283000 - FIRE ALARM AND DETECTION

1. In general, the night lights shall be on the emergency power system and utilized as emergency lights.

2. Provide all buildings with an electrically operated, supervised, closed circuit, and addressable voice fire alarm system. The equipment shall include master control panel, break stations, combination speakers and lights, annunciators, smoke detectors, door holders, etc.

3. The system shall include integration of automatic tornado warning.

4. The equipment shall be manufactured by Simplex Time Recorder Co. or Edwards Systems Technology unless other manufacturers are approved by the University.

5. Tornado signals and fire alarm signals shall have distinct tone differences. Provide the tone for each signal as directed by the University.

6. In Residence Halls, room smoke detectors, when activated, shall sound their local alarm only and annunciate at the control panel and annunciators. If not reset within an adjustable time period building alarm devices will sound.

7. The fire alarm control panel shall be designed for surface mounting. Control panel construction shall be modular with solid state, microprocessor based electronics. It shall display only those primary controls and displays essential to operation during a fire alarm condition. Keyboards or keypads shall not be required to operate the system during fire alarm conditions. Scrolling through menu options or lists shall be accomplished in a self-directing manner in which alphanumeric prompting messages shall direct the user. Control panel shall use "B" key lock on door.
   a. The control panel shall have a 2 line x 40 character liquid crystal display, which shall be backlit for enhanced readability. The display shall support both upper and lower case letters.
   b. The system shall be capable of logging and storing 300 events in an alarm log and 300 events in a trouble log. Each recorded event shall include the time and date of that event's occurrence.
   c. The system shall be capable of being tested by one person. While in testing mode, the alarm activation of an initiating device circuit shall be silently logged as an alarm condition in the historical data file. The panel shall automatically reset itself after logging of the alarm.
   d. The control panel shall be capable of supporting up to 8
separate testing groups whereby one group of points may be in a testing mode and the other (non-testing) groups may be active and operate as programmed per normal system operation. After testing is considered complete, testing data may be retrieved from the system in chronological order to ensure device/circuit activation.

e. Should an alarm condition occur from an active point, not in walk test mode, it shall perform its preprogrammed alarm functions.

f. Should a trouble condition be present within the system and the audible trouble signal silenced, the trouble signal shall resound at preprogrammed time intervals to act as reminder that the fire alarm system is not 100% operational. Both the time interval and the trouble reminder signal shall be programmable to suit the University’s application.

g. There shall be four (4) access levels with level 4 being the highest level. Level 1 actions shall not require a passcode. Passcodes shall consist of up to ten (10) digits. Changes to passcodes shall only be made by authorized personnel.

h. The control panel shall have an alarm verification feature, field selectable for smoke detector zones, whereby the panel will reset the activated detector and wait for a second alarm activation. The control panel shall have the capability to display the number of times (tally) a zone has gone into a verification mode. Should this smoke verification tally reach a pre-programmed number, a trouble condition shall occur. Alarm verification zones shall be able to be divided into eight separate groups whereby only verification zones from the same group will confirm the first activation and cause the alarm sequence to occur.

i. The control panel shall have the capability to operate addressable or hard wired devices, such as 2-wire smoke detectors over existing, non-twisted, non-shielded wiring.

j. The control panel shall have the capability for cross zoning.

k. Fire alarm control panel shall have the future capability of operating remote CRT’s and/or printers; output shall be ASCII from an EIA RS-232-C connection with an adjustable baud rate. Each RS-232-C port shall be capable of supporting as many as four (4) remote CRT displays or printers. The fire alarm control panel shall support up to five (5) RS-232-C ports.

l. The fire alarm control panel shall have the capability to operate as a proprietary local system with data communication to a higher order Central Processing Unit (CPU), the Simplex 2120, via a twisted shielded pair of wires. The higher order system shall be capable of supporting at least 250 monitor
points, without limit to the type and 250 control points without limit to the type. The system shall be capable of supporting a combination of contact devices, 2-wire and 4-wire smoke detectors, addressable devices, and true-alarm adjustable sensitivity detectors on the same system. The Central Processing Unit (CPU) shall monitor all alarms and troubles of the fire alarm control panel. All data communication wiring between the CPU and fire alarm control panel shall be supervised for opens, shorts and grounds.

