

UL 827

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Central-Station Alarm Services

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Underwriters Laboratories Inc. (UL)
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UL Standard for Safety for Central-Station Alarm Services, UL 827

Sixth Edition, Dated October 1, 1996

Revisions: This Standard contains revisions through and including January 12, 2007.

Summary of Topics

These revisions are being issued to add performance requirements for satellite stations that are manually operated, to add requirements for multiple call verification and to delete the certification requirements in 1.12.

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The following table lists the future effective dates with the corresponding item.

Future Effective Date	References
December 31, 2008	Paragraphs 11.6, 11.9, 11.10, 11.12 and 11.13

The revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated November 4, 2005 and July 26, 2006.

The revisions dated January 12, 2007 include a reprinted title page (page1) for this Standard.

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6-8B	January 12, 2007
9-11	October 1, 1996
12	April 23, 1999
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23	April 23, 1999
24-26	October 1, 1996
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B3-B4	January 12, 2007
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INTRODUCTION

1 Scope

1.1 These requirements apply to:

- a) Central-stations providing watchman, fire-alarm, and supervisory services as described in the National Fire Alarm Code, NFPA 72;
- b) Central-station burglar-alarm systems intended and specifically designated for burglary protection use at mercantile and banking premises, on mercantile safes and vaults, and on bank safes and vaults; and
- c) Residential monitoring stations monitoring residential alarm systems.

1.2 These requirements apply to central-stations, subsidiary stations and residential monitoring stations that are intended to be located in buildings constructed in accordance with building codes, such as the Building Officials and Code Administrators (BOCA) National Building Code, the Standard Building Code, and the Uniform Building Code.

1.3 The central-station burglar- and fire-alarm station and residential alarm systems covered by these requirements are systems in which the operation of electrical protection circuits and devices are signaled automatically to, recorded in, maintained in, and supervised from a central-station or residential monitoring station having trained operators and runners on duty at all times.

1.4 Requirements covering the construction and operation of burglar-alarm units used in the burglar-alarm systems covered by this Standard are contained in the Standards for Central-Station Burglar-Alarm Units, UL 1610, and Digital Alarm Communicator System Units, UL 1635.

1.5 Burglar-alarm protective devices installed on individual properties are classified as to the extent of protection at each location. Requirements covering installation and classification (of extent) of alarm protective equipment at individual locations are contained in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681.

1.6 Requirements covering the construction and operation of fire-protective signaling equipment used in the systems covered by this standard are contained in the Standard for Control Units for Fire-Protective Signaling Systems, UL 864.

1.7 Systems covered by these requirements operate within the limits of the National Electrical Code, ANSI/NFPA 70, as applied by the local authority having jurisdiction. The Articles of the National Electrical Code that apply are:

- a) Article 725, within the limits of Class 2 or Class 3 remote-control and signaling circuits for burglar-alarm systems;
- b) Article 760 for fire-alarm systems;
- c) Article 800 for outside wiring and protectors; and
- d) Article 820 for protectors for radio antennas.

1.8 Requirements for software and hardware, and the installation and operation of an automation system in a central-station, subsidiary station or residential monitoring station are covered by the Standard for Central-Station Automation Systems, UL 1981, or by the Standard for Control Units for Fire-Protective Signaling Systems, UL 864, and/or Central-Station Burglar-Alarm Units, UL 1610.

1.9 Relocated as 1.12 October 1, 1997

1.10 A reference made to "station" refers to a central-station (burglary or fire), subsidiary station or residential monitoring station, depending upon the context in which it is used.

1.11 These requirements do not cover the communication channel between the protected property and the station. This includes:

- a) The company that provides the communication channel and
- b) The equipment that is used to provide the communication channel.

Exception No. 1: If the communication channel is owned and operated by the station, these requirements do apply.

Exception No. 2: These requirements do apply to an alarm and signal transport service company.

1.12 Deleted January 12, 2007

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, a component used in a station or a burglar-alarm or fire-alarm installation covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used to provide the services covered by this standard.

2.1.2 A component need not comply with a specific requirement that:

- a) Involves a feature or characteristic not needed in the application of the component in the product covered by this standard or
- b) Is superseded by a requirement in this standard.

2.1.3 A component shall be used in accordance with its recognized rating established for the intended conditions of use.

2.1.4 Specific components are recognized as being incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions for which they have been recognized.

2.2 Units of measurement

2.2.1 If a value for measurement is followed by a value in other units in parentheses, the second value may be only approximate. The first stated value is the requirement.

2.3 Undated references

2.3.1 Any undated reference to a code or standard in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

3 Glossary

3.1 General

3.1.1 For the purpose of this standard, the following definitions apply.

3.2 Definitions common to burglar- and fire-alarm systems

3.2.1 ACTIVE SYSTEM – A system that transmits one or both of the following signals to the central-station on a regular basis:

- a) A signal that the system has been disarmed and the protection removed (commonly referred to as "opened") or
- b) A signal that the system has been armed and the protection activated (commonly referred to as "closed").

If an alarm system sends opening and closing (disarm and arm) signals, it is considered to be an active system. The 24-hour supervisory check-in signal transmitted by a digital alarm communicator transmitter or a one-way radio (RF) transmitter does not make a system an active system. A system is considered inactive if the 24-hour supervisory check-in signal is the only signal normally transmitted on a daily basis.

3.2.2 ALARM AND SIGNAL TRANSPORT SERVICE – A service provided by a company to transmit signals from a protection system to either a station, law enforcement department, fire department, or the like. The service may be connected to multiple stations, law enforcement departments, fire departments, and the like. The service is independent of the protection systems and the organizations that receive the alarms and signals. A company providing this service provides the equipment, service, and maintenance for the transport system. The equipment used in the transport system shall comply with the requirements of the Standards for Control Units for Fire-Protective Signaling Systems, UL 864, and Central-Station Burglar-Alarm Units, UL 1610.

3.2.3 AUTOMATIC FIRE-ALARM SYSTEM – A fire detection system that will automatically detect and annunciate the presence of fire by the detection of one or more products of combustion. Annunciation is through a fire-alarm system control unit.

3.2.4 BUILDING, MULTIPLE OCCUPANCY – A building that is occupied by two or more independent tenants which do not have control of or association with each other.

3.2.5 BUILDING, SINGLE OCCUPANCY – A building that is occupied by and under the control of the alarm service company only. Any business in the building that is not directly associated with the alarm service shall be the business of, and controlled by, the alarm service company.

3.2.6 CENTRAL-STATION – A building or enclosed area within a building that houses an operating room and equipment used to provide central-station service to protected properties.

3.2.7 CENTRAL-STATION SERVICE – The use of a system or a group of systems in which the operation of circuits and devices at a protected property are signaled to, recorded in, and supervised from a central-station having trained operators who, upon the receipt of a signal, take such action as required by the nature of the signal received.

3.2.8 DERIVED CHANNEL – A signaling line circuit that uses the local leg of the public telephone company's switched network as an active multiplex channel, while simultaneously allowing the leg's use for normal telephone communications.

3.2.9 DIGITAL ALARM COMMUNICATOR RECEIVER (DACR) – A system component located at the central-station that will receive and display signals from a DACT (see 3.2.10).

3.2.10 DIGITAL ALARM COMMUNICATOR TRANSMITTER (DACT) – A system component located at the protected premises that will contact a DACR (see 3.2.9) through the public telephone company's switched network or through a cellular telephone system (dial system) and transmit the necessary data to identify the protected premises and the change of status. A DACT is either integral with the control unit that provides alarm or monitoring functions, or interfaces with a control unit that provides these functions.

3.2.11 DIGITAL ALARM RADIO RECEIVER (DARR) – A system component used in a DARS (see 3.2.12) to receive radio signals transmitted from a DART (see 3.2.13).

3.2.12 DIGITAL ALARM RADIO SYSTEM (DARS) – A one-way radio system that provides backup transmission for a DACT (see 3.2.10).

3.2.13 DIGITAL ALARM RADIO TRANSMITTER (DART) – A system component used in a DARS (see 3.2.12) to transmit signals to a DARR (see 3.2.11) via radio signals.

3.2.14 HUNT GROUP – A group of associated telephone lines within which an incoming call is automatically routed to an idle (not busy) telephone line for completion.

3.2.15 IDENTIFICATION CODE – The numeric, alpha numeric, alpha, word(s), or similar device used to identify a subscriber.

3.2.16 INACTIVE SYSTEM – A system that transmits a signal to the central-station only when an unintended condition exists or it is under test. Examples of inactive systems are fire- and holdup alarms, or a burglar alarm system supervising a protected premise without the use of opening and closing signals. The 24-hour supervisory check-in signal transmitted by a digital alarm communicator transmitter or a one-way radio (RF) transmitter does not make a system an active system. Such a system is considered inactive if that is the only signal transmitted on a daily basis.

3.2.17 KEY VAULT – An attack resistant container mounted outside of the protected premises that contains the key(s) that will allow entrance into the protected premises. The key vault can be opened with a mechanical key or a card key that is common to several key vaults and which is carried by the runner. Other emergency services, such as the fire department, law enforcement department and authorized private guard service may also have access to the key vault.

3.2.18 ONE-WAY RADIO ALARM SYSTEM (OWRAS) – A system in which alarm system signals are transmitted from a RAT (see 3.2.25) through a radio channel to at least two independently powered, independently operating, and separately located RARSRs (see 3.2.23) and which are then relayed to a

RASSR (see 3.2.24). Signals may be transmitted through one RARSR provided they are also transmitted directly to the RASSR.

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3.2.19 OPERATING ROOM – The physically enclosed area within a station that is physically secure and where the operators receive and act on the signals that are transmitted to the station.

3.2.20 OPERATOR – A trained employee stationed at the station whose duty is to provide immediate response to all signals received.

3.2.21 PERSONAL IDENTIFIER – A physical attribute of a person used as a means of verification of personnel identity, such as by retina scan, voice print, fingerprint, hand span, and the like.

3.2.22 POWER ROOM – The area(s) in which the primary and secondary power supplies are housed. This room may or may not include an engine driven generator or uninterruptible battery supply.

3.2.23 RADIO ALARM REPEATER STATION RECEIVER (RARSR) – A system component, used in a OWRAS (see 3.2.18) or a TWRAS (see 3.2.35), consisting of a radio receiver and transmitter located at a repeater station or subsidiary station. This component receives radio signals from a RAT (see 3.2.25) and retransmits them to another RARSR or to a RASSR (see 3.2.24) in a OWRAS (see 3.2.18), or relays signals between a RATR (see 3.2.26) and a RASSR in a TWRAS.

3.2.24 RADIO ALARM SUPERVISING STATION RECEIVER (RASSR) – A radio receiver or receiver/transmitter located at a station, to receive signals from a RARSR (see 3.2.23), RAT (see 3.2.25), or RATR (see 3.2.26) and either annunciates them or interfaces with an automation system that annunciates them.

3.2.25 RADIO ALARM TRANSMITTER (RAT) – A radio transmitter used in an OWRAS (see 3.2.18) located at a protected premises that will transmit signals to at least two independently powered, independently operating, and separately located RARSRs (see 3.2.23). Signals may be transmitted through one RARSR if they are also transmitted directly to the RASSR. A RAT either:

- a) Is integral with a control unit that provides alarm or monitoring functions or
- b) Interfaces with a control unit that provides these functions.

3.2.26 RADIO ALARM TRANSMITTER/RECEIVER (RATR) – A radio transmitter/receiver used in a TWRAS (see 3.2.35) that is located at a protected premises that will transmit and receive signals through at least two independently powered, independently operating, and separately located RARSRs (see 3.2.23) to and from a RASSR (see 3.2.24), or transmits and receives signals directly to and from a RASSR. A RATR either:

- a) Is integral with a control unit that provides alarm or monitoring functions or
- b) Interfaces with a control unit that provides these functions.

3.2.27 RUNNER – A person whose duties are to investigate signals from protected systems that require investigation.

3.2.28 RUNNER OR SERVICEPERSON STATION – A location separate from the central-station, subsidiary station, or service center, where runners or servicepersons are stationed awaiting instructions to respond to signals received at the central-station. Signals are not to be received at a runner or serviceperson station.

3.2.29 RUNNER SERVICE COMPANY – A company that is independent of the central-station which provides runners to respond to signals received by the station as required by this standard.

3.2.30 SERVICE CENTER – A location which may be separate from a central-station that provides required installation, maintenance, repair, and alarm investigator service to systems served by the company. Keys (where required) and maintenance records for protected premises are retained at the service center. Maintenance records are not required to be physically kept at the service center if they can be readily accessed at the service center from another location.

3.2.31 SERVICE VEHICLE – A vehicle that is used to provide required alarm investigator, installation, maintenance, and repair service to systems served by the company.

3.2.32 SERVICEPERSON – A person whose duties are to provide service to protected systems.

3.2.33 SUBSCRIBER – The user of a premise or item protected by a central-station burglar or fire-alarm system. An authorized representative of the user may also be considered a subscriber. For residential monitoring stations, a subscriber would be an occupant of a residence protected by the alarm system.

3.2.34 SUBSIDIARY STATION – A normally unattended physically secure facility linked by communication channels to a central-station or residential monitoring station. Signals from protected properties are transmitted to the subsidiary station and then relayed to the station. If the communication link between the subsidiary station and the station is out of service, the subsidiary station can be manned and operated as a central-station or residential monitoring station.

3.2.35 TWO-WAY RADIO ALARM SYSTEM (TWRAS) – A system in which alarm system signals are transmitted and received through a radio channel between a RATR (see 3.2.26) and a RASSR (see 3.2.24). The signals may or may not be relayed through a RARSR (see 3.2.23).

3.2.36 REPEATER STATION – Equipment, such as radio, which is used to relay signals from protected systems at remote location(s).

3.2.37 UNINTERRUPTIBLE BATTERY SUPPLY (UBS) – A direct current (DC) generator driven by a combustion engine. The DC output is used to provide the DC power required by an uninterruptible power supply (UPS) or by DC powered units.

3.2.38 UNINTERRUPTIBLE POWER SUPPLY (UPS) – Equipment that will continue to provide alternating current (AC) power to a load in the event of failure of the normal AC power source. A UPS may also provide a more constant voltage and frequency supply to the load. When the normal source of AC fails, the UPS is powered by a DC source from batteries, a UBS, or both.

3.3 Definitions common to burglar-alarm

3.3.1 ACKNOWLEDGMENT SIGNAL – An audible and/or visual signal that is sent to the subscriber by the station to notify the subscriber that a signal has been received indicating that the protection system has been properly armed. The acknowledgment signal is to be sent manually or automatically.

3.3.2 CENTRAL-STATION BURGLAR-ALARM COMPANY – A company that is engaged in the business of operating one or more central-stations that provide monitoring, record keeping, and reporting for signals received from central-station burglar-alarm systems. The company shall directly provide for equipment installation, inspection, testing, maintenance and repair service of central-station systems, and runners for alarm investigation service, or it may subcontract for these services. The company may also operate one or more subsidiary stations.

3.3.3 CENTRAL-STATION BURGLAR-ALARM SYSTEM – A system or group of systems consisting of control units, intrusion detection units, contacts, protective wiring, installation wiring, and the like, installed at a protected property in accordance with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681. When the system is armed, detection of an intrusion will cause a signal to be automatically transmitted to a central-station complying with this standard. Arming the system will cause a closing signal to be transmitted and disarming the system will cause an opening signal to be transmitted. The system is to be controlled and operated by a central-station burglar-alarm company.

