



Commonwealth Edison
LaSalle County Nuclear Station
2601 N. 21st. Rd.
Marseilles, Illinois 61341
Telephone 815/357-6761

March 25, 1993

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #93-002-00, Docket #050-374 is being submitted to your office in accordance with 10CFR50.73(a)(2)(v).

G. F. Spedl
Station Manager
LaSalle County Station

GFS/MT/mk1

Enclosure

xc: Nuclear Licensing Administrator
NRC Resident Inspector
NRC Region III Administrator
INPO - Records Center
IDNS Resident Inspector

090030
9303290157 930325
PDR ADOCK 05000374
S PDR

IE22
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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1) LaSalle County Station Unit 2 Docket Number (2) 0 5 10 10 10 13 17 14 Page (3) 1 of 0 4
 Title (4)

Insufficient Flow of the Reactor Core Isolation Cooling System During Quarterly Surveillance

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	2	2	9	3	9	3	0	3	2	5	9	3	0	5	10	10	10	13	17	14
OPERATING MODE (9)			1			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)														
POWER LEVEL (10)			1			20.402(b)			20.405(c)											
						20.405(a)(1)(i)			50.36(c)(1)											
						20.405(a)(1)(ii)			50.36(c)(2)											
						20.405(a)(1)(iii)			50.73(a)(2)(i)											
						20.405(a)(1)(iv)			50.73(a)(2)(ii)											
						20.405(a)(1)(v)			50.73(a)(2)(iii)											
									50.73(a)(2)(iv)											
									50.73(a)(2)(v)											
									50.73(a)(2)(vi)											
									50.73(a)(2)(vii)											
									50.73(a)(2)(viii)(A)											
									50.73(a)(2)(viii)(B)											
									50.73(a)(2)(ix)											
									73.71(b)											
									73.71(c)											
									Other (Specify in Abstract below and in Text)											

LICENSEE CONTACT FOR THIS LER (12)

Name: Michael Tennyson, System Engineer Ext. 2421
 TELEPHONE NUMBER: AREA CODE 8 1 5 3 5 17 1 - 6 17 16 11

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
X	B	N	S	C	W	2	9	10	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-space typewritten lines) (16)

On February 23, 1993 Unit 2 was in Operational Condition 1 (Run) at 100% power. At 1625 hours the Reactor Core Isolation Cooling (RCIC) System Turbine was started in accordance with LOS-RI-Q5, "Reactor Core Isolation Cooling System Pump Operability, Valve In Service Tests in Conditions 1, 2, & 3, and Cold Quick Start". Following a successful system startup, pump flow increased to 500 gpm and turbine speed to 3300 rpm, at 665 psig discharge pressure. The required system flow of 600 gpm could not be obtained. The system was declared inoperable and entered into the Degraded Equipment Log on February 23, 1993 at 2220 hours. The cause of the degraded flow and speed was attributed to an inoperable RCIC Turbine Control Box.

At the time the High Pressure Core Spray (HPCS) System and the other Emergency Core Cooling Systems (ECCS) were fully operable. The RCIC System was immediately declared inoperable. There were no adverse consequences due to this event.

The RCIC Turbine Control Box was replaced and LaSalle Special Test LST-92-185, "RCIC Control Calibration Test" was performed satisfactory. The RCIC System was restarted on February 24, 1993 per LaSalle Operating Procedure LOP-RI-06, "Controlled Start of the Reactor Core Isolation Cooling System in the CST Test Mode" to verify proper operation of the turbine controls.

The system was later tested successfully per LOS-RI-Q5. The RCIC system was returned to service on February 25, 1993 at 0245 hours.

This event is reported to the Nuclear Regulatory Commission as a Licensee Event Report in accordance with 10CFR50.73(a)(2)(v) due to RCIC being declared inoperable (loss of a safety system function).

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FACILITY NAME (1)			DOCKET NUMBER (2)			LER NUMBER (6)						Page (3)												
						Year	///	Sequential Number	///	Revision Number														
LaSalle County Station Unit 2			0	5	0	0	0	3	7	4	9	3	-	0	0	2	-	0	0	0	2	OF	0	4

TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. CONDITION PRIOR TO EVENT

Unit(s): 2 Event Date: 2/23/93 Event Time: 1625 Hours
 Reactor Mode(s): 1 Mode(s) Name: Run Power Level(s): 100%

B. DESCRIPTION OF EVENT

On February 23, 1993 Unit 2 was in Operational Condition 1 (Run), at 100% power. At 1625 hours the Reactor Core Isolation Cooling (RCIC, RI) [BN] System was started in accordance with LaSalle Operating Surveillance LOS-RI-Q5 "Reactor Core Isolation Cooling System Pump Operability, Valve In Service Tests in Conditions 1, 2, & 3, and Cold Quick Start". Following a successful system startup, pump flow increased to 500 gpm and turbine speed increased to 3300 rpm at 665 psig discharge pressure. The required system flow of 600 gpm could not be obtained.

