

ILLINOIS POWER COMPANY

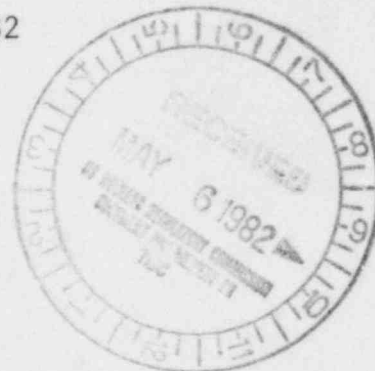


U-0475

L30-82(04-29)-L

500 SOUTH 27TH STREET, DECATUR, ILLINOIS 62525

April 29, 1982



Mr. James R. Miller, Chief
Standardization & Special Projects Branch
Division of Licensing
Office of Nuclear Reactor Regulations
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Miller:

- References: 1) Clinton Power Station Safety Evaluation Report,
Section 9.5.1.4 re: Fire Detection Systems
- 2) Letter, J. D. Geier to J. R. Miller, U-0391,
dated 12-14-81

Clinton Power Station Unit 1
Docket No. 50-461
Safety Evaluation Report
Supplemental Fire Detection Information

On December 10, 1981, Alan L. Ruwe (IP), Mark S. Zar (S&L) and J. Scott Steele (S&L) met in Bethesda with John Stang (NRC Chemical Engineering Branch) to discuss the Clinton fire detection system. The letter in reference 2 transmitted attachments which documented the agreements reached during that meeting and indicated that this topic was considered confirmatory by the NRC and IP.

On January 11, 1982, Mr. Stang contacted Illinois Power with additional questions on the Clinton fire detection system. The attachment to this letter provides the requested information.

Illinois Power believes all requested information has now been provided to the NRC on the subject issue and now considers this confirmatory item closed.

Sincerely,

G. E. Wuller
Supervisor-Licensing
Nuclear Station Engineering

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Attachment (1)

cc: J. H. Williams, NRC Clinton Project Manager
John Stang, NRC CEB
H. H. Livermore, NRC Resident Inspector
Illinois Department of Nuclear Safety

MAIN CONTROL ROOM FIRE PROTECTION ANNUNCIATORGeneral

The Fire Protection Annunciator is located at panel 1H13-P840 in the Main Control Room. It serves as the central alarm panel for the Clinton Fire Detection and Protection System. Its purpose is to attract the operator's attention to fire protection system variables that are off-normal. This is accomplished by the use of flashing lighted windows and audible alarms.

Power Sources

The primary power source for the annunciator is the station non-Class 1E 125V dc power supply which has a four-hour battery backup following the loss of offsite power. A dedicated circuit is provided so the annunciator can be manually connected to a Class 1E power supply within four hours following the loss of offsite power. The annunciator is equipped with a power failure alarm which operates from a non-Class 1E 120V ac power supply. It consists of a dedicated annunciator point and alarm horn.

Equipment Design

The annunciator is of the solid state type, utilizing plug-in type cards, plugs, and receptacles. The window displays are flush mounted in panel 1H13-P840 and the window control logic is contained on a single printed circuit board that plugs into an edge connector. Each window contains two long-life light bulbs which are wired in parallel and which are tested once each 8-hour shift.

Detection of a fire is alarmed on the P840 annunciator and at the local supervisory control panel. Both panels also have lights which indicate the specific zone initiating the alarm. Should the P840 zone light fail, the P840 annunciator window would initiate operator action to inspect the local supervisory control panel to determine the specific zone initiating the alarm.

The annunciator has three audible alarms - an alarm horn, a ringback horn and a power failure horn - all are distinctly different. Operation of an audible alarm on the P840 Fire Protection Annunciator also alarms an annunciator point on the Balance of Plant Benchboard Annunciator located at panel 1H13-P870 in the Main Control Room to further attract the operator's attention.

The P840 annunciator has three flash rates - a fast flash, a slow flash and a galloping flash - all are distinctly different. The fast flash rate is 10.8 Hz

with a 50 percent duty cycle; the slow flash rate is 1.2 Hz with a 50 percent duty cycle; and the galloping flash rate consists of the fast flash and the slow flash AND'ed together; i.e., annunciator window is flashing at fast flash rate during the slow flash rate "on" time and window is off during slow flash rate "off" time.

The annunciator has four momentary pushbuttons used in its operation. They are labeled Silence, Acknowledge, Reset and Test.

Circuits Monitored For Integrity

The annunciator monitors the integrity of primary incoming fire alarm circuits from systems located in buildings containing safety-related equipment and certain other fire-related alarm circuits. The circuits monitored for integrity meet the performance requirements of Style 1 listed in Table 3-10.1 of NFPA 72D-1979.