3.3.4 LINE SECURITY, STANDARD AND ENCRYPTION – Methods of supervising the communication channel used to transmit signals between the protected premises and the central-station or residential monitoring station. This supervision serves to detect compromise attempts on the communication channel that are intended to not cause signals to be annunciated at the station and which would allow entry into the protected premises without initiating a signal at the station.

3.3.5 NORMAL OPERATION SIGNALS – A signal transmitted from the protected premises in accordance with established procedures to indicate to the station that the premises is being closed and armed (or opened and disarmed).

3.3.6 SUBSCRIBER'S BURGLAR-ALARM CONTROL UNIT – Equipment located at the protected premises that controls the protective circuit(s), transmits signals to the central-station or residential monitoring station, and allows the subscriber to arm and disarm the alarm system.

3.4 Definitions common to fire-alarm

3.4.1 CENTRAL-STATION FIRE-ALARM COMPANY – A company that is engaged in the business of operating one or more central-stations that provide monitoring, re-transmission of signals, and associated record keeping and reporting for signals from central-station fire-alarm systems. The station shall directly provide for equipment installation, inspection, testing, maintenance and repair service of central-station systems, runner service, and associated central-station services, or they may subcontract for these services. The company may also operate one or more subsidiary stations.

3.4.2 CENTRAL-STATION FIRE-ALARM SYSTEM – A system or group of systems installed in accordance with the requirements of the National Fire Alarm Code, NFPA 72, in which the operation of circuits and devices are transmitted automatically to, recorded in, maintained by, and supervised from a central-station having trained operators who, upon receipt of a signal, take action as required by NFPA 72. The system is to be controlled and operated by a central-station fire-alarm company.

3.4.3 FIRE-ALARM SERVICE – LOCAL COMPANY – A company that provides protected premises equipment installation, inspection, testing, maintenance and repair service of central-station fire-alarm systems with its own facilities and personnel in accordance with the requirements of the National Fire Alarm Code, NFPA 72. The company subcontracts the monitoring, re-transmission, and associated record keeping and reporting with a central-station. The required runner service is provided by the company or by the central-station.

3.5 Definitions common to residential monitoring stations

3.5.1 RESIDENTIAL MONITORING STATION COMPANY – A company that is engaged in the business of operating one or more residential monitoring stations that provide monitoring, record keeping, and reporting for signals from alarm systems. The company may also operate one or more subsidiary stations.

3.5.2 RESIDENTIAL MONITORING STATION – A building or enclosed area within a building that houses an operating room and equipment used to provide residential monitoring station service to protected properties.

FACILITIES AND EQUIPMENT

4 Building Construction Requirements

4.1 A building that houses a central-station or subsidiary station or residential monitoring station shall comply with one of the following:

- a) All bearing walls, floors, ceilings, columns, beams, girders, trusses, and arches have a one hour fire resistant rating or are constructed of the materials specified in 4.4;
- b) A sprinkler system, supervised by the station, installed in all parts of the building except for the operating room and power room; or
- c) The building is single occupancy and the exterior walls have a one hour fire resistant rating or are constructed of the materials specified in 4.4.

See also Figure 4.1.

4.2 In a multiple occupancy building, the walls, floors and ceilings enclosing the station shall have a one hour fire resistant rating or be constructed of the materials specified in 4.4.

4.3 The fire resistant rating of building construction shall:

- a) Meet the requirements of the local building code or
- b) Be determined by the test methods in the Standard for Fire Tests of Building Construction and Materials, UL 263.

4.4 Walls, floors, ceilings, beams, girders, trusses, and arches that are constructed of masonry or steel, or other materials deemed to have similar combustive characteristics are not required to have a fire resistant rating.

4.5 A building that houses a station shall either have a roof:

- a) With a one-hour, fire-resistant rating;
- b) Constructed of materials specified in 4.4; or
- c) Constructed of a combustible deck with a Class A roof covering complying with the Standard for Materials for Built-Up Roof Coverings, UL 55A, and the Standard for Tests for Fire Resistance of Roof Covering Materials, UL 790.

4.5 revised April 23, 1999.

4.6 Any door in an interior wall that is required to have a fire resistant rating shall have a minimum 3/4-hour fire resistant rating.

4.7 If a repeater station is located in a building:

- a) The building shall comply with the fire resistive requirements of this section or
- b) The repeater station shall be duplicated at separate sites and signals shall be able to be relayed through either site.

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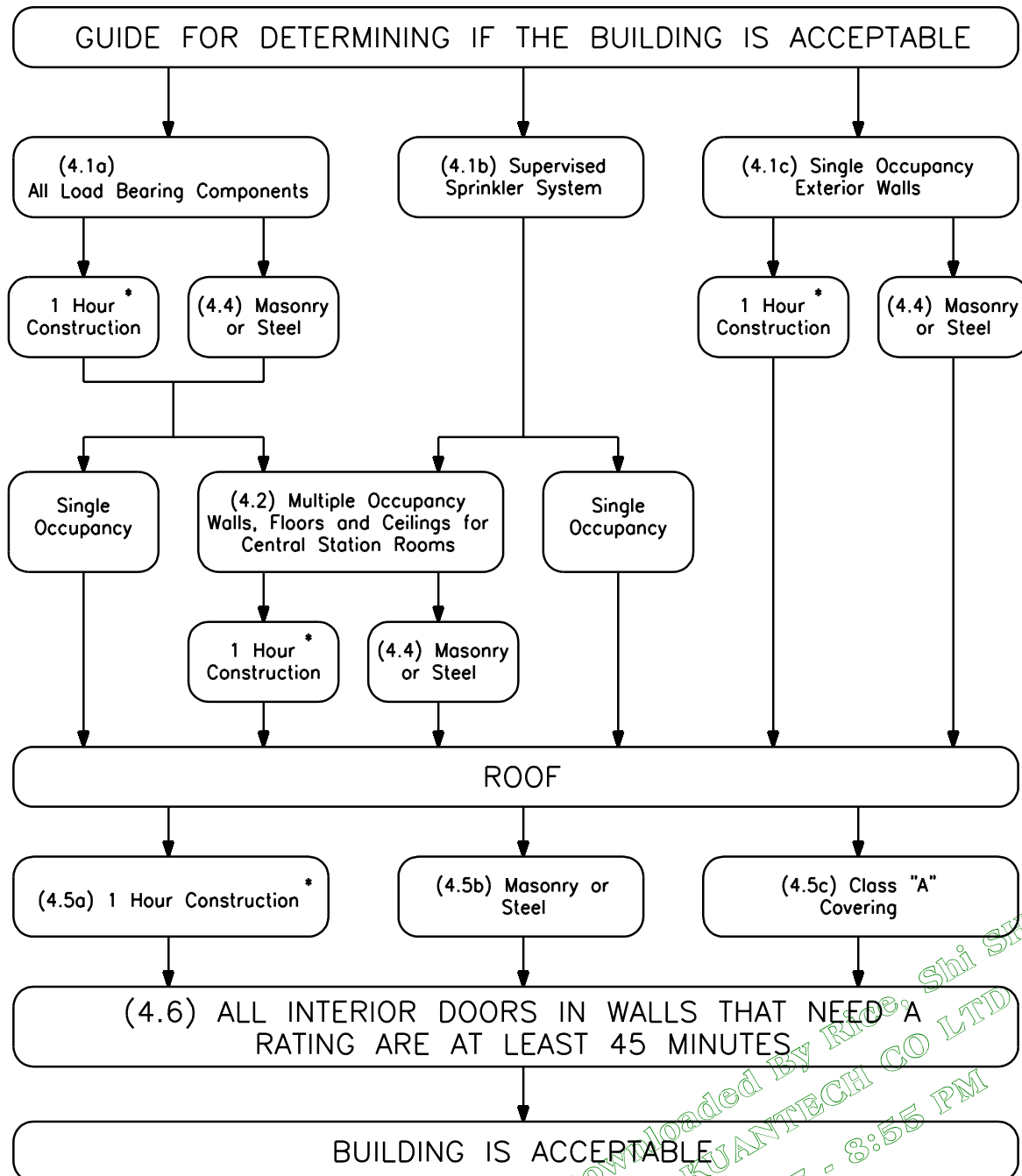
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Figure 4.1
Building construction

Figure 4.1 revised October 1, 1997



S3776

* May be determined by compliance with the local building code, or the Standard for Fire Tests of Building Construction and Materials, UL 263. See 4.3.

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5 Physical Protection

5.1 The operating room of a central, subsidiary, and residential monitoring station, shall be completely enclosed within a boundary that is fixed in place and shall be protected at all times against attack or entrance by unauthorized persons. Walls enclosing an operating room shall extend from a fixed-in-place floor deck to a fixed-in-place ceiling. If a suspended ceiling is used, and the wall construction above the suspended ceiling is not required to serve as a fire stop, the portion of the wall above the suspended ceiling may be constructed of wire-mesh screening constructed of at least 0.053 inch (1.35 mm) expanded sheet steel or No. 10 AWG (0.102 inch diameter) (5.26 mm²) steel wire with openings not greater than 2 inches (51 mm).

Exception: Wall construction above a suspended ceiling is not required provided that solid walls, floor, and ceiling or roof enclose the entire alarm company quarters and the alarm company has controlled access throughout their quarters and there is a burglar-alarm system installed in areas surrounding the operating room that become unoccupied outside of normal business hours. The burglar-alarm system shall comply with Extent No. 3 in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, shall be armed when those areas are unoccupied, and shall be monitored in the operating room.

5.1 effective January 1, 1999

5.2 Entrances into the operating room shall be kept locked at all times and arranged so that positive identification can be made by vision and voice of any person seeking admittance. If the person is unknown to the personnel, they shall be identified by an identification card or the like. If closed circuit television is used, a second means of manual visual identification shall be provided.

5.3 A door into the operating room of a station shall be one of the following:

- a) A recognized fire-resistant door and door frame;
- b) A solid or hollow metal door; or
- c) A solid wood, or solid wood core door with wood, plastic, or composition cladding a minimum of 1-1/2 inches (38 mm) thick.

5.4 The entry door shall be equipped with an automatic door closer without a hold open feature, and a locking means that cannot be changed to an unlocked condition.

5.5 If the door is locked with an electromagnetic lock, or similar device that requires electrical power to maintain the locking of the door, standby power or a backup mechanical lock shall be provided to maintain the locking of the door. The standby power shall be provided from the secondary power supply (see 9.5).

5.5 effective January 1, 1999

5.6 The operating room shall be arranged so that a person that is outside of the operating room in an area that is controlled by the station, cannot view the signal processing equipment so as to obtain information about an alarm system served by the station.

5.7 Any transparent window or panel that will provide a view of the operating room from a location that is not under the control of the station shall be made translucent or opaque by painting, screening, blinds, curtains, drapes, or similar coverings. Mirrored, tinted and one-way glass shall not be used for that purpose.

5.8 Any exterior opening, other than a door, that leads into the operating room from an area that is not controlled by the station, and which is accessible as defined in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, shall be covered with either:

- a) Permanently-installed solid bars constructed of iron or steel at least 1/2 inch (12.7 mm) diameter, or rectangular with a minimum cross-section area of 0.25 square inch (40 mm²) with the minimum dimension 1/4 inch (6.4 mm). The space between bars shall be 4 inches (102 mm) or less and the space between supporting cross pieces shall be 18 inches (457 mm) or less. The supporting cross pieces shall be of the same material and dimension as the bars or larger;
- b) Wire-mesh screening constructed of at least 0.053 inch (1.35 mm) expanded sheet steel or No. 10 AWG (0.102 inch diameter) (5.26 mm²) steel wire with openings not greater than 2 inches (51 mm);
- c) Glazing complying with the Standard for Burglary Resisting Glazing Material, UL 972; or
- d) Glazing complying with the Standard for Bullet-Resisting Equipment, UL 752.

5.8 revised April 23, 1999

5.9 A subsidiary station repeater station shall be equipped with a burglar-alarm and automatic fire-alarm system connected to the central-station or residential monitoring station. The automatic fire-alarm system shall comply with the requirements in the National Fire Alarm Code, NFPA 72. The burglar-alarm system shall comply with Extent No. 3 in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, and shall be armed when the station is unattended. See 11.7. A repeater station is not required to be equipped with a burglar-alarm and automatic fire-alarm system if the repeater station is duplicated at separate sites and signals are able to be relayed through either site.

6 Fire Protection

6.1 Portable fire extinguishers

6.1.1 Each station operating room shall be equipped with a minimum of two portable fire extinguishers rated 2-A or greater and two portable fire extinguishers rated 10-B:C or greater. Two multipurpose fire extinguishers rated 2-A:10-B:C will satisfy this requirement.

6.1.2 Each power room, battery room, and engine-driven generator room or enclosure shall be equipped with a minimum of one portable fire extinguisher rated 2-A or greater and one portable fire extinguisher rated 10-B:C or greater. One multipurpose fire extinguisher rated 2-A:10-B:C will satisfy this requirement.

6.1.3 Portable fire extinguishers shall comply with the Standards for 2-1/2-Gallon Stored-Pressure, Water-Type Fire Extinguishers, UL 626; Carbon-Dioxide Fire Extinguishers, UL 154; Dry Chemical Fire Extinguishers, UL 299; or Halogenated Agent Fire Extinguishers, UL 1093.

6.1.4 Fire extinguishers shall be located where they will be readily accessible and immediately available. A fire extinguisher intended to be used on electronic equipment, such as an automation system, shall be of the carbon dioxide or halogenated agent type and shall be located next to the automation system equipment. If the automation system equipment is in a separate room, the extinguisher shall be located outside of the room, within 3 feet (0.9 m) of the door. A separate room for automation equipment shall be provided with an automatic smoke and fire detection system with annunciation in the operating room.

6.1.5 A fire extinguisher shall be installed on the hanger or in the bracket supplied, or placed in a cabinet or a wall recess. A hanger or bracket shall be securely anchored to the mounting surface. If a cabinet is used, the door shall not be locked.

6.1.6 Fire extinguishers shall be maintained in accordance with the instructions marked on each extinguisher. Fire extinguishers shall be inspected once a year and the date of the inspection recorded in ink on a tag attached to the extinguisher.

6.1.7 The fire extinguisher for a power room, battery room, or engine-driven generator shall be located inside or just outside of the door to the room, within 3 feet (0.9 m). If the engine-driven generator is enclosed as specified in 9.13.2 or 9.13.6, the extinguisher shall be located within 10 feet (3.05 m) of the enclosure. If the enclosure for the engine-driven generator is provided with a personnel door or gate, the extinguisher shall be located inside or just outside the door or gate, within 3 feet.

6.2 Fire suppression system

6.2.1 If the automation system equipment is located in a separate room that is not normally occupied by personnel, and it is protected by a fire suppression system using a carbon-dioxide or halogenated or clean agent extinguishing agent, the discharge of the extinguishing agent shall either be automatic and an audible signal shall announce that it has been discharged, or the discharge of the extinguishing agent shall be under manual control. If under manual control, the automation system room shall be equipped with an automatic fire-alarm system that complies with the National Fire Alarm Code, NFPA 72, with annunciation in the operating room. Manual discharge is not acceptable in a subsidiary station.

