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10CFR21.21

PART 21

Docket No. 50-461

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

Subject: 10CFR21 Final Report 21-95-010: Elgar Inverter PWM Drive Logic Card (J4) Failure

Dear Sir:

On March 24, 1995, a new PWM drive logic card (J4) was installed in the Division 2 Nuclear Systems Protection System (NSPS) inverter at Clinton Power Station (CPS). The new card failed after four to six hours of operation during calibration of the inverter. At the time of the failure, the inverter was out of service to replace the logic card with this revised card in accordance with a scheduled maintenance activity.

On May 22, 1995, Illinois Power (IP) issued 10CFR21 Interim Report 21-95-010: Elgar Inverter PWM Drive Logic Card (J4) Failure, (IP letter U-602446), to notify the NRC that IP was evaluating logic card failures in accordance with the provisions of 10CFR21. At the time the report was issued, IP did not know the cause of the card failure, but had returned the logic card to the supplier for failure analysis.

On July 12, 1995, IP issued a follow-up letter to the NRC (IP letter U-602466) to report that the evaluation of the J4 logic card failure was not complete. Testing performed by Elgar Corporation at their facilities did not identify any manufacturing or design deficiencies in the logic cards; however, since the cards did fail in the CPS inverter, Elgar performed additional testing of the cards on site (at CPS). At the time the follow-up letter was issued, Elgar had not completed their evaluation of the on-site test results.

Since the July 12 submittal, Elgar completed their evaluation of the data obtained from the on-site testing and determined the testing results were inconclusive. Elgar had planned to perform additional testing of the cards on site using the installed inverters; however, IP evaluated the risk to the operability of the inverter and determined that testing will not be permitted during plant operation. IP has determined that the next potential window of opportunity for using the installed inverters for testing is the sixth refueling outage (RF-6), currently scheduled to begin in October, 1996. However, at this

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during a loss of offsite power (LOOP) condition, the NSPS loads would be transferred to the alternate AC power source which may not be available due to the LOOP condition and the NSPS loads would lose power.

(v) The logic card failure was discovered on March 24, 1995. On March 25, 1995, IP determined that the failure was potentially reportable under the provisions of 10CFR, Part 21.

(vi) IP received one other logic card part number 642-108-40, revision F. This logic card was identified as deficient when it was initially installed in the Division 1 NSPS inverter during a similar maintenance activity. Following installation of the card, the Division 1 NSPS inverter would not operate, that is, the inverter SCR drive section operation would not function. The failure of the card installed in the Division 1 NSPS inverter was obvious and could not have gone undetected since the inverter could not be declared operable if the SCR drives were inoperable. IP has no information about logic cards that may have been supplied to other purchasers.

(vii) The logic card that failed in the Division 1 NSPS inverter has been replaced with the original logic card, part number 642-108-40, revision A. The logic card that failed in the Division 2 NSPS inverter has been replaced with a logic card part number 642-108-40, revision E. Both logic cards that failed have been returned to Elgar Corporation for failure analysis. IP will continue to track this issue in accordance with Condition Report 1-95-03-113.

(viii) IP has no advice to offer other purchasers or licensees about this issue at this time. Additional information about this issue may be obtained by contacting D. G. Lukach, system engineer, at (217) 935-8881, extension 3952.

Sincerely yours,

D. G. Cook
Vice President

RSF/csm

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
INPO Records Center
Illinois Department of Nuclear Safety
Elgar Corporation

time, IP has not made a commitment to allow testing during RF-6. The CPS inverters have had other continuing problems and IP is in the process of evaluating their reliability. Therefore, IP is pursuing two success paths for the inverters, one being to replace the inverters, the other being to correct the continuing materiel problems of the existing inverters.

IP has concluded that the failure of the logic cards is reportable under the provisions of 10CFR21 and considers this document to be the final report on this subject. Elgar Corporation should be contacted for further information regarding the cause of the logic card failures.

IP provides the following information in accordance with 10CFR21.21(c)(4). Initial notification of this matter will be provided by facsimile of this letter to the NRC Operations Center in accordance with 10CFR21.21(c)(3) on the date this letter is signed by the responsible officer.

(i) J. G. Cook, Vice President of Illinois Power, Clinton Power Station, Post Office Box 678, Clinton, Illinois, 61727, is the responsible officer informing the Nuclear Regulatory Commission (NRC) of a condition reportable under the provisions of 10CFR, Part 21, by means of this report.

(ii) The basic component involved in this condition is a PWM drive logic card, part number 642-108-40, revision F. The logic card was installed in the Division 2 NSPS inverter. The inverter provides 120 volts alternating current (AC) uninterruptible power to loads such as NSPS logic power, neutron monitoring, process radiation monitoring, portions of the leak detection system, nuclear steam supply shutoff system valves and loss of coolant accident bypass relays during all modes of operation including abnormal and accident conditions. The logic card provides control signals to the SCR (silicon controlled rectifier) drives. The same logic card part can be used in the Divisions 1, 2, 3, and 4 NSPS inverters but the revised card was never installed in the Divisions 3 and 4 inverters at CPS.

(iii) The logic card was manufactured by Elgar Corporation and supplied to CPS by Elgar Corporation/General Electric.

(iv) IP installed the logic card in the inverter during a scheduled maintenance activity. During calibration of the inverter, the logic card operated for four to six hours and then failed for no known reason.

The failure of the logic card causes the inverter to shut down. When this occurs, the inverter loads are transferred to the alternate AC source of power. During the failure of the logic card at CPS, the inverter was out of service for scheduled maintenance and not required to be operable. However, if the logic card had failed