown to hot shutdown per plant Technical Specifications.
- o July 29, 1989, 2035 EDST: Operations Shift Supervisor declared an Unusual Event..
- o July 30, 1989, 0132 EDST: Reactor subcritical and the reactor trip breakers opened.
- o July 30, 1989, 0140 EDST: Unusual Event terminated.
- o August 9, 1989: Cause of MRPI failure identified and corrected.

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 (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	- 0 0 9	- 0 0	0 0	3 OF	0 8

TEXT (If more space is required, use additional NRC Form 306A's) (17)

B. EVENT:

On July 29, 1989 at 1843 EDST with the reactor at approximately 100% full power, annunciator alarm C-29, (MRPI System Failure) locked in with MRPI screen alarms, "HDLC PROTOCOL STATUS - FRAME TX/RX ERROR" due to data stream received being improperly formatted and "DATA RECEPTION STATUS - FAILED" due to valid message not being received within 400-600 milliseconds. These failures disabled both MRPI CRTs and the Plant Process Computer System (PPCS) control rod position indication thus leaving the plant without a control rod position indication system.

The plant operating without a control rod position indication system was contrary to Technical Specification 3.10.5.1 and 3.10.5.2 which states in part:

3.10.5.1 - While critical, the rod position indication system and step counters shall be operable and capable of determining the control rod position within ± 12 steps.

3.10.5.2 - With a maximum of one rod position indication per bank inoperable ...

As all rod position indication per bank was inoperable, this placed the plant into Technical Specifications Section 3.0.1 which states, "In the event a Limiting Condition for operation and/or associated action requirements cannot be satisfied because of circumstances in excess of those addressed in the specification, within 1 hour action shall be initiated to place the unit in at least hot shutdown within the next 6 hours (i.e., a total of seven hours) and in at least cold shutdown within the following 30 hours (i.e., a total of 37 hours) unless corrective measures are completed that permit operation under the permissible action statements for the specified time interval as measured from initial discovery or until the reactor is placed in a mode in which the specification is not applicable.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 8/31/93

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	- 0 0 9	- 0 0	0 4	OF	0 8

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

With the reactor subcritical, the above specification on rod position indication would not be applicable.

At 1933 EDST on July 29, 1989 an orderly shutdown to hot shutdown was commenced to comply with the plant Technical Specifications.

At approximately 2035 EDST, July 29, 1989 the Operations Shift Supervisor declared an Unusual Event in accordance with SC-100, "Ginna Station Event Evaluation and Classification", emergency action level: Loss of indicators, annunciators, or alarms; Loss of indication or alarms requiring a plant shutdown. All offsite notifications were made per SC-601, "Unusual Event Notification".

At approximately 0132 EDST, July 30, 1989 with the reactor subcritical, the reactor trip breakers were opened with all control rods inserted, thus placing the plant operation within the plant Technical Specifications.

Because the control rod position indication system is only required by the plant Technical Specifications when the reactor is critical, the Operations Shift Supervisor with approval and concurrence from the Plant Manager, the Operations Manager, and the Duty Engineer, declared the Unusual Event terminated at 0140 EDST, July 30, 1989 in accordance with SC-110, "Ginna Station Event Evaluation for Reducing the Classification". All offsite agencies were notified of the termination of the Unusual Event.

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

None.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None.

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 (3)

PAGE (4)

R.E. Ginna Nuclear Power Plant

0 5 0 0 0 2 4 4 8 9 - 0 0 9 - 0 0 0 5 OF 0 8

TEXT (If more space is required, use additional NRC Form 308A's) (17)

E. METHOD OF DISCOVERY:

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

F. OPERATOR ACTION:

Immediate operator action was to notify the I&C Department to trouble-shoot the intermittent MRPI alarms.

Subsequent operator action was to shut the plant down to hot shutdown to comply with the plant Technical Specifications.

G. SAFETY SYSTEM RESPONSES:

None.