6.2.1 effective January 1, 1999

6.3 Water sheds

6.3.1 A water shed shall be installed over any equipment that is sensitive to water damage if there is a possibility of water damage from overhead. The water shed may be permanent, or may be a movable waterproof cover or shield installed next to the equipment so that it can be immediately positioned by one person to protect the equipment. A movable waterproof cover shall only be used in a manned station.

6.4 Repeater station fire protection

6.4.1 A repeater station need not be provided with fire protection equipment, unless located in a building. A repeater station in a building is not required to be provided with fire protection equipment if it is duplicated at separate sites and signals are able to be relayed through either site.

6.5 Automatic fire-alarm system

6.5.1 A station shall have an automatic fire-alarm system installed in all areas not continuously occupied by alarm service company personnel, but which are under its control. The system shall comply with the National Fire Alarm Code, NFPA 72, and shall notify the operators of any trouble or fire condition that is detected.

6.5.1 effective January 1, 1999

7 Standby Lighting

7.1 Fixed standby lighting that is independent of the power source normally used for lighting, and which can be placed into service immediately, shall be provided in:

- a) The operating room of a station;
- b) Each runner and serviceperson station; and

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- c) An automation system room or equipment room that is separated from the operating room.

7.1 effective January 1, 1999

7.2 Fixed or portable standby lighting that is independent of the power source normally used for lighting, and which can be placed into service immediately, shall be provided:

- a) In a power room and
- b) For an engine-driven generator(s).

7.3 Independent battery-powered standby lighting units shall comply with the Standard for Emergency Lighting and Power Equipment, UL 924.

7.4 The standby lighting shall be tested for a continuous 5-minute period once per month. A record shall be kept of the test.

7.4 effective January 1, 1999

8 Clocks

8.1 The operating room shall be equipped with:

- a) At least one clock and date-time stamp that includes the year or
- b) Two or more date-time stamps that include the year and which visually display the time.

The year may be indicated with the last digit of the year. Each date-time stamp powered by 120-volt AC shall comply with the Standard for Time-Indicating and -Recording Appliances, UL 863. Each clock powered by 120-volt AC shall comply with UL 863 or with the Standard for Household Electric Clocks, UL 826. Except in a subsidiary station, all clocks and time-stamps shall be checked daily according to standard local time and, if necessary, reset.

8.2 The clocks and date-time stamps in a subsidiary station shall be checked monthly according to standard local time and, if necessary, reset. See 8.3.

8.3 When primary power has been restored after a power failure, all clocks, time-stamps and other time keeping and indicating equipment powered by AC are to be checked against and, if necessary, reset to standard local time.

9 Power Supply

9.1 General

9.1.1 Electrical power for signaling equipment used in a station shall be provided by methods complying with 9.1.2 – 9.15.5.

9.1.2 Operation of equipment from a secondary power source shall be indicated in the operating room when the switch over to the secondary source is made.

9.2 Installation

9.2.1 All power supply equipment (such as batteries, battery-chargers, overcurrent protection, rectifiers, switching facilities, transformers, voltage regulators, power conditioners, emergency generating equipment, uninterruptible power supplies (UPS), engine-driven generator transfer switches, and the like) and wiring shall comply with, and be installed in accordance with, the requirements of the National Electrical Code, ANSI/NFPA 70, as required by the local authority having jurisdiction, for such equipment.

9.3 Source

9.3.1 Two sources of power shall be provided for operation of the signaling equipment, and other associated equipment necessary for the ongoing operation of the station under all conditions.

9.4 Primary power supply

9.4.1 One primary power supply shall be provided. The primary power supply shall be used to operate the system under any condition except in case of its failure. The supply shall have the capacity for the intended service, and shall consist of:

- a) Commercial light and power service or
- b) A permanently-installed, engine-driven generator.

9.5 Secondary power supply

9.5.1 A secondary (standby) supply shall be provided to supply energy to all of the equipment necessary for the operation of the station in the event of failure of the primary power supply. The secondary power supply shall consist of either:

- a) A storage battery or batteries of sufficient capacity to operate the system for a 24-hour period;
- b) A permanently-installed, automatic-starting, engine-driven generator having sufficient capacity to power the system and a storage battery or batteries with a 4-hour capacity; or
- c) Two or more permanently installed engine-driven generators. With the largest capacity engine-driven generator out of service, the remaining engine-driven generator(s) shall be capable of supplying power to operate the system. Except for the conditions specified in 9.6.1, a standby battery is not required. Only one of the generators shall be automatic-starting.

Exception: More than one of the engine-driven generators can be automatic starting if:

- a) They are supplying separate loads or
- b) The starting systems are arranged so that if the primary engine-driven generator does not start, the secondary engine-driven will start.

9.5.1 effective upon publication except for item (b) which is effective January 1, 1999

9.5.2 Provision shall be made to restore equipment used to provide secondary power to service within 72 hours by repair of the equipment or by its permanent or temporary replacement.

9.6 Continuity of power supply

9.6.1 Rechargeable batteries of sufficient capacity to operate the system under maximum normal load for 15 minutes shall be provided if signals could be lost due to the transfer of power between the primary and secondary power supply, or if signal receiving units will require more than 30 seconds to reset. The rechargeable batteries shall assume the load in such a manner that no signals will be lost if the secondary power is supplied in accordance with:

- a) 9.5.1 (a) or (b) and the transfer is made manually or
- b) 9.5.1(c).

9.6.2 If signals will not be lost due to the transfer of power between the primary and secondary power supply, the transfer shall be accomplished, either manually or automatically, within 30 seconds of loss of primary power. If more than 30 seconds is required, standby power in accordance with 9.6.1 shall be provided.

9.6.3 An uninterruptible power supply (UPS) with sufficient battery capacity to operate equipment for at least 15 minutes, or until the secondary power supply is capable of supplying the UPS input power, shall be provided for computer equipment and other AC powered equipment used to receive or process signals, or both, if the:

- a) Status of signals previously received will be lost or confused upon loss of power or
- b) Equipment cannot be restored to full operation within 30 seconds of loss of primary power.

9.6.4 An automation system used to process signals shall be powered through a UPS with sufficient battery capacity to operate the automation system at maximum load for at least 15 minutes or until the secondary power supply is capable of supplying the UPS input power.

9.6.5 When secondary power is being provided by the engine-driven generator(s) during a primary power failure, and primary power is restored, the system shall not be returned to primary power until the primary power has been on for an uninterrupted period of at least 3 minutes. Restoration to primary power shall be by automatic or manual means.

9.6.5 effective January 1, 1999

9.7 Storage batteries

9.7.1 A storage battery shall be of the long-service, stationary-type or gelled electrolyte-type and shall be located or enclosed so that signaling equipment cannot be affected by battery gases.

9.7.2 All cells shall be insulated against grounds and crosses, and shall be mounted so as to not be subject to mechanical damage. A rack, frame or cabinet used to support a battery shall be protected against the corrosive effects of battery gases and liquids.

9.7.3 Battery cells shall be sealed to prevent the venting of gas or the power room or enclosure that houses batteries shall be vented to the outside atmosphere.

9.7.4 Batteries shall be marked with the date that they are installed and on which they are to be replaced based on the life expectancy indicated by the manufacturer's data. Batteries shall be replaced sooner if tests indicate that they should be replaced.

9.7.4 effective January 1, 1999

9.8 Overcurrent protection for external batteries

9.8.1 Batteries that are external to the equipment that they power shall be protected by enclosed fuses or circuit breakers in the main discharging leads. The overcurrent protection shall be installed as close to the battery terminals as practical.

9.8.2 The current rating of the fuse or circuit breaker shall not be less than 130 percent of the current rating of the charging source. The maximum rating shall not be more than 250 percent of the maximum normal operating load or 200 percent of the current rating of the charging source, whichever is greater.

9.8.3 The overcurrent protection provided as a part of the equipment shall be used if it is an integral part of the equipment.

9.8.4 The rating of a fuse or circuit breaker used in the grounded side of a battery, if provided, shall not be less than twice the rating of the fuse or circuit breaker in the ungrounded side.

Exception: The rating of the circuit breaker in the grounded side can be less than twice the rating of the circuit breaker in the ungrounded side, but not less than that rating, if circuit breakers are used in both the ungrounded and grounded side, and they are mechanically linked (ganged) so that both will be opened if either one is operated.

9.8.5 At least two spare fuses and one spare circuit breaker for every rating that is in use shall be available at the station for replacement use.

9.8.5 effective January 1, 1999

9.9 Charging method

9.9.1 Provisions shall be made for charging a battery so that it will be protected from damage due to an excessive rate of charge or to the reversal or interruption of the supply current.

9.9.2 Spraying of the electrolyte shall be prevented while the battery is being charged by its charging source.

9.10 Trickle- or float-charged batteries

9.10.1 Battery chargers or DC power supplies of sufficient capacity shall be provided to supply power to all direct current circuits without overloading the charging equipment.

9.10.2 A storage battery of sufficient capacity shall be connected across the line in such a manner that would normally charge the battery, or it shall be in a separate standby condition with an automatic switching means such that the battery would be transferred to operate the system upon failure of the primary power supply. Working circuits shall not be affected by the switchover to standby battery.

9.10.3 Storage batteries that are intended to supply 24 hours of standby power shall be tested monthly by a 30-minute, normal operating load discharge test. The average voltage per cell shall not be permitted to drop below the manufacturer's recommended level.

9.10.4 The discharge test for a battery intended to supply 4 hours or 15 minutes of standby power shall be for a duration of 5 minutes.

9.10.5 If the DC source used to operate the system is also used to maintain the charge for the battery, it shall be capable of providing the maximum load with the battery fully discharged.

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9.10.6 The charging current for either a trickle-or float-charged battery shall be such that a completely discharged battery is restored to the required operating charge within:

- a) 48 hours for a battery intended to supply 24 hours of standby power or
- b) 24 hours for a battery intended to supply 4 hours or 15 minutes of standby power.

9.11 Battery chargers and DC power supplies

9.11.1 Battery chargers and DC power supplies shall comply with the Standard for Power Supplies for Fire-Protective Signaling Systems, UL 1481; Industrial Battery Chargers, UL 1564; or Power Units Other Than Class 2, UL 1012.

Exception: Does not apply to battery chargers used to maintain the starting battery for an engine driven generator. See 9.12.10.

9.11.1 revised April 23, 1999

9.11.2 Preventive maintenance shall be performed on a battery charger or DC power supply as specified by the manufacturer. The maintenance may be provided under a service contract.

9.11.2 effective January 1, 1999

9.12 Stationary, engine-driven generators

9.12.1 An engine-driven generator shall be used only if an operator trained in its use is on duty at all times, unless the requirements of 9.6.1 – 9.6.4 are met.

9.12.2 The installation of a stationary combustion engine shall comply with the requirements of the Standard for Stationary Combustion Engines and Gas Turbines, NFPA 37, as applied by the local authority having jurisdiction.

9.12.3 There shall be an indication in the operating room when the engine-driven generator is operating. If there is more than one engine-driven generator, there shall be an indication of operation for each.

9.12.3 effective January 1, 1999

9.12.4 An engine-driven generator shall be located so that the noise, vibration, fumes, heat and the like, of its operation will not interfere with the handling of signals and other duties in the operating room and other functions of the station.

9.12.4 effective January 1, 1999

9.12.5 Fuel shall be stored in outside underground tanks whenever possible and gravity feed of fuel shall not be used.

9.12.6 Sufficient fuel shall be maintained so as to provide for 12 hours of operation at full-load if a reliable source of supply is available at any time on 2 hours notice. If a source of supply is not reliable or readily available, or if special arrangements must be made for refueling, a supply sufficient for 24 hours of operation must be maintained.

Exception: Storage of fuel is not required for systems using natural or manufactured gas supplied through utility mains.

9.12.7 If gasoline fuel is used, which deteriorates with age, it shall be supplied from a "working" tank that is frequently replenished, or other means shall be provided to ensure that the gasoline will always be fresh.

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9.12.8 The units shall be of sufficient capacity to be able to operate the system under the maximum normal load conditions in addition to all other demands, such as standby lighting.

9.12.9 The units shall have sufficient capacity to be able to operate air conditioning, heating, ventilation, and the like, if these functions are essential to the operation of the station.

9.12.10 A separate storage battery and automatic float charger shall be provided for starting the engine-driven generator and shall not be used for any other purpose. The charger shall comply with the Standard for Battery Chargers for Charging Engine Starting Batteries, UL 1236.

9.12.10 effective January 1, 1999

9.12.11 Each engine-driven generator shall be operated weekly under load by disconnecting the normal supply to the system for a continuous period of at least 30 minutes. This operation shall be performed at a definite scheduled time each week with a record retained of the test and results.

Exception: An engine-driven generator at a subsidiary station may be tested monthly. See 11.10.

9.12.11 effective January 1, 1999

9.12.12 Preventative maintenance shall be performed on an engine-driven generator as specified by the manufacturer. The maintenance may be provided under a service contract.

9.12.12 effective January 1, 1999

9.12.13 The station shall:

- a) Maintain a current list of all the equipment and facilities that will be powered by the engine-driven generator(s) and their loads or
- b) Determine the load by operating the engine-driven generator(s) with all the intended equipment and facilities powered from it. See 9.12.11.

9.12.13 effective January 1, 1999

9.13 Security

9.13.1 Engine-driven generators, power supplies, or batteries that are located in an area of the building not under supervision by station personnel, shall be located in a room that is locked and has all movable openings supervised by the station with contacts or the equivalent. Openings in the walls, ceiling, or floor that exceed manhole size (96 square inches (619 cm²) with the smallest dimension exceeding 6 inches (152 mm) shall be protected with bars or screening as specified in 9.13.2 (a) or (b).

9.13.2 An engine-driven generator, power supply, or battery located in an area of the building that cannot be locked shall be enclosed by one of the following means:

- a) A mesh constructed either of expanded sheet steel at least 0.053 inch (1.4 mm) thick, or No. 10 AWG (0.102 inch diameter) (5.3 mm²) steel wire, or an equivalent material. Any opening in the mesh shall not be wider than 2 inches (51 mm) when measured in any direction.
- b) A sheet metal enclosure using either steel or aluminum. Sheet steel shall have a minimum thickness of 0.032 inches (0.81 mm) and shall be provided with corrosion protection by painting, plating, or the equivalent. Sheet aluminum shall have a minimum thickness of 0.045 inch (1.14 mm). All removable panels shall be secured by lock and supervised with contacts by the station.

9.13.3 Openings in the sheet metal enclosure described in 9.13.2(b) intended for air flow and the like shall be protected with a mesh complying with the requirements in 9.13.2(a).

9.13.4 Gaps in the perimeter of the mesh barrier shall not exceed 6 inches (152 mm). The space between the barrier and wall, floor, or ceiling shall not exceed 6 inches. The spacing to the ceiling may exceed 6 inches if the mesh barrier extends to a height of 8 feet (2.44 m) and is topped with three horizontal strands of barbed wire or razor ribbon coils, or if the equipment is covered by the mesh.

9.13.5 The gates(s) or door(s) into the enclosure described in 9.13.2 shall be locked and supervised by the station with contacts.