The galloping flash is provided at the annunciator to indicate the integrity of monitored circuits. The galloping flash indicates trouble due to an open in the field wiring of a circuit. (See Figure 9.5-9 attached.) An open circuit occurring between the P840 annunciator and the local fire control panel will prevent the annunciator from receiving a fire alarm from the circuit. However, redundant fire alarm circuits are provided between P840 annunciator and the local panel.

A ground detection unit is provided at the P840 annunciator. It alarms a dedicated annunciator point if a ground occurs in the wiring between the annunciator and the local panel.

A single ground does not prevent the annunciator from receiving an alarm from a circuit monitored for integrity.

Operation

The annunciator logic sequence is illustrated in Figures 1, 2 and 3. Figure 1 applies to all the annunciator circuits, Figure 2 applies only for the circuits monitored for integrity and Figure 3 applies to the Power Failure Alarm.

The operation of the annunciator pushbuttons must take place in the following sequence: Silence, Acknowledge and Reset. Any other sequence will not change the state of the annunciator. Operation of the Test pushbutton will cause all the annunciator windows to fast flash and operate the audible alarms. Any conditions existing before the operation of the Test pushbutton will return after the test.

The annunciator system is designed such that fire alarm conditions take precedence over trouble alarms for those circuits monitored for integrity.

Compliances

The annunciator meets the requirements of paragraph 2411 of NFPA 72D-1975 in the following manner:

1. The occurrence of a break or a ground fault condition in the field wiring of an annunciator circuit monitored for integrity will be indicated at the annunciator by a distinctive trouble signal.
2. The failure of the annunciator main power supply source will be indicated at the annunciator by a distinctive trouble signal.

An engineering evaluation was conducted to ascertain the conformance of the P840 annunciator to the applicable portions of UL 864-1980 (Standard for Control Units For Fire Protective Signaling Systems). It is our opinion that the annunciator does meet the intent of the requirements necessary for a UL label; however, because the original purchase specification did not specify a UL label, the P840 annunciator does not carry the same.

