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FACIL:50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
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MECREDY,R.C. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 90-018-00:on 901220,dropped control rod/turbine runback occurred during rod control exercises.Caused by degraded power bridge thyristor supporession filter capacitors. Capacitors replaced.W/910121 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Vice President
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AREA CODE 716 546-2700

January 21, 1991

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

Subject: LER 90-018, Dropped Control Rod During Rod Control Exercises Causes Automatic Actuation of RPS (i.e. Turbine Runback)
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 required s 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 90-018 is hereby submitted.

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

Very truly yours,

Robert C. Mecredy

Robert C. Mecredy

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

Ginna USNRC Senior Resident Inspector

Cert No P249194216

IE22

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NRC Form 366
(5-83)

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)
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TITLE (4) Dropped Control Rod During Rod Control Exercise Causes Automatic Actuation of RPS (i.e. Turbine Runback)

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)
1 2	2 0	9 0	9 0	0 1 8	0 0	0 1	2 1	9 1		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 2 2	20.402(b)	20.405(c)	X 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)	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
Wesley H. Backus Technical Assistant to the Operations Manager	AREA CODE 3 1 5 5 2 4 - 4 4 4 6

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
B	J G	C A P	W 1 2 0	Y					

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-spaced typewritten lines) (16)

On December 20, 1990 at 1321 EST, with the reactor at approximately 22% full power, a turbine runback occurred due to a dropped control rod.

The Control Room operators performed the appropriate actions of Abnormal Procedures AP-TURB.2 (Automatic Turbine Runback) and AP-RCC.2 (RCC/RPI Malfunction) to stabilize the plant. The Control Room operators manually tripped the turbine to prevent reverse power to the generator. Subsequently the reactor was taken subcritical to accomodate anticipated corrective maintenance activities. The Main Steam Isolation Valves were then closed to limit a plant cooldown.

The underlying cause of the event was attributed to degraded power bridge thyristor suppression filter capacitors in the circuit supplying power to the stationary, movable and lift coils of the affected control rod.

Corrective action was to replace the degraded capacitors in the power cabinet supplying power to the affected rod.

I. PRE-EVENT PLANT CONDITIONS

The reactor was at approximately 22% with the turbine generator on the line, producing approximately 80 megawatts. The following activities were in progress:

- Plant startup was continuing from the reactor trip of 12/11/90 (LER 90-013) and subsequent reactor trip of 12/12/90 (LER 90-016).

- The Instrument and Control (I&C) Department was in the process of troubleshooting a control problem with the Control Bank "D" Control Rods. (When manually stepping Bank "D" Control Rods out to control Reactor Coolant System (RCS) temperature, it was observed that the Bank "D" Control Rods stepped out to 128 steps, then stepped in 3 steps (with the rod control switch still held in the out position)). As part of this troubleshooting effort, the I&C Department requested that Periodic Test procedure PT-1 (Rod Control System) be performed.

II. DESCRIPTION OF EVENT

A. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

- December 20, 1990, 1321 EST: Event date and time.

- December 20, 1990, 1321 EST: Discovery date and time.

- December 20, 1990, 1321 EST: Control Room operators perform the appropriate actions of Abnormal Procedures AP-TURB.2 (Automatic Turbine Runback) and AP-RCC.2 (RCC/RPI Malfunction) to stabilize the plant.

- December 20, 1990, 1323 EST: Turbine tripped manually.

- o December 20, 1990, 1338 EST: Control Room operators close both Main Steam Isolation Valves (MSIVs) to terminate a RCS cooldown.

- o December 20, 1990, 1344 EST: Shutdown and control rods were fully inserted manually, and both reactor trip breakers were opened.

- o December 20, 1990, 1345 EST: Plant stabilized in hot shutdown.

B. EVENT:

On December 20, 1990, at 1321 EST, with the reactor at approximately 22% full power, a dropped control rod/turbine runback occurred. Control Bank "C" Control Rod J-10 dropped approximately thirty-eight (38) steps into the core during the performance of PT-1. The turbine runback reduced generator load from approximately 80 megawatts to approximately 15 megawatts.

The Control Room operators performed the appropriate actions of AP-TURB.2 (Automatic Turbine Runback) and AP-RCC.2 (RCC/RPI Malfunction) to stabilize the plant. Subsequently, at 1323 EST, the turbine was tripped manually to prevent reverse power to the generator. The Control Room operators then performed the appropriate actions of AP-TURB.1 (Turbine Trip Without Rx Trip Required).