9.13.6 An engine-driven generator located outdoors shall comply with the requirements specified in 9.13.2 – 9.13.5. If a mesh barrier is used, it shall extend to a height of at least 8 feet (2.44 m) and shall be topped by three horizontal strands of barbed wire or razor ribbon coils; otherwise the equipment shall be covered by the mesh, or the equivalent. The opening between the bottom edge of the mesh and a surface of concrete or asphalt, shall not exceed 6 inches (152 mm). If the surface below the bottom edge of the mesh is not concrete or asphalt, there shall be no opening between the bottom edge of the mesh and the surface.

9.13.7 The location of shut-off valves, for natural or manufactured gas supplied through utility mains to fuel an engine-driven generator, inside the building housing the station or within 150 feet (45.7 m) of the building, shall be known to the operators. The operators shall have a procedure for checking the valves in case of fuel shut-off. The valves may be supervised by the station.

9.14 Uninterruptible power supply (UPS) units

9.14.1 When equipment used to receive and process signals in a station is required to have an uninterrupted source of alternating current (AC), a UPS shall be provided. A UPS shall comply with the Standards for Power Supplies for Fire-Protective Signaling Systems, UL 1481, or Uninterruptible Power Supply Equipment, UL 1778.

9.14.1 revised April 23, 1999

9.14.2 In order to perform maintenance and repair service, a means for disconnecting the input and output to a UPS shall be provided. One of the following methods shall be employed:

- a) A manual bypass switch that will not interrupt continuity of power to the UPS load when operated;
- b) The UPS and any equipment that constitutes the UPS's load shall be duplicated and connected to a separate branch circuit supply. Any automation equipment shall be capable of being brought into service within 5-1/2 minutes; or
- c) Any other method that will allow a UPS to be taken out of service without interrupting power to the load that it supplies.

9.14.3 A UPS that is intended to supply 24 hours of standby power shall be tested monthly by using it to supply its intended load for 30 minutes. A record shall be kept of the test and the results.

9.14.4 A UPS that is intended to supply 4 hours or 15 minutes of standby power shall be tested monthly by using it to supply its intended load for 5 minutes. A record shall be kept of the test and the results.

9.14.5 Preventive maintenance shall be performed on a UPS as specified by the manufacturer. The maintenance may be provided under a maintenance contract.

9.14.5 effective January 1, 1999

9.14.6 The station shall:

- a) Maintain a current list of all the equipment and facilities that will be powered by the UPS and their loads or
- b) Determine the load by operating the UPS with all the intended equipment and facilities powered from it. See 9.14.4.

9.14.6 effective January 1, 1999

9.15 Uninterruptible battery supply (UBS) units

9.15.1 A UBS shall be installed and operated as an engine-driven generator. See 9.12 and 9.13.

9.15.2 There shall be an indication in the operating room that the UBS is operating. If there is more than one UBS, there shall be an indication of operation for each.

9.15.2 effective January 1, 1999

9.15.3 A UBS shall be operated weekly under load for a continuous period of at least 30 minutes. This operation shall be performed at a definite scheduled time each week with a record retained of the test and results.

9.15.4 Preventive maintenance shall be performed on a UBS as specified by the manufacturer. The maintenance may be provided under a service contract.

9.15.4 effective January 1, 1999

9.15.5 The station shall:

- a) Maintain a current list of all the equipment and facilities that will be powered by the UBS and their loads or
- b) Determine the load by operating the UBS with all the intended equipment and facilities powered from it. See 9.15.3.

9.15.5 effective January 1, 1999

10 Cable System

10.1 General

10.1.1 In general, for leased or other wires, standard telephone operating practice shall be accepted. For requirements pertaining to protectors on each circuit, aerial or underground, refer to the National Electrical Code, ANSI/NFPA 70, Article 800, as applied by the local authority having jurisdiction.

10.1.2 The conductors carrying signaling and communication circuits into the station shall be protected against fire, mechanical damage, and attack by the methods outlined in 10.2.1 – 10.4.5.

10.2 Underground entrance

10.2.1 Underground conductors entering the building housing the station shall be grouped in cables rated for underground service and shall have mechanical protection where necessary to protect against fire and other damage. The mechanical protection shall be provided by rigid metal electrical conduit, electrical metallic tubing, or masonry encasement, or shall be at least 18 inches (0.45 m) below the grade surface or under a paved street or sidewalk (concrete or asphalt). The masonry encasement shall be at least 3 inches (76 mm) thick.

10.2.2 Telephone terminal boards, cables, and the like, shall be placed and run through locations which are not exposed to risk of fire or flammable material in the vicinity. Telephone rooms shall not be used for the storage of combustible materials.

10.2.3 Manholes, covered cable vaults, and pedestal enclosures within 150 feet (45.7 m) of the building housing the station, and which provide access to the conductors entering the station, shall be mechanically secured to restrict access or shall be electrically supervised by the station. The means used to mechanically secure the manhole cover, cable vault cover, or pedestal enclosure shall require a lock or special tool to release.

10.3 Overhead entrance

10.3.1 Overhead conductors entering the building housing the station shall be at least 18 feet (5.5 m) above grade within 150 feet (45.7 m) of the building. Conductors that are less than 18 feet above grade within 150 feet of the building housing the station, shall be provided with mechanical protection by rigid metal electrical conduit or electrical metallic tubing. See 10.3.2.

10.3.2 Cables routed from overhead to underground on a pole or down the side of a building within 150 feet (45.7 m) of the building housing the station, shall be protected by rigid metal electrical conduit, electrical metallic tubing, or a sheet steel guard.

10.4 Conductors inside the building

10.4.1 Conductors that are not in an area under the control of the station shall not be marked to identify them as serving the station.

10.4.2 Conductors carrying signaling and communication circuits located inside a multiple-occupancy building housing the station, but outside of the part of the building housing the station itself shall be provided with electrical or mechanical protection.

10.4.3 Electrical protection shall consist of:

- a) A protective circuit surrounding the conductors;
- b) Volumetric-radiation motion detection or the equivalent, in the area of the conductors adjusted to comply with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681;
- c) Complete protection of all moveable openings leading into areas containing the conductors in accordance with the requirements in UL 681; or
- d) Protection of each area through which the conductors pass, in accordance with the requirements for Extent No. 3 in UL 681.

10.4.4 Conductors that are concealed by the building structure do not require electrical protection or additional mechanical protection if building structure must be damaged or destroyed to gain access to the conductors. This does not apply to lift-out drop ceiling panels or removable wall or floor panels.

10.4.5 All electrical protection shall be monitored by the station.

10.5 Antenna cable

10.5.1 For requirements pertaining to protectors on each antenna circuit, refer to the National Electrical Code, ANSI/NFPA 70, Article 820, as applied by the local authority having jurisdiction.

10.5.1 effective January 1, 1999

10.5.2 An antenna cable connecting a radio antenna to radio receiving and/or transmitting equipment in a station shall be protected against fire, mechanical damage, and attack by the methods outlined in 10.5.3 – 10.5.9.

10.5.2 effective January 1, 1999

10.5.3 The base of an antenna tower or mast at a central station shall be protected by a barrier constructed of a mesh of either expanded sheet steel at least 0.053 inch (1.4 mm) thick, or No. 10 AWG (0.102 inch diameter) (5.3 mm²) steel wire, or an equivalent material, extending to a height of at least 8 feet (2.44 m), topped by three horizontal strands of barbed wire or razor ribbon coils. Any opening in the mesh of the barrier shall not be wider than 2 inches (51 mm) when measured in any direction. The opening between the bottom edge of the barrier and a surface of concrete or asphalt, shall not exceed 6 inches (152 mm). If the surface below the bottom edge of the barrier is not concrete or asphalt, there shall be no opening between the bottom edge of the barrier and the surface.

10.5.3 effective January 1, 1999

10.5.4 An antenna cable routed down a pole or the side of a building within 150 feet (45.7 m) of the building housing the station shall be protected by rigid metal electrical conduit, electrical metallic tubing or a sheet steel guard.

10.5.4 effective January 1, 1999

10.5.5 An antenna cable that is not in an area under the control of the station shall not be marked to identify it as serving the station.

10.5.5 effective January 1, 1999

10.5.6 An antenna cable inside a multiple-occupancy building housing the station, and which is outside of the part of the building housing the station itself shall be provided with electrical or mechanical protection.

10.5.6 effective January 1, 1999

10.5.7 Electrical protection shall consist of:

- a) A protective circuit surrounding the cable;
- b) Volumetric-radiation motion detection or the equivalent, in the area of the conductors, adjusted to comply with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681;
- c) Complete protection of all moveable openings leading into areas containing the cable in accordance with the requirements in UL 681; or

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d) Protection of each area through which the cable passes, in accordance with the requirements for Extent No. 3 in UL 681.

10.5.7 effective January 1, 1999

10.5.8 An antenna cable that is concealed by the building structure does not require electrical protection or additional mechanical protection, if the building structure must be damaged or destroyed to gain access to the cable. This does not apply to lift-out drop ceiling panels or removable wall or floor panels.

10.5.8 effective January 1, 1999

10.5.9 All electrical protection shall be monitored by the station.

10.5.9 effective January 1, 1999

11 Subsidiary Stations

11.1 A subsidiary station shall be connected to a central-station or residential monitoring station by:

a) Two or more supervised channels, any one of which can be used to operate the system or

b) By a supervised channel and a backup channel that is made through the telephone company's dial-up network.

The connection through the dial-up channel shall be tested weekly by operating through the dial-up channel for 5 minutes or more. A record shall be made of the test.

11.1 effective January 1, 1999

11.2 The connection between the receiving units at a subsidiary station and the equipment transmitting signals to the manned central station or residential monitoring station, shall be supervised so that a trouble signal is transmitted to the manned station if the connection is faulted.

11.2 effective January 1, 1999

11.3 The switch-over to the standby channel, either supervised or dial-up, shall be made within 90 seconds after the loss of the primary channel.

11.3 effective January 1, 1999

11.4 If all the channels between a subsidiary station and manned station are lost, any signals received by the subsidiary station shall be automatically recorded or stored until the subsidiary station can be manned or the channels restored.

11.5 A subsidiary station shall be equipped so that it can be manned and operated as a central-station or a residential monitoring station.

11.6 A subsidiary station shall be manned by qualified operating personnel within one hour after the central-station or residential monitoring station has determined that all contact has been lost and signals cannot be received from the subsidiary station.

a) Once manning has occurred they shall catch-up to handling current signals in "real-time" within one hour of their arrival.

b) Only alarms and trouble signals shall be required to be handled during the manned period.

c) Signals shall be handled on a "first in-first out" basis, including the "catch-up period." See (a).

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- d) Signal handling shall be recorded and available as indicated in Records, Sections 21 and 37.
- e) Database availability shall be assured through local physical files or no less than two distinct sources that are immediately available, organized, and not more than one week old.
- f) Primary communication with persons outside the subsidiary station shall be through the use of wireless communications (see 11.11) with no less than one channel per-work position. The method employed shall also support continued manual operation for 24 hours.
- g) The alarm company shall specify the number of positions required for "manning" of the subsidiary station based upon a documented ratio of the number of accounts whose systems report therein to the number of operators required. (Each position shall be equipped with a PSTN telephone.)

Revised 11.6 effective December 31, 2008

11.7 Equipment used in a subsidiary station for burglar-alarm service shall comply with the requirements in the Standards for Central-Station Burglar-Alarm Units, UL 1610, or Digital Alarm Communicator System Units, UL 1635. Equipment used in a subsidiary station for fire-alarm service shall comply with the requirements in the Standard for Control Units for Fire Protective Signaling Systems, UL 864.

11.8 A subsidiary station shall be protected by a burglar-alarm and an automatic fire-alarm system whose signals are transmitted to the station that it is connected to. The automatic fire-alarm system shall comply with the National Fire Alarm Code, NFPA 72. The burglar-alarm system shall comply with the requirements for Extent No. 3 in the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, and shall be armed when the station is unattended. See 5.9.

11.8 effective January 1, 1999

11.9 The power and environmental control systems of a subsidiary station shall be monitored by the station to which it is connected.

Revised 11.9 effective December 31, 2008

11.10 A subsidiary station shall be inspected once a month by central-station or residential monitoring station personnel or their authorized agents to verify the operation of all equipment, telephones, battery conditions and, if used, engine-driven generators.

Revised 11.10 effective December 31, 2008

11.11 A subsidiary station shall be equipped with a cellular telephone or an equivalent means of voice communication that is independent of the telephone cable that is connected between the subsidiary station and the serving wire center of the telephone company, or personnel who can man the subsidiary station shall be so equipped.

11.11 effective January 1, 1999

11.12 There shall be a written plan of action for the restoration of service by a subsidiary station. The plan shall include the following.

- a) Foreseeable disasters: Possible natural and man-made disaster threats, national and local, that could affect the station.
- b) Emergency names list: A notification list that includes the names and the telephone numbers at work, home, vacation home, and the like, and home addresses of management, technical, operators, runners, and other relevant personnel.

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- c) Equipment vendor contacts: The 24-hour telephone and fax numbers of the vendors, technical assistance providers, and maintenance contractors of the equipment used in the station.
- d) Municipal agency contacts: Emergency telephone numbers for local municipal agencies, such as the fire and police departments, to be called for help.
- e) Utility contacts: Formalized emergency procedures and 24-hour contact names and telephone numbers of the utility and telephone companies serving the station.
- f) If an engine-driven generator(s) is used that requires on-site fuel storage, there shall be a 24-hours a day contact and telephone number for a source of fuel resupply.
- g) Relocation site: If a relocation site is provided for, information on the location of the site, how to get there, how to put the site into operation, and 24-hour emergency management contact names and telephone numbers.
- h) The processes, people, and who is responsible for what, in a form easily understandable by those who are required to perform the manual manning procedure(s).

Revised 11.12 effective December 31, 2008

11.13 Supervisory personnel and designated employees shall be made familiar with the plan and shall know the location of a copy of the plan that is kept at the station or in another location, immediately available, which is clearly noted in the subsidiary station for all to see. The implementation of the plan shall be practiced annually to assure that all personnel know their responsibilities in case of an emergency, thus providing the opportunity to evaluate the current plan, making any changes that are recognized as needed.

Revised 11.13 effective December 31, 2008

11.14 The plan shall be reviewed and updated every six months and current copies shall be kept in designated and accessible locations.

11.14 effective January 1, 1999

12 Equipment

12.1 Equipment used in a station shall comply with the requirements for that equipment.

12.2 Equipment shall be mounted or installed where it will be least subjected to vibration, jarring, and conditions leading to mechanical damage.

12.3 Wiring to protective equipment shall be connected through distribution panels with marked terminals to facilitate rapid transfer of lines from defective units to reserve units when necessary.

12.4 For direct-wire and code-transmitter receiving units, each station shall have two or more audible signal units which may be disabled if the station uses an automation system to process signals. One of the audible signal units may be a reserve, if it can be placed in service within 1 hour.

12.5 Each multiplex receiver, digital alarm communicator receiver and similar receiver shall have an audible signal that will annunciate the receipt of a signal requiring the attention of an operator. The audible signal(s) may be disabled if the station uses an automation system to process signals.

12.6 Wiring connection shall be made to appropriate terminals. Connecting wire shall have the current-carrying capacity and insulation for the service to which it may be subjected. It shall be laced or cabled and protected against physical damage and abrasion by conduit, raceway, or the equivalent.

