NRC Form 366
(9-83)

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)
Clinton Power Station	0 5 0 0 0 4 6 1	1 OF 0 4

TITLE (4) Failure of Reactor Water Cleanup (RWCU) Isolation Bypass Switch During Channel Functional Test Results in RWCU System Isolation

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)
									None	0 5 0 0 0
0 8	1 1	8 8	8 8	0 2 1	0 0	0 9	1 1	8 8		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 8 5	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
T. J. Camilleri, Assistant Manager-Plant Maintenance X3204	AREA CODE 2 1 7 9 3 5 - 8 8 8 1

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	I J	H S	G 0 8 3	N							

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)

ABSTRACT

On August 11, 1988 with the plant in Mode 1 (POWER OPERATION), a Reactor Water Cleanup System (RWCU) high differential flow signal caused the Division II RWCU containment isolation valves to close, isolating the RWCU system. At the time of the event, RWCU flow channel functional testing was in progress. As required by the surveillance procedure, the Division II RWCU isolation bypass switch was placed in the bypass position to prevent isolations from occurring when test signals were inserted into the trip units. When a simulated trip signal was inserted into the trip unit, the signal did not bypass as designed but caused the valves to close. The root cause of this event is attributed to failure of the bypass switch. This failure is considered to be an isolated occurrence. The bypass switch was replaced, and during the functional testing of the circuit, another simulated trip signal failed to bypass. Illinois Power believes that this second failure was caused by an anomaly in the conduct of the test. Corrective action includes returning the bypass switch to the manufacturer for analysis to confirm that the switch failure was an isolated occurrence and performing additional troubleshooting of the circuit in an attempt to identify other possible causes for the second failure.

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DESCRIPTION OF EVENT

On August 11, 1988 at approximately 1850 hours, with the plant in Mode 1 (POWER OPERATION), at 85% reactor [RCT] power, a Reactor Water Cleanup [CE] System (RWCU) high differential flow signal caused the Division II RWCU containment isolation valves [ISV] to close.

On August 11, 1988, at approximately 1822 hours, Control and Instrumentation (C&I) technicians began Surveillance 9532.20, "RWCU Flow E31-N075/076/077B Channel Functional Test". In accordance with the surveillance procedure, the Division II RWCU isolation bypass switch [HS], E31-S1B, was placed in the bypass position. Prior to proceeding with the surveillance, the switch was independently verified to be in "bypass". E31-S1B is placed in "bypass" during the performance of the surveillance to prevent isolations from occurring when test signals are inserted into the trip units.

At approximately 1850 hours, a simulator was used to provide a high differential flow signal to the trip unit. An isolation signal occurred as expected; however, the Division II RWCU system isolation valves closed and isolated the RWCU system. These valves should not have closed while E31-S1B was in the bypass position. When this occurred, the RWCU pumps tripped because of the resulting low flow condition. As a result of the isolation, the surveillance was immediately terminated. The bypass switch was again verified to be in the bypass position.

At 1858 hours, Operators satisfactorily completed the Automatic Isolation Checklist.

At 1902 hours, the bypass switch was returned to the normal position but the RWCU system was left isolated pending determination and correction of the cause of the isolation.

At 1925 hours, Maintenance Work Request (MWR) C53852 was initiated to determine and correct the cause of the isolation of the RWCU system. At approximately 0100 hours on August 12, 1988, troubleshooting of the circuitry associated with E31-S1B was completed. This troubleshooting identified high resistance (130 ohms) across the bypass switch contacts which perform the circuit bypass function. This high resistance condition was an indication of a faulty switch.

E31-S1B also contains contacts which provide alarm [ALM] annunciation. During the surveillance, the alarms functioned properly. A check of the switch alarm contacts verified that they were operating properly.