During a "cold" quick start the RCIC Flow Controller 2E51-R600 was verified in the Automatic Mode and set at 600 GPM. The Full Flow Test Return Upstream Stop 2E51-F022 was fully opened and system startup was accomplished by simultaneously opening the RCIC Steam Supply Stop 2E51-F045 and the Full Flow Test Return Downstream Stop 2E51-F059. The RCIC System flow is required to increase to 600 gpm within 30 seconds. RCIC System flow only increased to 500 gpm. The system was declared inoperable and entered into the Degraded Equipment Log (DEL 110-92-2-22) on February 23, 1993 at 2220 hours. System Engineering and the Instrument Maintenance Department were notified.

This event is reported to the Nuclear Regulatory Commission as a Licensee Event Report in accordance with 10CFR50.73(a)(2)(v) due to RCIC being declared inoperable (loss of a safety system function).

C. APPARENT CAUSE OF EVENT

The cause for pump flow of 500 gpm and turbine speed at 3300 rpm was attributed to an inoperable Turbine Control Box.

Following the system startup and discovery of the inadequate pump flow and turbine speed, the Instrument Maintenance Department checked the voltage going to the RCIC Turbine Control Box from the RCIC Pump Discharge Flow Controller 2E51-R600. The voltage output from the Flow Controller to the RCIC Turbine Control Box was 4.9 volts. The Flow Controller outputs between one and five volts depending upon the desired flow. A five volt output to the RCIC Turbine Control Box is equivalent to the maximum flow from the RCIC System. The 4.9 volts output was indicating that the Pump output flow should be approximately 600 gpm. The voltage signal from the Flow Controller to the RCIC Ramp Generator Signal Converter (RGSC) terminal points #5 and #10, was 3.95 volts. The null voltage was at -1.3 volts. The null voltage was operating properly, however 3.95 volts at the Ramp Generator was not correct.

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LaSalle County Station Unit 2			0	5	0	0	0	3	7	4	9	3	-	0	0	2	-	0	0	0	3	OF	0	4
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C. APPARENT CAUSE OF EVENT CONTINUED

The RCIC System Flow Controller was moved from its automatic mode to the manual mode. The voltage output at the turbine was still at 3.95 volts. A system shutdown was started. During the system shutdown, the controller was lowered from 100 percent (equivalent to 4200 rpm) to 20 percent (2100 rpm). The turbine speed changed as the Flow Controller was lowered below 67 percent. The Turbine speed of 2100 rpm was obtained with the Flow Controller at 33 percent. The system was tripped at the 33 percent controller output.

The troubleshooting continued at the local RCIC Turbine Controls. The leads from the Flow Controller to the Ramp Generator were lifted from the Ramp Generator and the voltage at the cables measured 4.1 volts.

The negative voltage leads from the Flow Controller, the Actuator, the Startrec Recorder Isolator, and the RCIC Turbine Control Box are connected to a common point known as the Isolated Signal Common. The leads connected to the Isolated Signal Common were lifted individually from the Isolated Signal Common and voltage measurements were obtained.

The voltage at the Flow Controller leads to the Ramp Generator changed to 4.8 volts as the lead was lifted away from the Isolated Signal Common. The lead was relanded to the Isolated Signal Common and the voltage returned to 3.95 volts. As the lead to the Turbine Control Box was lifted, the voltage at the Flow Controller returned to 4.8 volts. At this point it was determined the Turbine Control Box was loading the control circuit and hence degrading Turbine speed and Pump flow.

Resistance values were measured at the leads connected to the Actuator, the Overspeed Test Potentiometer, and the Startrec Recorder Isolator. These values appeared normal. LaSalle Special Test LST-92-185 "RCIC Control Calibration Test" was performed next to determine the exact problem with the Turbine Control Box.