12.7 If the instructions for alarm-receiving equipment or automation system equipment indicate that it is to be used in a controlled environment where the ambient temperature is to be maintained between 13 and 35°C (55 and 95°F), the area of the station where such equipment is located shall be equipped with a heating, ventilating, and air-conditioning system that will maintain that temperature range. The standby power system shall be capable of powering the heating, ventilating, and air-conditioning system for 24 hours or more. The standby power for the heating, ventilating, and air-conditioning system may be supplied by an engine-driven generator alone.

12.8 When required tests of equipment are made, a record of the test shall be made.

13 Receiver Units

13.1 Direct-wire burglar-alarm systems

13.1.1 General

13.1.1.1 As used in this standard, the term "direct-wire system" refers to a system that provides for the connection of a single protection system to a single alarm-receiving unit at the station. Such equipment shall comply with the requirements for direct-wire alarm units in the Standard for Central-Station Burglar-Alarm Units, UL 1610.

13.1.2 Direct-wire burglar-alarm receiver units

13.1.2.1 Spare direct-wire receiving units shall be kept at each station and arranged so that they can be placed in service within 1 hour.

13.2 Code (McCulloh) transmitter systems

13.2.1 General

13.2.1.1 As used in this standard, the term "code transmitter system" refers to a system that provides for the connection of more than one protection system to a single alarm receiving unit at the station. Such equipment used for burglar-alarm service shall comply with the requirements for code transmitter alarm units in the Standard for Central-Station Burglar-Alarm Units, UL 1610. Such equipment used for fire-alarm service shall comply with the requirements for code transmitter alarm units in the Standard for Control Units for Fire-Protective Signaling Systems, UL 864.

13.2.1.2 Connection between the subscriber's protective wiring and the receiving unit at the station shall be made by means of a code transmitter that is connected to the subscriber's control unit or is an integral part of the control unit.

13.2.2 Receiving units

13.2.2.1 Code signals shall be received at the central-station or residential monitoring station and recorded on a tape register or other recording instrument that complies with the Standard for Central-Station Burglar-Alarm Units, UL 1610, or Control Units for Fire-Protective Systems, UL 864. Each station line circuit shall include at least one recording instrument.

13.2.2.2 An audible signal shall sound while a code signal is being received. An audible signal connected in common to more than one switchboard unit may be used for this purpose.

13.2.2.3 Each line circuit shall be provided with a visual signal that is activated while a signal is being received from any equipment on its circuit. The circuit from which the signal is being transmitted shall be identifiable under this arrangement.

13.2.3 Burglar-alarm service

13.2.3.1 Not more than 15 active burglar-alarm code transmitters shall be connected to one circuit. Each code transmitter shall send an individual signal readily distinguishable from the signal of any other code transmitter on the same circuit. See Table 13.1.

13.2.3.2 Inactive code transmitters (excluding fire-alarm, see 13.2.5.1) may be connected to circuits servicing active burglar-alarm systems.

13.2.3.3 No more than 20 inactive (excluding fire-alarm, see 13.2.5.1) code transmitters may be connected in one circuit serving active burglar-alarm systems. See Table 13.1.

13.2.3.4 For every ten inactive (excluding fire-alarm, see 13.2.5.1) code transmitters connected in one circuit, the number of active burglar-alarm code transmitters that may be connected in the circuit shall be reduced by one, beginning with a maximum of 15 active burglar-alarm code transmitters being

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permitted (as specified in 13.2.3.1) when no inactive transmitters are connected. For example, if 20 inactive code transmitters are connected in one circuit, the circuit shall not have more than 13 active burglar-alarm code transmitters. See Table 13.1.

Exception: If all of the code transmitters in a circuit (excluding fire-alarm, see 13.2.5.1) are inactive, the total number can be 250.

Table 13.1
Number of code transmitters allowed on a circuit

Normal transmitters,		Non-clash transmitters,	
active	inactive	active	inactive
15	0	45	0
14	10	42	30
13	20	39	60
0	250	0	250 ^a
^a Excludes fire alarm transmitters			

13.2.3.5 If the equipment is able to operate without signal clash or loss, the maximum number of code transmitters, both inactive and active (excluding fire-alarm, see 13.2.5.1), permitted in 13.2.3.1, 13.2.3.3, and 13.2.3.4, may be multiplied by three but shall not exceed 250 if all of them are inactive. See Table 13.1.

13.2.4 Fire-alarm service

13.2.4.1 A code transmitter circuit that is used for fire-alarm service shall comply with the National Fire Alarm Code, NFPA 72, and shall not exceed 250 transmitters or code wheels.

13.2.5 Fire- and burglar-alarm service

13.2.5.1 If a code transmitter circuit is used for fire-alarm service and other service, such as burglar-alarm, industrial processes, and the like, the number of transmitters used for other services shall be limited to 5 or less.

13.2.6 Spare equipment

13.2.6.1 Spare code transmitter receiving units and recorders shall be kept at each station and arranged so that they can be placed in service within 1 hour.

13.3 Multiplex systems

13.3.1 General

13.3.1.1 For the purpose of these requirements, the term "multiplexing" refers to a method of signaling characterized by the simultaneous or sequential transmission and reception of multiple signals over a communication channel and the provision of means for positively identifying each signal. The signaling may be accomplished over a communication channel or radio carrier or a combination of both.

13.3.1.2 The signal may be transmitted from the protection system directly to the central-station or residential monitoring station, or through a subsidiary station or repeater station.

13.3.1.3 Equipment used in a burglar-alarm multiplex system shall comply with the requirements for multiplex alarm units in the Standard for Central-Station Burglar-Alarm Units, UL 1610. Equipment used in a fire-alarm multiplex system shall comply with the requirements for multiplex alarm units in the Standard for Control Units for Fire-Protective Signaling Systems, UL 864.

13.3.2 Receiving units

13.3.2.1 The number of burglar-alarm systems served by a multiplex receiver shall be limited to 1000.

Exception: The capacity of the system is considered to be unlimited if the station equipment is completely duplicated by standby equipment and a switchover can be accomplished in not more than 90 seconds with no loss of signals during this period.

13.3.2.2 The loading of a multiplex system used to provide fire-alarm service shall comply with the requirements of the National Fire Alarm Code, NFPA 72.

13.3.2.3 Spare parts of equipment shall be maintained at the station so that any component whose malfunction will prevent the receipt and interpretation of signals can be replaced and the system restored to service within 1 hour. Spare parts are not required if the equipment is duplicated.

13.4 Digital alarm radio system (DARS)

13.4.1 General

13.4.1.1 A digital alarm radio system (DARS) is a one-way radio system that provides for a secondary means of signal transmission in an alarm system that uses a digital alarm communicator transmitter (DACT). The signal transmission shall be after the DACT has failed to make successful contact with the DACR or its transmission shall be simultaneous with the transmission by the DACT. Equipment used in a DARS shall comply with the requirements for such equipment in the Standards for Central-Station Burglar-Alarm Units, UL 1610, and Control Units for Fire-Protective Systems, UL 864.

13.4.1.1 effective January 1, 1999

13.4.1.2 Failure of the telephone line connected to the DACT shall result in a trouble signal being transmitted to the digital alarm radio receiver (DARR) within 4 minutes of detection of the fault.

13.4.1.2 effective January 1, 1999

13.4.1.3 A DARS shall have a 90 percent probability of successfully completing each transmission sequence.

13.4.1.3 effective January 1, 1999

13.4.2 Digital alarm radio transmitter (DART)

13.4.2.1 A transmission sequence by a digital alarm radio transmitter (DART) shall be repeated a minimum of five times. The transmissions may be terminated in less than five sequences if the DACT successfully communicates with the DACR.

13.4.2.1 effective January 1, 1999

13.4.2.2 A DART shall transmit a digital code or the equivalent by use of radio transmission to its associated DARR. Signal repetition, digital parity check, or some equivalent means of signal verification shall be used.

13.4.2.2 effective January 1, 1999

13.4.2.3 Each DART shall automatically initiate and complete a test signal transmission sequence to its associated DARR at least once every 24 hours. A successful DART signal transmission sequence of any type within the same 24-hour period shall be considered sufficient to fulfill this requirement if the signals received by the DARR are processed by an automation system which will alert operators of the delinquency of a 24-hour test signal. If no signals are transmitted during a 24-hour period, a special signal for this purpose shall be transmitted. If an automation system with this feature is not used, or if an automation system is not used, the test signal shall be transmitted at the same time every 24 hours.

13.4.2.3 effective January 1, 1999

13.4.3 Digital alarm radio receiver (DARR)

13.4.3.1 A standby DARR shall be provided at the station and shall be capable of replacing a failed unit within 30 seconds after detection of the failure.

13.4.3.1 effective January 1, 1999

13.4.3.2 The following functions shall be supervised at the manned station:

- a) Failure of AC power supplying the DARR equipment;
- b) Malfunction of the operating DARR;
- c) Malfunction of the receiving antenna and interconnecting cable;
- d) Indication of an automatic switchover between the DARR units; and
- e) Malfunction of the data transmission line between the DARR and a station which is remotely located from the DARR.

13.4.3.2 effective January 1, 1999

13.5 One way radio alarm system (OWRAS)

13.5.1 General

13.5.1.1 A one way radio alarm system (OWRAS) consists of a radio alarm transmitter (RAT) located at the protected premises which will transmit one way signals to a radio alarm supervising station receiver (RASSR) located at the station. The transmission of the signal shall be through at least two independently powered, independently operating and separately located radio alarm repeater station receivers (RARSR) which shall relay the signal on to the RASSR.

Exception: The transmission may be through one RARSR and also independently sent directly to the RASSR.

13.5.1.1 effective January 1, 1999

13.5.1.2 The OWRAS may be independently owned and operated by the station, or it may be through a company providing an alarm and signal transport service network.

13.5.1.2 effective January 1, 1999

13.5.1.3 The equipment used in an OWRAS shall comply with the requirements for such equipment in the Standards for Central-Station Burglar-Alarm Units, UL 1610, and Control Units for Fire-Protective Systems, UL 864.

13.5.1.3 effective January 1, 1999

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13.5.2 Signal transmission time and probability

13.5.2.1 The time required to transmit a signal from a RAT to a RASSR shall be as indicated in (a) – (c). There shall be:

- a) A 90 percent probability that the time between the initiation of a signal until it is recorded at the central-station or residential monitoring station shall not exceed 90 seconds;
- b) A 99 percent probability that the time between the initiation of a signal until it is recorded at the station shall not exceed 180 seconds; and
- c) A 99.999 percent probability that the time between the initiation of a signal until it is recorded at the station shall not exceed 450 seconds (7.5 minutes). At that time the RAT shall cease transmitting.

13.5.2.1 effective January 1, 1999

13.5.3 Supervision

13.5.3.1 The following conditions at each RARSR shall be supervised:

- a) Failure of AC power supply of the radio equipment;
- b) Radio receiver malfunction; and
- c) Indication of an automatic switchover to another RARSR (if applicable).

13.5.3.1 effective January 1, 1999

13.5.3.2 In an OWRAS owned and operated by a central-station or residential monitoring station, these conditions shall be annunciated at the station. If the OWRAS service is provided through an independently owned and operated alarm and signal transport service network, the annunciation shall be at one of the stations served by the network or shall be by other means determined to be acceptable.

13.5.3.2 effective January 1, 1999

13.5.4 Protected premises supervision

13.5.4.1 A RAT shall be used with another signal transmission method that will provide for the receipt of an acknowledgement signal from the station when the system is armed. See 31.2.1 and Table 31.2. An alarm signal shall be transmitted over both the RAT and the other method of signal transmission. Other signals, such as opening and closing, may be transmitted over only one of the signal transmission methods.

13.5.4.1 effective January 1, 1999

13.5.4.2 A RAT shall automatically initiate and complete a test signal transmission sequence to its associated RASSR at least once every 24 hours. If the signals from the RASSR are processed by an automation system that will notify operating personnel that a RAT is delinquent with its 24-hour test signal, a signal of any type within each 24-hour period will meet this requirement. If no signals are transmitted during a 24-hour period, a special signal for this purpose shall be transmitted. If an automation system with this feature is not used, or if an automation system is not used, the test signal shall be transmitted at the same time every 24 hours.

13.5.4.2 effective January 1, 1999

13.5.5 Minimum equipment

13.5.5.1 An OWRAS that is owned and operated by the station shall have a minimum of two independently-powered, independently-operating, and separately located RARSR.

Exception: If the transmission from each RAT can be made directly to the RASSR at the station as well as through one RARSR, the system may operate with one RARSR.

13.5.5.1 effective January 1, 1999

13.5.5.2 If the OWRAS operates through an alarm and signal transport service network provided by an independent company, the network shall have a minimum of three independently powered, independently operating, and separately located RARSRs.

13.5.5.2 effective January 1, 1999

13.5.5.3 The station shall have a standby RASSR that can be put into service within 30 seconds after it has been determined that the operating RASSR has failed.

13.5.5.3 effective January 1, 1999

13.5.5.4 The failure of a RARSR to receive and relay signals from a RAT shall be annunciated at the station in a system that is owned and operated by the central-station or residential monitoring station. In an alarm and signal transport service system, the failure of a RARSR to process signals shall be annunciated at the station supervising the operation of the network.

13.5.5.4 effective January 1, 1999

13.6 Two-way radio alarm system (TWRAS)

13.6.1 A two-way radio alarm system (TWRAS) shall comply with all of the requirements for a one-way radio alarm system (OWRAS) with the exception that the protected premises is equipped with a radio alarm transmitter/receiver (RATR) which is capable of receiving signals as well as transmitting them. The station shall be equipped with a minimum of two radio transmitters capable of transmitting interrogation signals to each RATR in the system either directly or through one or more RARSRs.

13.6.1 effective January 1, 1999

13.6.2 The station standby radio transmitters shall be operated once a month to determine proper operation. A record shall be kept of the dates and times that the units are operated.

13.6.2 effective January 1, 1999

13.7 Digital alarm communicator system units

13.7.1 General

13.7.1.1 For the purpose of these requirements, the term "digital alarm communicator system" refers to a system that provides for the connection of a protection system to a station through the telephone company's switched network or a cellular telephone system (dial system). Equipment used in such a system for burglar-alarm service shall comply with the Standard for Digital Alarm Communicator System Units, UL 1635. Equipment used in such a system for fire-alarm service shall comply with the Standard for Control-Units for Fire Protective Signaling Systems, UL 864.

13.7.2 Digital alarm communicator receiver (DACR)

13.7.2.1 There shall be spare DACR receivers that can be put into service in 30 seconds or less. One spare receiver unit shall be available as a backup for a maximum of five active units. A spare DACR shall have the same or greater capacity as any DACR it is to replace.

13.7.2.1 effective January 1, 1999

13.7.2.2 A DACR shall be provided with a minimum of two telephone lines (numbers) and a maximum of eight. See Table 13.2. Each line (number) shall be supervised so that the operator will be alerted by audible and visual signals if any line develops a fault that would prevent its use. A fault on any one of the telephone lines (numbers) shall not prevent the receiver from utilizing the remaining lines. All lines (numbers) serving a DACR shall be for digital alarm communicator transmitter signals only and shall be unlisted.