The faulty bypass switch was removed from the system. A replacement switch was obtained. The contacts of the replacement switch were tested for resistance and found acceptable. The replacement switch was then installed and a functional test of the circuit was performed in accordance with MWR C53852 using applicable portions of surveillance procedure 9532.20. When the trip signal was reinserted into the trip unit, the signal again did not bypass.

An investigation of the circuitry was conducted in an attempt to identify possible causes for this second failure. The bypass circuit was subsequently operated several times while troubleshooting and no additional bypass failures occurred. No cause could be identified for the failure that occurred after the replacement switch was installed.

At approximately 2240 hours, on August 12, with one RWCU containment isolation valve open, applicable portions of surveillance 9532.20 were reperformed. The trip signal was inserted while the switch was in bypass and this time, the valve remained open. This test was considered satisfactory.

The RWCU system was returned to service at approximately 1330 hours on August 13, 1988.

No other automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other equipment or components were inoperable at the start of this event such that their inoperable condition contributed to this event.

CAUSE OF EVENT

The root cause of this event is attributed to failure of the bypass switch. This failure is considered to be an isolated occurrence. A review of Clinton Power Station equipment history determined that a trend of failures of this type of switch has not been experienced. To confirm that this failure was an isolated occurrence, the switch has been returned to the manufacturer for analysis.

After the replacement switch was installed, another simulated trip signal failed to bypass, during the functional test of the Division II circuit. Illinois Power believes that this failure was caused by an anomaly in the conduct of the test. Due to the uncertainty of the cause of this failure, an action plan has been developed to continue troubleshooting the circuit in an attempt to identify other possible causes.

CORRECTIVE ACTION

The faulty bypass switch was replaced with a new switch.

IP has returned the faulty bypass switch to the manufacturer, General Electric Company, for analysis to confirm that the switch failure was an isolated occurrence.

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

Due to the uncertainty of the exact cause for the failure of the trip signal to bypass after the replacement switch was installed, IP has developed an action plan to continue troubleshooting the circuit in an attempt to identify other possible causes.

IP will submit a supplemental report following review of the manufacturer's analysis and completion of troubleshooting if the results of these activities significantly change the information provided in this report.

ANALYSIS OF EVENT

This event is reportable under the provisions of 10CFR50.73(a)(2)(iv) due to an automatic actuation of an Engineered Safety Feature.

The RWCU system was out of service from 1850 hours on August 11 until approximately 1330 hours on August 13, 1988.

Assessment of the safety consequences and implications of this event indicates that this event was not safety significant for existing plant conditions or other plant modes or power levels. During this event, the RWCU system responded as designed to the high differential flow signal by closing the appropriate containment isolation valves and tripping the RWCU pumps. Because a short duration loss of cleanup capabilities does not affect safety, the isolation of the RWCU system does not cause the loss of any plant safety features and does not represent a condition adverse to plant safety. During this event reactor water chemistry met Technical Specification requirements.

ADDITIONAL INFORMATION

The faulty bypass switch was a type CR2940 manufactured by General Electric Company.

No previous containment isolations have occurred as a result of the same root cause.

For further information regarding this event, contact T. J. Camilleri, Assistant Manager - Plant Maintenance at (217) 935-8881, extension 3204.

U- 601270
L45-88(09-11)-LP
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ILLINOIS POWER COMPANY

CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

September 11, 1988

10CFR50.73

Docket No. 50-461

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

Subject: Clinton Power Station - Unit 1
Licensee Event Report No. 88-021-00

Dear Sir:

Please find enclosed Licensee Event Report No. 88-021-00: Failure of Reactor Water Cleanup (RWCU) Isolation Bypass Switch During Channel Functional Test Results in RWCU System Isolation. This report is being submitted in accordance with the requirements of 10CFR50.73.

Sincerely yours,

D. L. Holtzscher
Acting Manager - Licensing and
Safety

RSF/ckc

Enclosure

cc: NRC Resident Office
NRC Region III, Regional Administrator
INPO Records Center
Illinois Department of Nuclear Safety
NRC Clinton Licensing Project Manager

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