At 1329 EST, with the reactor at approximately 6% full power and the "A" Main Feedwater Pump running feeding both Steam Generators (S/G) through the Main Feedwater Regulating Bypass valves, the "A" Main Feedwater Pump tripped on feed pump seal water low differential pressure. The motor driven auxiliary feedwater pumps started automatically (as designed) and reactor power was reduced to approximately 3% full power to ensure that required feedwater flow was within the capacity of the auxiliary feedwater pumps.

Due to the low power condition and to support trouble-shooting activities, the Shift Supervisor conservatively ordered the control and shutdown rods to be inserted into the core, in accordance with normal operating procedures.

Subsequently at 1338 EST the MSIVs were closed to limit the RCS cooldown. The reactor trip breakers were opened at 1344 EST and the plant was stabilized in hot shutdown.

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 indications in the Control Room.

F. OPERATOR ACTION:

Subsequent to the turbine runback, the Control Room operators performed the appropriate actions of AP-TURB.2 and AP-RCC.2 to stabilize the plant. The turbine was manually tripped to prevent reverse power to the generator. The Control Room operators then performed the appropriate actions of AP-TURB.1 and subsequently, when the main feedwater pump tripped, assured auxiliary feedwater flow to S/G, took the reactor subcritical by inserting all control and shutdown rods, and opened the reactor trip breakers. The plant was then stabilized in hot shutdown.

G. SAFETY SYSTEM RESPONSES:

None.

III. CAUSE OF EVENT

A. IMMEDIATE CAUSE:

The automatic turbine runback was caused by dropped Control Rod J-10.

B. INTERMEDIATE CAUSE:

The cause for dropped Control Rod J-10 is attributed to a noisy incoming power supply to Control Rod J-10's stationary and movable gripper coils.

The noisy incoming power supply is attributed to degraded thyristor capacitors in the power bridge circuit for the stationary, movable and lift coils. A review of Westinghouse Technical Bulletin (NSD-TB-74-16), was performed, and the power bridge circuitry was analyzed, supporting this conclusion.

C. ROOT CAUSE:

The underlying cause of the degraded thyristor capacitors is attributed to decreased service life due to elevated operating temperatures for the capacitors.

IV. ANALYSIS OF EVENT

The 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)", in that the automatic turbine runback from the dropped rod was an automatic actuation of the RPS.

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

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

- Power was reduced automatically to compensate for the negative reactivity of the dropped rod.

- All reactor control and protection systems performed as designed thus limiting the overall effects of the transient.

The transient was compared to the dropped rod event evaluated in Section 15 of the Ginna Updated Final Safety Analysis (UFSAR). No assumptions specified in Chapter 15 of the UFSAR were violated during this event.

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:

- The control problem with the undesired stepping of Bank "D" control rods was caused by previously installed test equipment. This equipment was removed and the rod control system was tested and verified to be operating properly.

- The electricians measured the resistance of control rod J-10's stationary, movable and lift coils, and verified the resistance was correct for hot shutdown conditions. Meggering verified no grounds existed.

- The I&C Department checked coil polarity and verified there were no blown fuses. These activities confirmed that conditions which normally cause dropped rods, within the industry, did not exist for this event.

- To correct the cause of dropped rod J-10, the I&C Department replaced the power bridge thyristor suppression filter capacitors in the circuit supplying power to the stationary, movable and lift coils of Control Rod J-10.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

As the underlying cause of the event was attributed to premature aging of the thyristor capacitors, the following actions are being planned:

- All power bridge thyristor capacitors in Power Cabinet 1 AC were replaced. (Control Rod J-10 is powered from this cabinet).
- All power bridge thyristor capacitors in the other power cabinets (feeding the stationary, movable and lift coils of all control rods) will be replaced during the next annual outage.
- The need to set up a program for the periodic replacement of these thyristor capacitors, based on their time in service, will be evaluated.

VI. ADDITIONAL INFORMATION

A. FAILED COMPONENTS:

The thyristor capacitors involved were purchased from Westinghouse Electric Corporation, part number 2383A34H01 (capacitor, .5 ufd, 660 VAC). These capacitors had been previously installed as a sub-component of Field Change Kit, drawing No. 2379A94.

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. However, LER 89-008 was a similar event with no known root cause.

C. SPECIAL COMMENTS:

None.