13.7.2.2 effective January 1, 1999

Table 13.2
System transmitters

System loading at a central-station, subsidiary station, or residential monitoring station	Number of lines in hunt group				
	1	2	3	4	5 to 8
With DACR lines processed in parallel:	N				
Number of initiating circuits	O	5000	10000	20000	20000
Number of DACTs	T	500	1500	3000	3000
	A				
	C				
	C				
With DACR lines process serially (put on hold, then answered one at a time):	E				
Number of initiating circuits	P	3000	5000	6000	6000
Number of DACTs	T	300	800	1000	1000
	A				
	B				
	L				
	E				

13.7.2.3 The loading capacity of a digital alarm communicator receiver shall be in accordance with Table 13.2 or it shall be demonstrated that there is a 90 percent probability that an incoming call will be accepted immediately.

13.7.2.4 For each active alarm system or each suppressed guard tour, the allowable number of DACTs specified in Table 13.2 shall be reduced by:

- 10 for a 4-line hunt group;
- 7 for a 5-line hunt group;
- 6 for a 6-line hunt group;
- 5 for a 7-line hunt group; or
- 4 for a 8-line hunt group.

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13.7.2.5 For each unsuppressed guard tour, the allowable number of DACTs specified in Table 13.2 shall be reduced by:

- a) 30 for a 4-line hunt group;
- b) 21 for a 5-line hunt group;
- c) 18 for a 6-line hunt group;
- d) 15 for a 7-line hunt group; or
- e) 12 for a 8-line hunt group.

13.7.2.6 At least one signal shall be received over each of the lines (numbers) connected to a DACR once every 24 hours.

14 Automation Systems

14.1 For the purpose of these requirements, an automation system is a system that is used to automatically process signals received by the station receivers. An automation system shall comply with the Standard for Safety for:

- a) Control Units for Fire-Protective Signaling Systems, UL 864; or
- b) Central-Station Burglar-Alarm Units, UL 1610; or
- c) Central-Station Automation Systems, UL 1981.

14.2 If the system serves more than 200 active systems or more than 1000 inactive systems, the following conditions shall be met:

- a) The automation system's main computer, hard disk, main computer's video display terminal, and the software components including the operating system, program languages, and the alarm monitoring software shall be completely duplicated so as to constitute a backup computer system. The backup computer shall be switched over within 30 seconds so that it is energized and can be connected to the receivers, printers, and other devices required for the system. The backup system shall be fully operational within 6 minutes of the loss of the primary system. This allows 30 seconds for plugging in the computer and switching the communication lines over to the backup system and allows 5-1/2 additional minutes for the system to boot up, conduct memory tests, file system check, security verifications, and prepare for full operation. The backup computer shall have all the capabilities of the primary computer, including memory size, speed, and the like. The station operators and supervisor(s) shall be trained monthly in making the switchover and bringing the backup computer on line.

Exception: A fault-tolerant computer system is acceptable as a duplicated computer system.

- b) The station operators and supervisor(s) are trained for a period of not less than one hour per month in the use of receivers, and on maintaining sufficient current documentation on hand to handle signals directly from the receivers. A log documenting such training shall be available at the station.
- c) The receivers are located in the same room or area as the operators. A glass partition, allowing visual observation of the receivers, may separate the operators and receivers.

d) The database on the backup computer shall be updated not less than once every 24 hours. Automation systems that serve not more than 1000 active systems or not more than 5000 inactive systems may update the database on the backup computer on a weekly basis if they make a backup copy of the database on a floppy disk or tape not less than once every 24 hours.

14.2 effective May 1, 1997 to coincide with UL 1981. Until May 1, 1997, the number of systems requiring duplication shall be 1000 active or 5000 inactive for systems that comply with UL 864 and/or UL 1610

14.3 A completely duplicated automation system is not required when all of the following conditions are met:

a) The automation system does not serve more than 200 active systems nor more than 1000 inactive systems and operates in the degraded mode of operation using the receivers.

b) The station supervisors and operators are trained in the use of receivers for a period long enough to enable them to handle signals directly from the receivers. They shall be tested after receiving the training to ensure that they are capable of handling signals directly from receivers. A log documenting such training and testing shall be available at the station.

c) The station shall maintain sufficient current documentation on hand to enable the operators to handle signals directly from the receiver.

d) The functions of the receivers connected to the automation system that are suppressed during operation of the automation system shall revert back to normal operation upon failure of the automation system. Such functions include printing all incoming signals and providing audible and visual indications of change-of-status signals.

e) The receivers are located in the same room or area as the operators and are accessible for operation. A glass partition, allowing visual observation of the receivers, may separate the operators and receivers.

14.3 effective May 1, 1997 to coincide with UL 1981 (See a). Until May 1, 1997, the number of systems requiring duplication shall be 1000 active or 5000 inactive for systems that comply with UL 864 and/or UL 1610

14.4 Failure of the main computer system, hard disk, alarm monitor, and switchover to the backup shall be indicated by an audible and visual signal within 90 seconds of the occurrence of the fault. A visual display condition under which the failure or switchover condition is obvious to the operator is acceptable in lieu of both visual and audible signal.

14.4 effective May 1, 1997 to coincide with UL 1981

14.5 When an automation system is required to be duplicated, the secondary power supply shall maintain its operation. See Power Supply, Section 9.

14.5 effective May 1, 1997 to coincide with UL 1981

FIRE-ALARM SERVICES

15 Type of Service

15.1 Service in accordance with the National Fire Alarm Code, NFPA 72, or the Standard for Installation, Maintenance and Use of Central-Station Signaling Systems, NFPA 71, is provided in one of the following ways:

- a) Full Service – A central-station that provides monitoring, re-transmission of signals, and associated record keeping and reporting for signals received from central-station fire-alarm systems. The station provides for protected premises equipment installation, inspection, testing, maintenance, and repair service of central-station systems, runner service, and associated central-station services, either directly or by subcontracting for these services.
- b) Monitoring – A central-station that provides monitoring, re-transmission of signals, and associated record keeping and reporting for signals from central-station fire-alarm systems. Other services are not provided.
- c) Fire-Alarm Service – Local Company – A company that provides for protected premises equipment installation, inspection, testing, maintenance, and repair service of central-station fire-alarm systems with its own facilities and personnel. Monitoring, re-transmission of signals, associated record keeping and reporting for signals from central-station fire-alarm systems is to be subcontracted with a central-station. Runner service is provided by the company or the central-station.

16 Central-Station Operation

16.1 A central-station shall be equipped with a cellular telephone or an equivalent means of voice communication that is independent of the telephone cable that is between the station and the serving wire center of the telephone company.

16.1 effective January 1, 1999

16.2 There shall be a written plan of action for the restoration of service by a central-station. The plan shall include the following.

- a) Foreseeable disasters: Possible natural and man-made disaster threats, national and local, that could effect the station.
- b) Emergency names list: A notification list that includes the names and the telephone numbers at work, home, vacation home, and the like, and home addresses of management, technical, operators, runners, and other relevant personnel.
- c) Equipment vender contacts: The 24-hour telephone and fax numbers of the vendors, technical assistance providers, and maintenance contractors of the equipment used in the station.
- d) Municipal agency contacts: Emergency telephone numbers for local municipal agencies, such as the fire and police departments, to be called for help.
- e) Utility contacts: Formalized emergency procedures and 24-hour contact names and telephone numbers of the utility and telephone companies serving the station.
- f) If an engine-driven generator(s) is used that requires on-site fuel storage, there shall be a 24-hours a day contact and telephone number for a source of fuel resupply.

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g) Relocation site: If a relocation site is provided for, information on the location of the site, how to get there, how to put the site into operation, and 24-hour, emergency management contact names and telephone numbers.

16.2 effective January 1, 1999

16.3 Supervisory personnel and designated employees shall be made familiar with the plan and shall know the location of a copy of the plan that is kept at the station. The implementation of the plan shall be practiced annually to assure that all personnel know their responsibilities in case of an emergency.

16.3 effective January 1, 1999

16.4 The plan shall be reviewed and updated every six months and current copies shall be kept in designated and accessible locations.

16.4 effective January 1, 1999

17 Personnel (Operators and Runners)

17.1 The central-station shall have sufficient personnel (at least two persons), trained as operators, on duty at the station at all times to provide immediate attention to signals requiring action. No other operator activity shall take precedence over receiving and acting on these signals.

17.2 There shall be a sufficient number of runners and servicepersons available to provide required response to alarm signals, trouble signals, service requests, and maintenance requests.

17.3 The runners or servicepersons shall be available at all times at any of the following:

- a) The central-station;
- b) A subsidiary, runner or serviceperson station or service center equipped with single party or cellular telephone or radio communication with the central-station;
- c) In a vehicle or in an area, and equipped with a cellular telephone or with a radio that can contact the central-station; or
- d) At a location acceptable to the local authority having jurisdiction and which is provided with a single party or cellular telephone, or is in radio contact with the central-station.

17.4 The runner or serviceperson shall be trained and equipped for the performance of their duties and available for prompt dispatch to provide service to the protected property.

17.5 Runners and servicepersons shall provide service as required by this standard.

18 Runner's Equipment

18.1 Runners shall be equipped with a uniform that identifies their company and shall also be provided with a means of identifying the central-station that they are responding for. Runners shall also be equipped with a flashlight, any tools required, and personal identification.

18.1 effective January 1, 1999

19 Communication and Test

19.1 A single-party telephone line, cellular telephone, or radio link shall be used by the fire-alarm central-station to contact a runner station to dispatch runners. The communication means shall be tested by a central station operator at the beginning of every shift change and a record of the test is to be made. A single-party or cellular telephone shall have call waiting or an equivalent means of interrupting a call in progress.

20 Re-Transmission

20.1 Two independent means, acceptable to the authority having jurisdiction over the property, shall be provided for the retransmission of fire-alarm signals to the appropriate public fire service communication center.

20.2 If telephone equipment is used as both the primary and secondary means of retransmission, the central-station shall be equipped with a minimum of two telephone lines, each having its own telephone device, connected to the public switched telephone network. A minimum of two telephone numbers shall be available for contacting the public fire service communication center to which the central-station operator may retransmit an alarm signal.

21 Records

21.1 Accurate records of the service provided by a central-station shall be kept for at least 1 year. Records shall include date and time entries and the following information (the date shall include the year which may be recorded using the last digit of the year only):

a) Fire-alarms:

- 1) Receipt of signal;
- 2) Signal retransmission to the appropriate public fire service communication center;
- 3) Dispatch of runners (if required);
- 4) Arrival of runners (if dispatched);
- 5) Nature of the alarm (type and disposition);
- 6) The name or employee identification of the runner(s) (if dispatched) who are representing the alarm company;
- 7) System identification by number or subscriber's name and address;
- 8) Identification of the operator who processed the alarm;
- 9) Identification of the person designated by the subscriber that was notified of the alarm and the time and date of the notification; and
- 10) Identity of the fire department responding.

b) Supervisory signals:

- 1) Receipt of signal;

- 2) Communication of information to person(s) designated by the subscriber;
- 3) Dispatch of runners (if required);
- 4) Arrival of runners (if dispatched);
- 5) Notification of the fire department and/or law enforcement agency, if required;
- 6) Nature of the signal (type and disposition);
- 7) The name or employee identification of the runner(s) (if dispatched) representing the alarm company;
- 8) System identification by number or subscriber's name and address;
- 9) Identification of the operator who processed the signal; and
- 10) Identification of the person designated by the subscriber that was notified of the signal.

c) Trouble signals:

- 1) Receipt of signal;
- 2) Communication of information to person(s) designated by the subscriber;
- 3) Dispatch of runners (if required) to arrive within 4 hours to begin maintenance;
- 4) Arrival of maintenance personnel (if dispatched);
- 5) Nature of the signal (type and disposition);
- 6) The name or employee identification of the maintenance personnel (if dispatched);
- 7) System identification by number or subscriber's name and address;
- 8) Identification of the operator who processed the signal; and
- 9) Identification of the person designated by the subscriber that was notified of the signal.

d) For inspection, testing and maintenance, a record shall be made of each specific device inspected, tested or serviced.

21.2 All such entries shall be made in ink on a physical medium or recorded into the non-volatile memory of an automation system from where they can be displayed and, if needed, printed on command. All times and dates shall be entered by date-time stamp or by an automation system.

22 Maintenance and Service

22.1 Contracts and agreements

22.1.1 All installations shall be maintained by the central-station company under a service contract or agreement and shall be inspected and tested at intervals in accordance with the National Fire Alarm Code, NFPA 72, or the intervals specified by the authority having jurisdiction.

22.1.2 The contract or agreement must provide for all of the service required by the National Fire Alarm Code, NFPA 72, or the authority having jurisdiction.

22.2 Alarm, supervisory, and trouble signals

22.2.1 Service for an alarm system shall be in accordance with the requirements of the National Fire Alarm Code, NFPA 72. The maximum range of travel (driving time) in a land-based service vehicle from a service center to a protected property shall not exceed 1 hour for a fire-alarm system or 1/2 hour for a guard's tour system.

Exception: If authorized by the authority having jurisdiction, the range of travel noted above to reach a protected property may be extended to 4 hours.

22.2.2 The alarm service company shall maintain a means of receiving requests for service at all times and shall keep a record of the time and date that:

- a) A service request is received,
- b) The service is initiated, and
- c) The repairs are completed.

Requests for service shall be received by alarm service company personnel or a method shall be devised that will result in the initiation of service within the time interval indicated in 22.1.1.

22.2.2 effective January 1, 1999

22.2.3 The alarm service company shall provide the alarm service subscriber with written instructions on how to contact the company for service. The method of communication shall allow the subscriber to promptly report trouble conditions.

22.2.3 effective January 1, 1999

22.3 Signals from systems other than central-station fire-alarm systems

22.3.1 When a signal is received from a system that is not a central-station fire-alarm type as defined by this standard, the operator shall notify the agency(s) or person(s) specified by the subscriber.

22.3.1 effective January 1, 1999

22.3.2 The station shall notify the alarm service company responsible for the alarm system of the alarm signal and the action taken in response to it. If the alarm service company is closed for business at that time, they shall be notified when they are next open for business.

22.3.2 effective January 1, 1999

23 Testing and Inspection

23.1 Central-station fire-alarm systems shall be inspected and tested as required by the National Fire Alarm Code, NFPA 72; the Standard for Installation, Maintenance and Use of Central-Station Signaling Systems, NFPA 71; or as specified by the authority having jurisdiction.

24 Protected Premises Control and Transmitter Units

24.1 A fire-alarm control unit and transmitter shall comply with the requirements in the Standard for Control Units for Fire-Protective Signaling Systems, UL 864; and shall be installed in accordance with the requirements of the National Fire Alarm Code, NFPA 72, or the Standard for Installation, Maintenance, and Use of Central-Station Signaling Systems, NFPA 71.

24.2 The central-station fire-alarm system at the protected premises shall be provided with standby power that will operate the system as intended for 24 hours as required by the National Fire Alarm Code, NFPA 72, or the Standard for Signaling Systems for Central-Station Service, NFPA 71.

BURGLAR-ALARM SERVICES

25 Central-Station Operation

25.1 A central-station shall be equipped with a cellular telephone or an equivalent means of voice communication that is independent of the telephone cable connected between the station and the serving wire center of the telephone company.

