Commonwealth Edison
Braidwood Nuclear Power Station
Route #1, Box 84
Braceville, Illinois 60407
Telephone 815/458-2801

DCD

May 16, 1990
BW/90-0525

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

Dear Sir:

The enclosed Licensee Event Report from Braidwood Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(v) which requires a 30-day written report.

This report is number 90-004-00; Docket No. 50-457.

Very truly yours,

R. E. Querio
Station Manager
Braidwood Nuclear Station

REQ/JDW/jfe
(7126z)

Enclosure: Licensee Event Report No. 90-004-00

cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
CECo Distribution List

IE22

MAY 21 1990

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Braidwood 2	0 5 0 0 0 4 5 7	1 of 0 3

Title (4)

2A Diesel Generator Speed Oscillations due to a Defective Resistor.

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 4	1 6	9 0	9 0	0 0 4	0 0	0 5	1 4	9 0	None	0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	X 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)
		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
	AREA CODE
Jim Grzemski, Tech Staff Eng. Ext. 2482	8 1 5 4 5 8 - 2 8 0 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	E K	E C	W 2 9 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-space typewritten lines) (16)

At 0315 on April 16, 1990 the 2A Diesel Generator (DG) was started to perform a four hour warm up run. The DG started normally and achieved rated speed of 600 RPM. Shortly after startup the DG speed began oscillating between 300 and 600 RPM. The 2A DG was immediately shut down. At 0913 it was identified that the cause of the speed oscillations was a failure of one of the dropping resistors in the Governor Unit. The resistor was replaced. This resistor had failed on the 1B DG several weeks earlier. Byron Station, which has four DGs that are identical to Braidwood DGs, had experienced a failure of this resistor also. At 1607 the 2A DG was started for a maintenance test, DG speed remained constant at 600 RPM. At 1653 the 2A DG was started for its monthly operability run. The DG had successfully completed the test. DG speed had remained constant at 600 RPM. At 2118 the 2A DG was declared operable. The root cause of the event was component failure. The resistor in the governor power-dropping resistor board failed creating an open circuit. An evaluation of the failure mode of the resistor was conducted. It has been concluded that the cause was simple long term heat fatigue. The resistors have been replaced on all DGs at the station, and placed on a three year replacement frequency. The resistor is being evaluated for 10CFR part 21 applicability.

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: Braidwood 2; Event Date: 04/16/90; Event Time: 0315;

Mode: 6 - Refueling; Rx Power: 0%;

RCS [AB] Temperature/Pressure: Ambient/Atmospheric

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of the event which contributed to the severity of the event.

At 0315 on April 16, 1990 the 2A Diesel Generator (DG) [EK] was started to perform a four hour warm up run in preparation for its scheduled 18 month maintenance inspection. The 2A DG started normally and achieved rated speed of 600 RPM and normal voltage of about 4.16 KV. Shortly after startup the 2A DG speed began oscillating between 300 and 600 RPM. The 2A DG was immediately shut down.

At 0913 it was identified that the cause of the speed oscillations was a failure of one of the dropping resistors in the Governor Unit. The resistor was replaced. The equivalent resistor on the 1B DG had failed several weeks earlier during maintenance. Byron Station, which has four DGs that are identical to Braidwood's DGs, had experienced a failure of this resistor also. This event was screened for reportability. Based on the failures experienced at Braidwood and Byron it was determined that a four hour non-emergency report was appropriate pursuant to 10CFR50.72(b)(2)(iii)(A).

The appropriate NRC notification via the ENS phone system was made at 1220.

At 1607 the 2A DG was started for a maintenance test. The DG successfully completed the test, DG speed remained constant at 600 RPM.

At 1615 the 2A DG was shut down.

At 1653 the 2A DG was started for its monthly operability run.

At 1819 the 2A DG was shut down. The DG had successfully completed the test. DG speed remained constant at 600 RPM.

At 2118, following the completion of the reviews of the test run data and the work package, the 2A DG was declared operable.

This event is being reported pursuant to 10CFR50.73(a)(2)(v)(A)-any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to shutdown the reactor and maintain it in a safe shutdown condition.

C. CAUSE OF EVENT:

The root cause of the event was component failure. The resistor in the governor power-dropping resistor board failed open. The failed resistor is one of 2 resistors in parallel on the positive lead of the governor's DC power supply. With one of the resistors failed, creating an open circuit, the voltage drop across the remaining resistor increased resulting in insufficient power supply to the governor. An evaluation of the failure mode of the resistor was conducted by Sargent and Lundy Engineers. Based on the results of this evaluation it has been concluded that the cause was simple long term heat fatigue.

D. SAFETY ANALYSIS:

This event had no effect on the safety of the plant or the public. The 2B DG was operable and available throughout the event. Only 1 DG is required in Mode 6.

Under the worst case conditions of this failure occurring after a valid initiating signal following a Safety Injection there would still be no effect. The redundancy of the safety system design provides for full safe shutdown capability from a single ESF bus. The diversity of the electrical distribution system provides for powering an ESF bus from its System Auxiliary Transformer, its own Diesel Generator, or its corresponding opposite Unit ESF bus which is capable of being powered from its Diesel Generator or System Auxiliary Transformer. This is enveloped in section 8 of the Updated Final Safety Analysis Report.

E. CORRECTIVE ACTIONS:

Both power dropping resistors in the 2A, 1A and 1B DG were replaced. These resistors had been replaced on April 4, 1990 for the 2B DG.

These resistors have been placed on a replacement frequency of three years in accordance with the recommendations of the Engineering evaluation.

The resistor is being evaluated for 10CFR part 21 applicability. This action is being tracked to completion by action item 457-200-90-01001.

F. PREVIOUS OCCURRENCES:

There have been no previous similar reported occurrences at Braidwood Station.

G. COMPONENT FAILURE DATA:

Manufacturer	Nomenclature	Model Number/MFG Part Number
Pacific	Resistor	100 CH 300 ohm 70 watt resistor

Note: This item supplied as part of the Woodward Governor Model 2301.