FIGURE 1

Logic Diagram For The Fire
Protection Annunciator

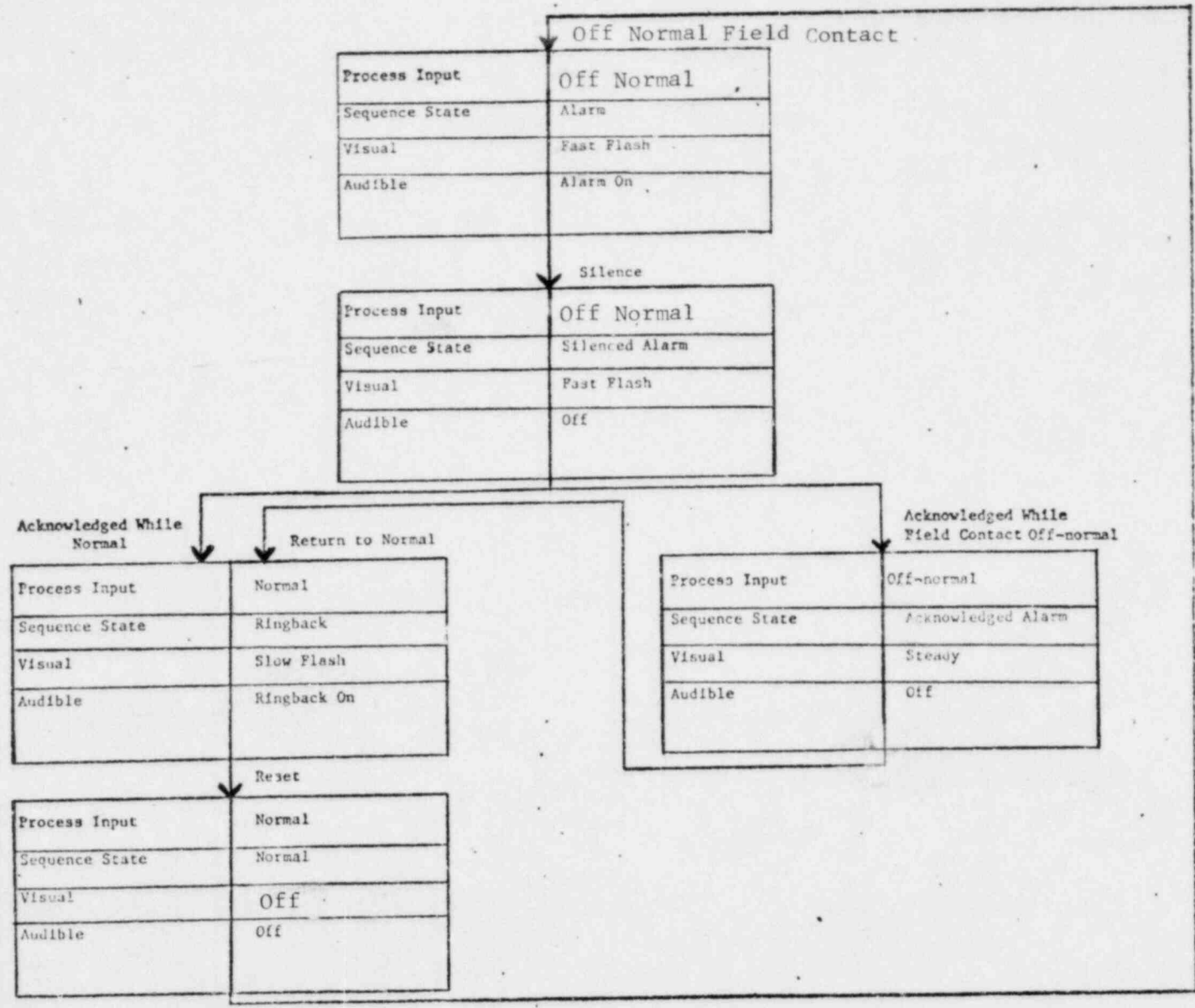


FIGURE 2

Additional Logic Diagram For
The Fire Protection Annunciator
Circuits Monitored For Integrity