25.1 effective January 1, 1999

25.2 There shall be a written plan of action for the restoration of service by a central-station. The plan shall include the following:

- a) Foreseeable disasters: Possible natural and man-made disaster threats, national and local, that could effect the station.
- b) Emergency names list: A notification list that includes the names and the telephone numbers at work, home, vacation home, and the like, and home addresses of management, technical, operators, runners, and other relevant personnel.
- c) Equipment vender contacts: The 24-hour telephone and fax numbers of the vendors, technical assistance providers, and maintenance contractors of the equipment used in the station.
- d) Municipal agency contacts: Emergency telephone numbers for local municipal agencies, such as the fire and police departments, to be called for help.
- e) Utility contacts: Formalized emergency procedures and 24-hour contact names and telephone numbers of the utility and telephone companies serving the station.
- f) If an engine-driven generator(s) is used that requires on-site fuel storage, there shall be a 24-hours a day contact and telephone number for a source of fuel resupply.
- g) Relocation site: If a relocation site is provided for information on the location of the site, how to get there, how to put the site into operation, and 24-hour emergency management contact names and telephone numbers.

25.2 effective January 1, 1999

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25.3 Supervisory personnel and designated employees shall be made familiar with the plan and shall know the location of a copy of the plan that is kept at the station. The implementation of the plan shall be practiced annually to assure that all personnel know their responsibilities in case of an emergency.

25.3 effective January 1, 1999

25.4 The plan shall be reviewed and updated every six months and current copies shall be kept in designated and accessible locations.

25.4 effective January 1, 1999

26 Personnel (Operators and Runners)

26.1 The burglar-alarm central-station shall have sufficient personnel (at least two persons), trained as operators, on duty at the station at all times to provide immediate attention to signals requiring action. No other operator activity shall take precedence over receiving and acting on these signals.

26.1 effective January 1, 1999

26.2 There shall be a sufficient number of runners and servicepersons available to provide the required response to alarm signals, trouble signals, repair service requests, and maintenance requests.

26.3 The runners or servicepersons shall be available at all times at any of the following:

- a) At the central-station,
- b) At a subsidiary, runner or serviceperson station or service center equipped with single party or cellular telephone or radio communication with the central-station, or
- c) In a vehicle or in an area, and equipped with a cellular telephone or with a radio that can contact the central-station.

26.4 The runner or serviceperson shall be trained and equipped in the performance of their duties, to provide prompt service to the protected property.

26.5 Runners and servicepersons shall provide service as required by this standard.

27 Runner's Equipment

27.1 Runners shall be equipped with a uniform that identifies their company and shall also be provided with a badge or the like that identifies the central-station that they are responding for. They shall also be equipped with a flashlight, identification, and a firearm or night stick.

27.1 effective January 1, 1999

28 Communication and Test

28.1 A single-party telephone line, cellular telephone, or radio link shall be used by the burglar-alarm central-station to contact a runner station to dispatch runners. The communication means shall be tested by a central station operator at the beginning of every shift change and a record of the test is to be made. A single-party or cellular telephone shall have call waiting or an equivalent means of interrupting a call in progress.

29 Re-Transmission

29.1 A means shall be provided for the retransmission of burglar-alarm signals to law enforcement or other agency(s) or individual(s) designated by the subscriber.

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29.2 If telephone equipment is used as the means of retransmission, the central-station shall be equipped with a minimum of two telephone lines, each having its own telephone device, connected to the public switched telephone network.

29.3 If the method of retransmission utilizes the public switched telephone network, the correctness of the telephone number of each law enforcement or other agency, or individual designated by the subscribers to be contacted, shall be verified by calling each number every 12 months. All other methods of retransmission shall be tested every 7 days. A record of all such tests shall be maintained.

Exception: The telephone number of an individual designated to be contacted need not be verified if they are a secondary contact.

30 Burglar-Alarm Protected Premises Control Units

30.1 General

30.1.1 A subscriber control unit for a burglar-alarm system shall provide for the connection of protective wiring, conductors, and attachments in accordance with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, as well as with the Standards for Central-Station Burglar-Alarm Units, UL 1610, or Digital Alarm Communicator System Units, UL 1635.

30.1.2 A control unit, line security unit, radio (RF) unit, interface unit, and accessory unit that is located within the protected area, shall have its cover protected by a tamper switch or the equivalent to prevent its being opened so as to defeat the system.

30.1.3 A burglar-alarm control unit, a line security unit, a radio (RF) unit, an interface unit, an accessory, a power supply, and the like, that is intended to be located outside the protected area shall be protected against tampering and unauthorized opening.

30.1.4 With reference to the requirements of 30.1.2, a control unit, line security unit, radio (RF) unit, interface unit, and accessory unit intended to be mounted on the exterior of a complete vault, complete safe, or No. 1 stockroom or premises shall be electrically protected as required by the Standards for Central-Station Burglar-Alarm Units, UL 1610, or Digital Alarm Communicator System Units, UL 1635, so that no opening can be created of sufficient size, or the cover opened to an extent, that will permit defeat of the system.

30.2 Direct-wire, burglar-alarm subscriber control units

30.2.1 If the subscriber's control unit provides for it, permanent protection shall be supervised when the protection system is disarmed and a signal shall be transmitted to the central-station if it is disrupted.

30.2.2 The act of changing the protection mode at the subscriber unit shall cause a signal at the central-station.

30.3 Code (McCulloh) transmitter burglar-alarm systems subscriber control units

30.3.1 If a subscriber's protective circuit is disturbed by an intrusion or unauthorized opening, the code transmitter shall send a coded signal to the central-station and shall repeat it not less than three times.

30.4 Multiplex burglar-alarm systems subscriber control unit

30.4.1 If the subscriber's control unit provides for it, permanent protective wiring shall be supervised when the protection system is disarmed and a signal shall be transmitted to the central-station if it is disrupted.

30.4.1 effective January 1, 1999

30.5 Digital alarm communicator transmitter (DACT) subscriber control unit

30.5.1 A burglar alarm DACT shall be supervised in one of the following ways:

a) Two telephone lines shall be used and the transmitter shall be able to switch from one to the other. Both telephone lines shall be monitored so that if a fault develops on either one, the transmitter will contact the receiver through the remaining line to report the fault and identify it as a telephone line trouble. The telephone line used for primary reporting shall be connected to not more than one telephone instrument that has bell-ringing capacitors. The secondary telephone line shall be connected to not more than two telephone instruments that have bell-ringing capacitors. The number of telephone instruments without bell-ringing capacitors are not limited. The transmitter shall contact the receiver with an identifiable signal at least once every 24 hours.

b) If one telephone line is connected to the transmitter, the transmitter shall contact the receiver with an identifiable signal at least once every 24 hours.

If signals are processed by an automation system that will notify operating personnel that a DACT is delinquent with its 24 hour test signal, the normally scheduled opening signal, closing signal, or any other identifiable signal may be used for this purpose. If none of these signals are transmitted during a 24 hour period, a special signal for this purpose shall be transmitted. If an automation system with this feature is not used, or if an automation system is not used, the test signal shall be transmitted at the same time every 24 hours. The telephone line(s) for (a) and (b) shall be over the regular telephone system or a cellular telephone system. The secondary line for (a) may be over a one way digital alarm radio system (DARS). See One Way Radio Alarm System (OWRAS), Section 13.5.

30.5.1 effective January 1, 1999

30.5.2 If the subscriber's control unit provides for it, permanent protective wiring shall be supervised when the protection system is disarmed and a signal shall be transmitted to the central-station if it is disrupted.

30.5.2 effective January 1, 1999

30.6 Radio (RF) systems subscriber's control unit

30.6.1 Refer to the requirements for radio (RF) systems in Sections 13.4 – 13.6 of this Standard.

31 Burglar-Alarm Protection Service

31.1 Alarm response time

31.1.1 The central-station shall establish the time, in 5-minute increments, that it will take to respond to an alarm from a protection system as follows:

a) 5 – 45 minutes for a system with standard line security or encryption line security and

- b) 5 – 60 minutes for other systems.

See the requirements for line security in 31.3.

Exception: Response by a runner is optional for a premises or stockroom system designated as having Extent No. 4 protection as defined in the Standard for Installation and Classification of Burglar and Holdup Alarms, UL 681. If an Extent No. 4 system does not have runner response, the operator shall notify:

- a) The law enforcement agency having jurisdiction over the protected property or*
b) The agency(s) or person(s) specified by the subscriber.

The system shall have no other extent of protection other than Extent No. 4.

31.1.2 An alarm response time of 5 to 10 minutes shall be allowed only for systems that do not require the use of a motorized vehicle on a public road.

31.1.3 The minimum alarm response time stated shall be calculated by making a minimum of two trial runs during a business day during off-peak traffic conditions (not during rush hour) and noting the time (trial time). For systems assigned response times of 5 or 10 minutes, the trial times shall not exceed 5 or 10 minutes, respectively. For systems assigned response times of 15 – 45 or 15 – 60 minutes, the trial time shall not exceed 80 percent of the stated time. See Table 31.1.

Table 31.1
Maximum trial time for stated response times

Standard and encryption line security systems		Other systems	
Time, minutes		Time, minutes	
Stated	Trial	Stated	Trial
15	12	15	12
20	16	20	16
25	20	25	20
30	24	30	24
35	28	35	28
40	32	40	32
45	36	45	36
		50	40
		55	44
		60	48

31.2 Signal transmission methods for burglar-alarm systems

31.2.1 Signals shall be transmitted from the protection system by one or more methods. A signal transmission method that does not provide an acknowledgment signal shall not be used alone. If such a method is used, an additional method of signal transmission that will provide an acknowledgment signal shall be provided. See Table 31.2.

31.2.1 effective January 1, 1999

Table 31.2
Signal transmission methods

Systems that provide an acknowledgement signal	Systems that do not provide acknowledgement signal
Direct wire ^a Multiplex ^a Derived channel ^a Two way radio (RF) ^a DACT/DACR	One way radio (RF) Code transmitter
^a If any equipment used in these types of systems do not provide for an acknowledgement signal, the system that this equipment is a part of shall be used with a method of signal transmission that does provide for an acknowledgement signal.	

31.2.2 The following methods of signal transmission may be used alone if they provide for the transmission of an acknowledgement signal to the protected premises.

- a) Direct wire.
- b) Multiplex.
- c) Derived channel.
- d) Two way radio over:
 - 1) A private radio system or
 - 2) An alarm and signal transport service system,
- e) Dual line digital alarm communicator transmitter (DACT) with 24 hour check-in signal over both lines. The primary and secondary lines used for transmission may be over:
 - 1) Separate cellular telephones;
 - 2) A cellular telephone for the primary line and a telephone line as the secondary line;
 - 3) A telephone line for the primary line and a cellular telephone as the secondary line; or
 - 4) Separate telephone line.

f) Dual line DACT with 24-hour check-in signal over one line only. The primary and secondary lines used for transmission may be over:

- 1) Separate cellular telephones;
- 2) A cellular telephone for the primary line and a telephone line as the secondary line;
- 3) A telephone line for the primary line and a cellular telephone as the secondary line; or
- 4) Separate telephone lines.

g) Dual or single line DACT, with 24 hour check-in signal, as primary signal transmission means over:

- 1) Cellular telephone or
- 2) Telephone line.

Backed up with digital alarm radio transmitter (DART), with 24 hour check-in signal, transmitting one way signals to a digital alarm radio receiver (DARR), as secondary signal transmission means.

h) Single line DACT, with 24 hour check-in signal, over:

- 1) Cellular telephone or
- 2) Telephone line.

31.2.3 The following methods of signal transmission do not provide for the transmission of an acknowledgement signal from the central-station to the protected premises. If these methods are used, they shall be used with another method of signal transmission that will provide for the transmission of an acknowledgement signal. If equipment connected to the systems specified in 31.2.2 (a) – (d) is used that does not provide for the transmission of an acknowledgement signal, those systems shall be used with another method of signal transmission that will provide for the transmission of an acknowledgement signal. These methods are:

- a) One way radio over a private radio system or an alarm and signal transport service network and
- b) Code transmitter.

31.2.4 When more than one means of signal transmission is used, they shall monitor each other's ability to transmit signals. If a fault is detected on any of the signal transmission means, at least one of the other means of signal transmission shall send a signal to the central-station to report the fault.

31.2.5 When a DACT with dual telephone lines (see 31.2.2 (e) and (f)), is used, each line shall monitor the other and transmit a signal to the central-station if a fault is detected on the other line.

31.2.6 When a single line DACT is used with a DART (see 31.2.2(h)), the cellular telephone or telephone line shall be monitored. If a fault is detected, the DART shall send a signal to the DARR to report it.

31.2.7 When more than one method of signal transmission is used in an alarm system that provides standard line security or encryption line security on one or more of the methods, alarm signals shall be transmitted over each method. Opening signals shall be transmitted immediately by either:

- a) The method of transmission that provides line security or
- b) The method that does not provide line security. If the opening signal is not transmitted within five attempts the opening signal or a failure to communicate signal shall be transmitted over the method that provides line security.

Revised 31.2.7 effective January 1, 2000

31.2.8 When more than one method of signal transmission is used in an alarm system that does not provide standard line security or encryption line security, alarm signals shall be transmitted over each method. All other signals may be transmitted over only one of the signal transmission methods.

Exception: A dual line DACT is not required to transmit an alarm signal over both lines.

31.2.8 effective January 1, 1999

31.2.9 A burglar-alarm system shall have the option of having an alarm sounding device installed in accordance with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681. Dependent on the mounting location, an alarm sounding device shall comply with the requirements for an outside, inside/visible or inside/concealed alarm sounding device in the Standard for Police Station Connected Burglar Alarm Units and Systems, UL 365.

31.2.9 revised April 23, 1999

31.2.10 Burglar-alarm system equipment used to transmit signals to the central-station shall comply with the requirements of the Standards for Central-Station Burglar-Alarm Units, UL 1610, or Digital Alarm Communicator System Units, UL 1635.

31.3 Line security

31.3.1 Line security may be provided at the following levels:

- a) Standard: The signal transmission channel is supervised to detect an attempt to compromise the channel.
- b) Encryption: The signal transmission channel is supervised to detect a highly sophisticated attempt to compromise the channel.

31.3.2 The equipment used to provide standard, high or encryption line security supervision shall comply with the requirements of the Standard for Central-Station Burglar-Alarm Units, UL 1610.

32 Openings and Closing

32.1 General

32.1.1 A burglar-alarm system shall be arranged and operated to reduce the risk of the central-station accepting an unauthorized opening (disarming). Systems that are operated without a prearranged schedule shall be operated in accordance with 32.2. Systems that are operated on a prearranged schedule shall be handled in accordance with 32.3. All regular and irregular openings and closing shall be recorded at the central-station by an operator or an automation system. The records shall include the information required in 37.1 (b) and (c).

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32.2 Openings and closing without a schedule

32.2.1 A burglar-alarm system without standard line security or encryption line security may be operated at any time when opening (disarming) and closing (arming) of the system is activated by an authorized user entering a personal identification number (PIN) code of 3 or more digits or characters into the control unit through a key pad or equivalent input device that has 10 or more input buttons or equivalent entry devices.

32.2.2 A burglar-alarm system with standard line security or encryption line security (see Line Security, Section 31.3) may be operated at any time:

- a) When opening (disarming) of the system is activated by an authorized user using the method of 32.2.1 plus a personal identifier using a physical attribute of the person to make the identification and
- b) When closing (arming) of the system is activated by an authorized user using the method of 32.2.1.