m. The fire alarm control panel shall have the capability to accommodate up to 1000 points. It shall also be capable of communicating via network communications with the fire alarm control panels in the other sections of the building.

n. The system must provide communication with initiating and control devices individually. All of these devices will be individually annunciated at the control panel. All addressable devices shall have the capability of being disabled or enabled individually or in groups.

o. Up to 127 addressable devices may be multi-dropped from a single pair of wires. Systems that require factory reprogramming to add or delete devices are unacceptable.

p. The communication format must be a completely digital poll/response protocol to allow t-tapping of the circuit wiring. The system must be capable of communicating over non-twisted, non-shielded wiring. Systems that do not utilize full digital transmission protocol are not acceptable.

q. Each addressable device must be uniquely identified by an address code entered on each device at time of installation. The use of jumpers to set address will not be acceptable due to the potential of vibration and poor contact. Device identification schemes that do not use uniquely set addresses but rely on electrical position along the communication channel are unacceptable. These systems cannot accommodate t-tapping and the addition of an addressable device between existing devices requires reprogramming all existing electrically further devices. The system must verify that proper type device is in place and matches the desired software configuration. Device address must be set by switches in detector's base (not in detector's hood) for ease of servicing.

r. Wiring types will be approved by the equipment manufacturer. The system shall allow a line distance of up to 2,500 feet to the furthest addressable device on a Class B circuit.

8. Manual stations shall be double action addressable. In Residence
Halls manual stations shall be surface or semi-flush double action addressable, with Simplex 2099-9815 covers with battery and built-in horn. Pull stations will contain electronics that communicate the station's status (alarm, normal) to the fire alarm control over two wires which also provide power to the pull station. The address will be set on the station. The station will be manufactured from high impact red Lexan and will mechanically latch upon operation and remain so until manually reset by opening with a key common to all system locks. The addressable manual station shall be capable of field programming of its "address" location on an addressable initiating circuit. Station shall use Simplex "B" key to reset.

9. Fire alarm signals shall be provided with semi-flush mounted signal and lamp unit with red trim and red lenses imprinted with the word "FIRE".

10. Fire alarm signals shall be twenty-four (24) VDC speakers and strobes designed for mounting in signal lamp unit.

11. Ceiling smoke detectors shall be addressable photoelectric type. In Residence Halls, room detectors shall include a local 90 dB sounder.

12. Duct ionization smoke detectors shall be furnished with sampling tubes and sensor. Detectors shall also contain a panel programmable relay to control fan shutdown upon this device activation, or upon activation of any other device in system.

13. The remote annunciator shall be serial LCD type with 80 character display. The annunciator shall duplicate the signals occurring at the main control panel. Also provided shall be:
   a. Control pushbutton switches for: Alarm silence, trouble silence, system reset and manual evacuation duplicating the control panel switches. A key "enable" switch shall be provided to activate or deactivate the control switches.
   b. Tone Alert: Duplicates the control panel piezo during alarm and trouble conditions.
   c. System trouble LED.
   d. Power on LED.

14. The tornado warning system shall consist of a VAR Receiver interfaced to the alarm system such that, when activated, the following shall occur:
   a. The tornado warning tone within the fire alarm system shall be activated to cause the tornado signal to sound throughout the entire building.
b. The signals may be reset by operating the signal silence button on the alarm panel.

15. All wiring shall be in conduit. Color code shall be used and all wires shall be tagged at all junction points and shall test free from ground or crosses between conductors.

16. The completed fire alarm system shall be fully tested in accordance with NFPA-72H by the Contractor in the presence of the A/E, the University's representative and the local Fire Marshal. Upon completion of a successful test, the Contractor shall so certify in writing to the University.