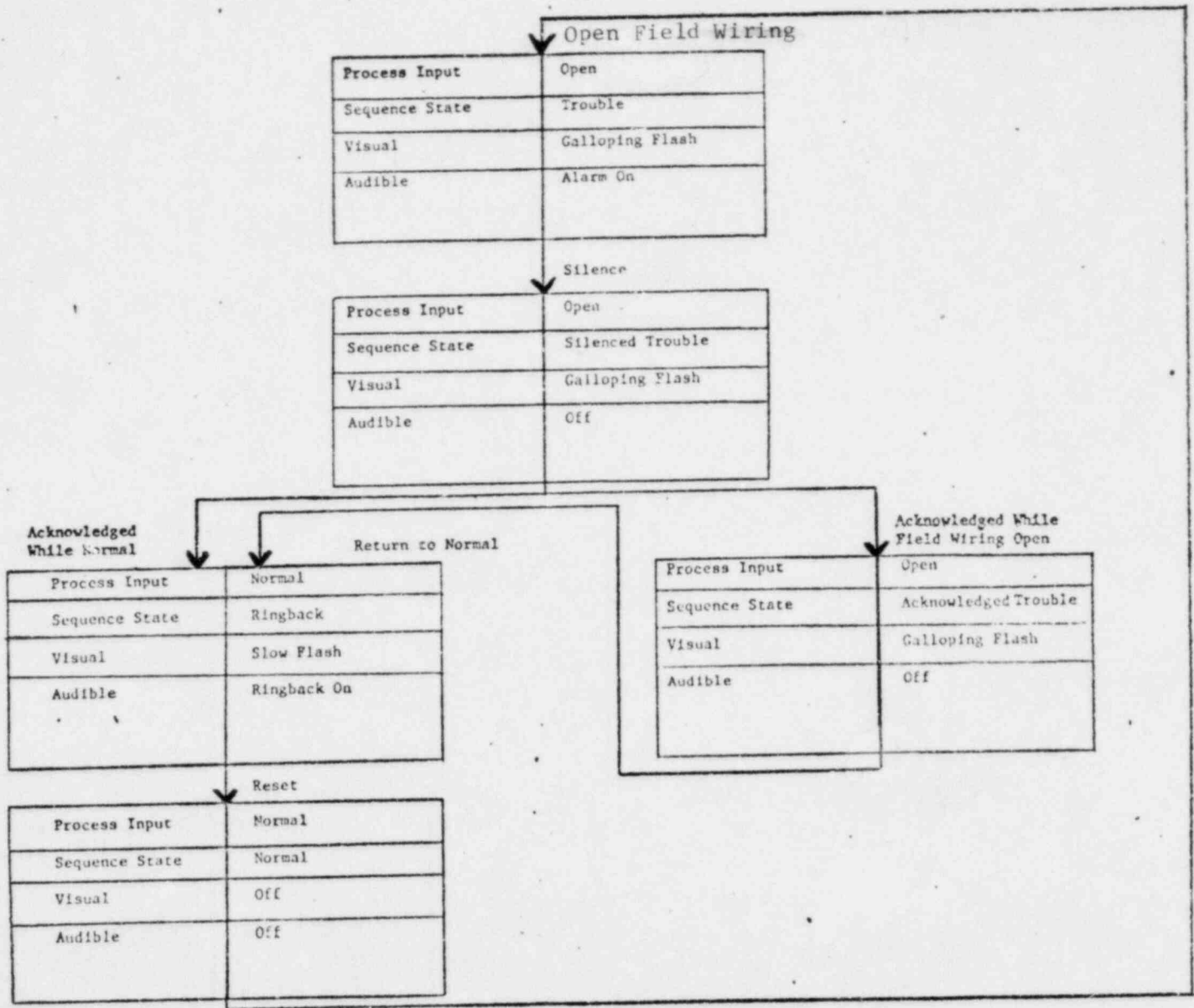


FIGURE 3

Logic Diagram For The Fire
Protection Annunciator Power
Failure Alarm

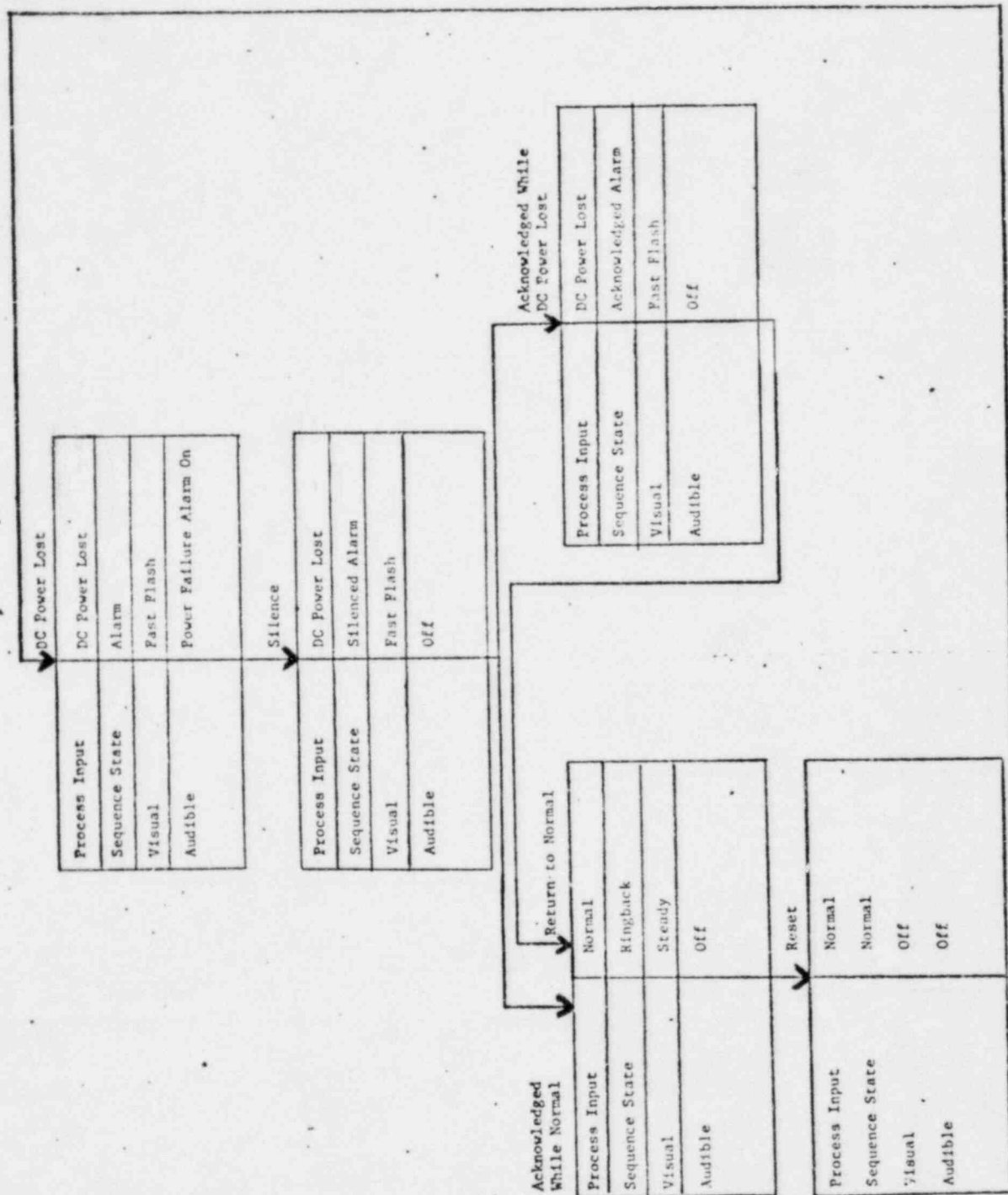


FIGURE 9.5-9

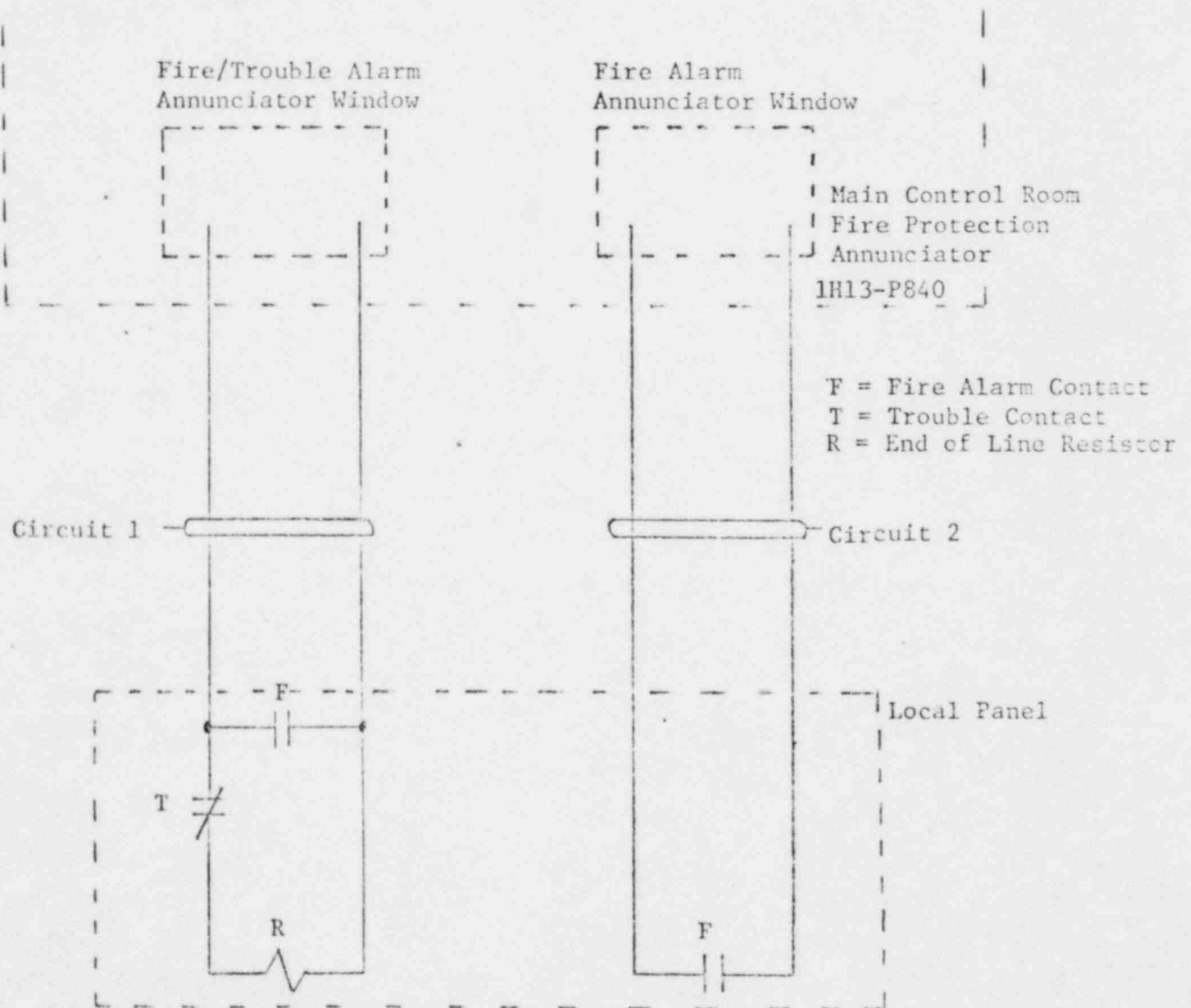
CLINTON POWER STATION UNIT 1

TYPICAL FIRE AND TROUBLE ALARM

INDICATION FOR DETECTION AND SUPPRESSION

SYSTEMS LOCATED IN BUILDINGS

CONTAINING SAFETY-RELATED EQUIPMENT



Circuit 1 operation provides separate visual indication of fire or trouble. Circuit 2 provides redundant fire alarm receipt capability.