The voltage input to the Turbine Control Box is normally +24 VDC at terminal point #1 and -24 VDC at terminal point #2. The voltage was measured at +25 VDC at terminal point #1 and -21 VDC at terminal point #2. The supply voltage to the Ramp Generator Terminal Point #1 was measured at +13 VDC and at terminal point #2, -13 VDC. The normal voltage is +18 VDC and -18 VDC.

The special test was stopped due to the degraded voltages into the Turbine Control Box.

The cause for the low turbine speed and pump flow was a inoperable Turbine Control Box.

D. SAFETY ANALYSIS OF EVENT

The RCIC System is designed for pumping 600 gpm to the Reactor Vessel. During the performance of LOS-RI-Q5, the system was found discharging approximately 500 gpm at a turbine speed of 3300 rpm. The degraded operation of the RCIC System during the surveillance did not compromise the operation of the unit or affect plant safety.

At the time of this incident the HPCS System and the other ECCS were fully operable. The RCIC System was immediately declared inoperable. There were no adverse consequences to this event.

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		Year	///	Sequential Number	///	Revision Number			
LaSalle County Station Unit 2	0 5 0 0 0 3 7 4	9 3	-	0 0 2	-	0 0	0 4	OF	0 4

TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]

E. CORRECTIVE ACTIONS

The RCIC System was declared inoperable on February 23, 1993, at 1625 hours and entered in the Degraded Equipment Log. Work Request # L21599 was written to investigate and repair the problem. The Instrument Maintenance Department along with System Engineering measured voltages and resistances between the RCIC Flow Controller and the RCIC Turbine Control Box in order to determine the cause of the problem. The RCIC Turbine Control Box was found degraded.

The voltage from the Power Supply Leads and from the Flow Controller Leads to the Ramp Generator were tested satisfactorily. The RCIC Turbine Control Box was replaced, and after all the leads were relanded, the voltage levels were verified acceptable.

The voltage at terminal points #1 and #2 of the Turbine Control Box, at terminal points #1 and #2 of the Ramp Generator, and at the Isolated Signal Common were measured and found satisfactory. The Flow Controller demand output voltages at 100 percent and 0 percent were also verified satisfactory.

The Turbine Control System was recalibrated successfully with the replaced Turbine Control Box in accordance with LST-92-185 "RCIC Control Calibration Test" and the RCIC System was restarted on February 24, 1993.

A slow, controlled start was performed per LaSalle Operating Procedure, LOP-RI-06, "Controlled Start of the Reactor Core Isolation Cooling System in the CST Test Mode", to verify proper operation of the Turbine Control System. The test was satisfactory.

The system was restarted per LOS-RI-Q5, and during the surveillance, Turbine speed was found to be approximately 3900 RPM locally at the turbine and 4400 RPM at the Control Room Turbine speed Indicator, 2E51-R801. The system was shutdown, the Tachometer was calibrated using LST-92-185, and the RCIC System surveillance was restarted. LOS-RI-Q5 was completed successfully, the RCIC System was returned to service and declared operable on February 25, 1993 at 0245 hours.

The Turbine Control Box will be returned to Woodward Governor Company for failure analysis. Action Item Record (AIR) 374-180-93-00801 will track completion of the failure analysis.

F. PREVIOUS EVENTS

None.

G. COMPONENT FAILURE DATA

MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MFG PART NUMBER
Woodward Governor	EG-M Control	9903-085	82710230

EVENT SUMMARY AND CAUSE CODES

DVR Number
OL-2-93-008

<input type="checkbox"/> Lost generation	<input type="checkbox"/> Reactor trip	<input type="checkbox"/> NRC violation, level
<input type="checkbox"/> Cost > \$15,000	<input type="checkbox"/> ESF actuation	<input type="checkbox"/> GSEP event, class
<input type="checkbox"/> Hazard or Spill	<input type="checkbox"/> NRC reportable	<input type="checkbox"/> Tech Spec LCO
<input type="checkbox"/> Personnel injury	<input checked="" type="checkbox"/> LER	<input type="checkbox"/> Potential or future LCO
<input type="checkbox"/> Component	<input type="checkbox"/> PSR	<input type="checkbox"/> SALP functional area
type	Failure mode	

Department	
CE	MI

Licensed? L or blank	Type	Level	Department	Detail code
A				
A				
A				

Type	Detail Code	Department
B		
B		
B		
B		

Type	Detail code
C	

Type of deficiency	Detail code	Procedure type
D		
D		
D		

Type	Detail code	Department
E		
E		
E		