III. CAUSE OF EVENT

A. IMMEDIATE CAUSE:

The immediate cause of the failure of the control rod position indication system was due to two alarms on the serial data link that rendered the system inoperable. These two alarms were:

1. "HDLC PROTOCOL STATUS - FRAME TX/RX ERROR", due to data stream received being improperly formatted.
2. "DATA RECEPTION STATUS - FAILED", due to a valid message not being received within 400-600 milliseconds.

B. INTERMEDIATE CAUSE:

The cause of the two alarms on the serial data link was due to control rod F-12 coil stack shorting to ground.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES 8/31/95

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	- 0 0 9	- 0 0	0 6	OF	0 8

TEXT (If more space is required, use additional NRC Form 306A's) (17)

C. ROOT CAUSE:

The underlying cause of the system failure mode was control rod F-12 coil stack shorting to ground. Further investigation for the failure mode of shorting to ground is in progress.

IV. ANALYSIS OF EVENT

The event is reportable in accordance with 10 CFR 50.73, Licensee Event Report System item (a)(2)(i)(A), which requires reporting of, "the completion of any Nuclear Plant shutdown required by the plant's Technical Specifications" and item (a)(2)(i)(B), which requires reporting of, "any operation or condition prohibited by the plant's Technical Specifications". The shutdown of the plant because of the rod position indication system failure was a completion of the shutdown of the nuclear plant required by the plant's Technical Specifications.

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

There were no operational or safety consequences attributed to the loss of all rod position indication because:

- o The event was immediately apparent.
- o The control rod bank step counters were all operable indicating the demand position of the control rods.
- o Incore flux maps were taken to verify actual rod position indication.
- o The reactor was shutdown in an orderly fashion to hot shutdown with all control rods inserted, thus terminating the need for rod position indication.

There was one implication attributed to the loss of all rod position indication at power. This implication was that if the reactor tripped from power the verification of all control rods inserted could not be done due to the MRPI failure.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/89

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

R.E. Ginna Nuclear Power Plant

0 5 0 0 0 2 4 4 8 9 - 0 0 9 - 0 0 0 7 OF 0 8

TEXT (If more space is required, use additional NRC Form 308A's) (17)

Emergency Procedures E-0 (Reactor Trip or Safety Injection) and FR-S.1 (Response to Reactor Restart/ATWS) address the concerns from the above implication. One train of trip breakers open and decreasing neutron flux toward the source ranges indicate the reactor has tripped and sufficient control rods have been inserted. Emergency boration of the reactor coolant system is established to insure adequate shutdown margin.

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

V. CORRECTIVE ACTION

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

- o After extensive troubleshooting, rod position indication coil stack F-12 was determined to be shorted to ground.
- o Rod position indication coil stack F-12 was replaced with a qualified spare, tested satisfactorily and returned to service.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- o The annunciator C-29 was modified to alarm when a single MRPI subsystem was receiving errors, instead of requiring both MRPI subsystems to initiate an alarm as before, by changing wiring per System Modification procedure SM-3797.10..
- o Coil stack and serial data troubleshooting checks were added to M-51.14 (Microprocessor Rod Position Indication System (MRPI) Maintenance).

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 (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
R.E. Ginna Nuclear Power Plant	0 5 0 0 0 2 4 4	8 9	- 0 0 9	- 0 0	0 8	OF	0 8

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

- o Methods to improve electrical diagnostic testing, are being investigated, to provide for early detection of coil stack problems.
- o Annunciator response procedure AR-C-29 has been changed to reflect SM-3797.10 change.
- o The feasibility of design changes are being reviewed, to detect or prevent single failures from rendering the system inoperable.
- o Failure mode is still under investigation.

VI. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The failed component was a detector (coil stack), model number 6098D65602, manufactured by the Westinghouse Electric Corporation.

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 at Ginna Station could be identified.

C. SPECIAL COMMENTS:

None.