Requirements for simple alarm units for use with automatic sprinkler systems are contained in NFPA No 13, *Sprinkler Systems, Installation* The open circuit alarm system is not recommended because if the power fails or if the circuit is broken, no warning is given

Plants in areas where municipal fire departments are available usually have a municipal alarm box close to the plant entrance or in one of the buildings Others may have auxiliary alarm box areas, connected to the municipal fire alarm system, at various points in the plant Another system often used is a direct connection to the nearest fire station which may register by a water alarm on the sprinkler system or be set off manually If possible, the fire alarm system should be connected with the local fire fighting alarm, and have an independent power supply

In large cities private central station services are available and provide excellent protection These central stations receive signals from plant fire alarm boxes, watchmen, sprinkler head operations, and other hazard control points in the plant Being able to give undivided attention to matters of plant security, they can relay information to fire or police departments without delay The signal received at the fire department or assistance agency should locate specifically the site of the fire, or at least the building or area, so the fire can be found quickly

Automatic sending stations (thermostatic detectors) may be used, but should not interfere with the sending of the manual alarm

Regular checks should be made on the alarm system All stations should be inspected on a monthly basis by a responsible person, and the overall system should have a daily test to ensure it is in proper operating condition These daily tests should be conducted at a prearranged time and under a variety of wind and weather conditions to determine whether the signal can be heard in all parts of the plant at all times

Basic principles of alarm systems The National Fire Protection Association lists in its *Fire Protection Handbook* five basic principles that are important to all evacuation alarm systems

- That the alarm signal must be distinctive is a major reason for not adapting existing programing or paging systems to be used as fire alarm systems, for not using fire alarm systems for other purposes, and for not combining fire alarm elements, during installation, with those of devices used for other purposes The type of signal must be suitable to the circumstances in which it is used audible signals cannot warn the deaf, nor can visual signals effectively warn the blind

- The alarm must be seen or heard by all occupants for whom the warning is intended Location and type of alarms and their sound intensity must be carefully planned If an alarm system is used for evacuation purposes only, it is unnecessary and may be confusing to sound a coded signal A continuous one is preferable

- The system must be arranged so that it can be tested periodically Tests are best conducted in connection with evacuation drills, and alarms sounded in the tests should be the same as those used for emergency conditions

- Equipment should be designed and installed so that malicious operation is, at least, difficult In general the operation of a station should show that the station has been operated, such as by requiring a glass to be broken before the alarm can be activated

- The probable reaction of people in a protected premises must be considered when deciding whether a general (public) alarm shall be given (which may induce panic) or whether the alarm should be recognizable only by selected personnel who can promptly handle the evacuation

Electrical industrial signals. There are a number of major types of electrical industrial signals available They differ in recommended use, tone, and range of signal [*]

The various types of signal equipment available include

---

[*] This discussion is taken from Robert J Barnard, "Three Keys to Specifying Electrical Industrial Signals Proper Type, Proper Loudness, Proper Location" *Actual Specifying Engineer*, Medalist Publications, Inc , 5 90-91 (May 1961)