32.2.2 effective January 1, 2000

32.2.3 The acceptance and recording of the event at the central-station shall be by either one of the following methods:

- a) The code shall be received, automatically recorded and confirmed by an operator or an automation system at the central-station within 1 minute of its receipt or
- b) The code shall be verified by and stored in the control unit at the protected property. The stored signals shall be transmitted to the central-station, automatically recorded and confirmed by an operator or an automation system at the central-station within 12 hours of the closing (arming) of the system.

32.2.3(b) shall be deleted January 1, 2000

32.2.4 A central-station operator shall contact an authorized user of an alarm system that does not use a specified closing schedule if the system has not been closed by 9:00 PM or 60 minutes after the time that the user of the alarm system has recorded as their expected closing time. An authorized user may reschedule the closing time in accordance with 32.4.2(c). If the authorized user does not reschedule the closing time, an operator shall contact the authorized user every 60 minutes thereafter until the system is closed.

32.2.4 effective January 1, 2000

32.3 Openings and closing with a schedule

32.3.1 A system that opens (disarms) and closes (arms) in accordance with a schedule shall follow a schedule submitted in writing by an authorized person representing the subscriber and kept current at the central-station. The schedule shall specify the times at which the burglar-alarm system is expected to be opened (disarmed) and closed (armed), and the days (including holidays) during which the system will remain closed on an annual basis. The schedule shall be verified every 12 consecutive months with an authorized representative of the subscriber.

32.3.2 Every opening that is more than 5 minutes earlier than the scheduled opening time shall be treated as an alarm unless an authorized user of the alarm system has prearranged the opening in accordance with 32.4.1 or it is cleared by alarm verification. See Alarm Verification, Section 34.2.

32.3.3 For systems that use a written schedule, if, in a 3-month interval, 80 percent or more of the openings for a system in a 3-month interval occur more than 30 minutes after the scheduled time, the written schedule shall be amended to reflect the routine opening times.

32.3.3 effective January 1, 1999

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32.3.4 A central-station operator shall contact an authorized user of an alarm system if the system has not been closed 60 minutes after the scheduled closing time. An authorized user may reschedule the closing time in accordance with 32.4.2(c). If the authorized user does not reschedule the closing time, the operator shall contact the authorized user every 60 minutes thereafter until the system is closed.

32.3.4 effective January 1, 1999

32.4 Unscheduled

32.4.1 For the purpose of these requirements, the term "unscheduled opening" refers to an opening of a burglar-alarm system not made in accordance with an established written schedule. See 32.3.2.

32.4.2 An unscheduled opening may be performed by an authorized user of the system without investigation if it is prearranged in one of the following ways:

- a) The authorized user may appear at the central-station or at a central-station service center prior to the opening to personally specify the time for the opening. The identification and signature of the authorized user shall be verified during the visit. Any opening that actually takes place at a time differing by more than 5 minutes before or 45 minutes after the prearranged opening time shall be considered to be an alarm (with or without the use of alarm verification, 34.2).
- b) The authorized user may send a letter by mail or fax or by other written, clearly legible communication that specifies the time for the opening and bears the signature of the authorized user. The communication shall be typed or hand written in ink. It shall be received at the central-station before the time specified for the opening. Any opening that takes place at a time differing by more than 5 minutes before or 45 minutes after the prearranged opening time shall be considered to be an alarm (with or without the use of alarm verification, 34.2).
- c) The authorized user may telephone, radio, or otherwise use intelligible voice communication with the central-station personnel to notify them of the intended time of the opening and to identify themselves by their identification code and name. The identification code and name shall be checked against the record of authorized users filed by the subscriber. If a copy of this record is provided to the subscriber, it shall not show the identification code. Cards issued to an authorized user showing the identification code shall not identify the protected premises, or
- d) The authorized user may use a PIN code in accordance with 32.2.1 or 32.2.2.

32.5 Control unit programming

32.5.1 The maximum time that a control unit may be programmed to delay the transmission of a signal to the central-station or the energizing of a local alarm sounding device, in order to permit the alarm system user to either enter and disarm the system, or arm the system and exit, shall not exceed:

- a) 60 seconds for a system with standard line security or encryption line security and
- b) 120 seconds for other systems.

See Line Security, Section 31.3.

32.5.2 The use of an universal service code or any other code other than that uniquely tied to an authorized user, or a runner or serviceperson responding to a trouble or alarm signal when the system is in the closed (armed) condition, shall result in the immediate transmission of an alarm signal.

32.5.2 effective January 1, 1999

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33 Closing and Malfunctions During Closing

33.1 The central-station shall return an acknowledgement signal to the control unit when a proper closing signal is received. See 13.5.4.1 and 31.2.1.

Exception: An acknowledgement signal is not required if the control unit is the type that stores the closing signal. See 32.2.2(b).

33.1 effective January 1, 1999; Exception deleted January 1, 2000

33.2 If a malfunction of the burglar-alarm system is:

- a) Reported by the subscriber at the time of closing,
- b) Made apparent by the arming of the system, or
- c) A result of the subscriber's exit,

the central-station shall dispatch a serviceperson within 1 hour of receiving the information. See 38.2.3.

33.3 If the burglar-alarm system cannot be returned to operating condition so that the system can be armed, the central-station shall notify the subscriber or an authorized user of the system of this condition by telephone or similar means that will assure receipt of the message. If the subscriber agrees to come to the premises or sends a representative to guard the premises, the central-station shall provide a runner or serviceperson to remain on the premises for up to 60 minutes after the agreement by the subscriber or until the subscriber or representative arrives at the premises. If the runner or serviceperson is still at the premises when the subscriber or representative arrives, the runner or serviceperson shall record the arrival time of the subscriber or representative and obtain their identification and signature.

33.4 If the subscriber declines to come to the premises or to arrange to have it guarded, the runner may leave after determining that the premises is physically secure. The central-station shall make a record of the time and date of the subscriber's instruction that the premises may be left unguarded, identifying the subscriber by name and identification code.

34 Alarms and Unauthorized Openings

34.1 Alarm investigation

34.1.1 A burglar-alarm signal, communication outage, or unauthorized opening of a protected property that has been closed and the protection system armed, shall be investigated as an alarm condition. See 31.2.7. When such a signal is received the central-station operator shall:

- a) Record the time and date that the signal was received;
- b) If applicable, initiate the verification procedures in 34.2.1 – 34.2.7;
- c) Dispatch runners to investigate if verification procedures do not determine that the alarm signal is acceptable as an opening or if verification procedures do not apply (see 34.1.2);
- d) Notify the subscriber if keys are not held; and
- e) Record the date and time of the arrival of the runner(s) representing the central-station when the runner(s) arrive at the entrance to the protected premises.

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34.1.2 The investigation shall be conducted by:

- a) A runner, with or without keys, representing the central-station and a member of the law enforcement agency having jurisdiction over the property;
- b) Two runners, with keys, representing the central-station and a member of the law enforcement agency having jurisdiction over the property; or
- c) Two runners, with keys, representing the central-station.

At least two persons, consisting of either two runners, one runner and the law enforcement agency having jurisdiction over the property, or one runner and the subscriber, shall enter a protected premises.

34.1.3 An improper opening signal shall be investigated by at least one runner who is a representative of the central-station if the opening occurs within the subscriber's customary opening time period. Investigation is not required if central-station operators identify the person at the premises through the means of Alarm Verification, Section 34.2.

34.1.4 A runner shall carry a card, or shall be given oral instructions, indicating the address of the premises, the floor on which the premises are located, instructions regarding the use of keys, and other information necessary to enable efficient investigation of the alarm.

34.1.5 Alarms from a key installation shall result in a complete search of the premises and accessible adjacent locations. See 34.1.2. A "key installation" is one for which the central-station holds the keys necessary to permit runners immediate access from the street to the interior of the protected premises or the premises enclosing a protected mercantile vault, safe, stockroom, ATM, or the like.

34.1.6 Alarms from an installation for which runners do not possess keys shall result in a complete search of the outside of the premises and the surrounding area by the runners. A runner representing the central-station shall remain at the premises if the subscriber, upon being notified, advises arrival within 1 hour to allow an interior search.

34.1.7 If the subscriber declines to come to the premises to allow an interior search, the runner may leave if there is no physical evidence of unauthorized entry and the premises is physically secure. The central-station shall make a record of the time and date, identifying the subscriber by name and identification code, indicating that the subscriber has declined to come to the premises.

34.1.7 effective January 1, 1999

34.1.8 For a key or no-key system, if there is evidence of unauthorized entry or the premises is not physically secure, the subscriber shall be notified. The runner shall remain at the premises for up to 1 hour if the subscriber agrees to come to the premises or arrange to have it guarded.

34.1.8 effective January 1, 1999

34.1.9 If, after the investigation of an alarm, the system cannot be rearmed, the operating company shall dispatch a serviceperson within 1 hour should the runner or subscriber not be able to correct it. See Repairs, Section 38.2.

34.1.9 effective January 1, 1999

34.1.10 The runner making the investigation of the alarm and who represents the central-station shall leave a notice at the premises for the subscriber reporting that there has been an alarm investigation. The notice shall record the time and date of the investigation.

34.1.10 effective January 1, 1999

34.1.11 Following a burglary attack, the alarm system shall be inspected and any damages repaired. The system shall be given a complete operational inspection and returned to service. A record of the inspection and service performed shall be kept by the central-station.

34.1.11 effective January 1, 1999

34.2 Alarm verification

34.2.1 The central-station may attempt to verify that the cause of an alarm signal is due to the improper use of the alarm equipment by personnel that have authorized access to the premises. Successful verification in accordance with the steps outlined in 34.2.2 – 34.2.7, shall eliminate the need for dispatch and investigation by runners representing the central-station and the law enforcement agency having jurisdiction over the protected property.

Exception: Alarm verification does not apply to signals from equipment installed to protect a stockroom, vault, safe, night depository or automated teller machine unless they are within a protected premises system that complies with the Standard for Installation and Classification of Burglar and Holdup Alarm Systems, UL 681, and it is known that authorized personnel are present at the time that the alarm is caused. Knowledge of authorized personnel's presence is obtained by receipt of a valid system opening signal or by alarm verification procedures described in this section for the protected premises system surrounding the stockroom, vault, safe, night depository, or automated teller machine.

34.2.1 revised January 12, 2007

34.2.2 Alarm verification for a system without standard line security or encryption line security shall be performed by the operator as follows:

- a) A telephone call shall be made to the protected premises immediately after receipt of the alarm;
- b) If telephone contact cannot be made with authorized personnel at the protected premises within 6 rings or 1 minute (whichever comes first) or there is no answer on the first call to the protected premises, a second call or calls shall be made to alternate phone numbers such as a second premises or cellular number;
- c) If telephone contact cannot be made with authorized personnel on or off the premises within a maximum of 2 minutes from the receipt of the signal at the Central Station, runners and/or law enforcement personnel shall be dispatched to the premises;
- d) If contact is made within 2 minutes, an authorized subscriber shall be identified by their name and identification code, which may be transmitted orally or electronically;
- e) If the person(s) contacted cannot be identified by a valid identification code within 2 minutes after the contact, runners and/or law enforcement personnel shall be dispatched to the premises.

The telephone contact in (a) may be initiated by an authorized person at the protected premises.

34.2.2 revised January 12, 2007

34.2.3 Alarm verification for a system with standard line security or encryption line security shall be performed by the operator as follows:

- a) A telephone call shall be made to the protected premises immediately after receipt of the alarm;
- b) If telephone contact cannot be made with authorized personnel at the protected premises within 6 rings or 1 minute (whichever comes first) or there is no answer on the first call to the protected premises, a second call or calls shall be made to alternate phone numbers such as second premises or cellular number;
- c) If telephone contact cannot be made with authorized personnel on or off the premises within a maximum of 2 minutes from the receipt of the signal at the Central Station, runners and/or law enforcement personnel shall be dispatched to the premises;
- d) If contact is made within 2 minutes, an authorized subscriber shall be identified by their name and identification code, which may be transmitted orally or electronically;
- e) An authorized subscriber shall then also be identified by a separate electronically transmitted personal identifier;
- f) The personal identifier of (e) may be a restore signal to the Central Station generated as a result of the entry of a personal numerical identifier code into the subscriber control or the equivalent, or may use a physical attribute of the person to make the identification;
- g) If the person(s) contacted cannot be identified by a valid identification code and an electronically transmitted personal identifier within 2 minutes after the contact, runners and/or law enforcement personnel shall be dispatched to the premises.

The telephone contact in (a) may be initiated by an authorized person at the protected premises.

34.2.3 revised January 12, 2007

34.2.4 If alarm verification is used, the declared alarm response time for the system shall not be extended.

34.2.5 If the runner(s) and the law enforcement agency having jurisdiction over the protected property have been dispatched and alarm verification is then properly obtained, they may be recalled. This is acceptable if the verification is obtained after the time limits specified in 34.2.2 and 34.2.3.

34.2.6 If a central-station uses alarm verification, the information required in 37.1(a) shall be recorded by an automation system that complies with Automation Systems, Section 14.

34.2.7 The alarm verification record shall be a part of the alarm record.

34.3 Investigation of a compromise attempt

34.3.1 A signal that indicates the possibility that an attempt is being made to compromise the protection at an installation having standard line security or encryption line security shall be treated as:

- a) An alarm condition if the system is closed and the protection is armed and
- b) A trouble condition if the system is open and the protection is disarmed. Such an indication can be a signal that indicates a compromise attempt, a momentary alarm, or any communication channel outage.

34.3.1 effective January 1, 1999

34.3.2 The source and cause of the compromise attempt shall be determined, if possible, and the protection system restored to normal. The subscriber shall be notified by telephone no later than the next working day and by a written report within two working days of the compromise attempt.

34.3.2 effective January 1, 1999

34.4 Investigation of a missing check-in signal

34.4.1 A missing check-in signal from a digital alarm communicator transmitter, one way radio (RF) transmitter, digital alarm radio transmitter, or any other alarm transmission device that is required to send a check-in signal, shall be investigated. If the system is:

- a) Open (disarmed), the missing signal shall be treated as a trouble signal and the subscriber shall be contacted by telephone with instructions to cause their transmitter to send a signal to the central-station.
- b) Closed (armed), the missing signal shall be investigated shall be conducted by a runner or serviceperson.

Exception: If the signal is not received, and the equipment provides for it, the central-station may contact the premises control and cause it to send a signal to the central-station whether the system is armed or disarmed.

34.4.1 effective January 1, 1999

34.4.2 The reasons for the missing check-in signal shall be determined and corrected, and a record of the results made.

34.4.2 effective January 1, 1999

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34.5 Multiplex communication channel disruption

34.5.1 If the central-station receives an indication that there is a disruption of a multiplex communication channel that serves multiple protection systems, the operators shall:

- a) Immediately contact the telephone company or other provider of the multiplex communication channel to determine the location of the disruption and to begin repairs;
- b) Determine which protection systems are out of service as a result of the disruption;
- c) Determine which of those systems do not have another method of signal transmission; and
- d) Contact those subscribers and advise them of the disruption.

34.5.1 effective January 1, 1999

34.5.2 After the out-of-service subscribers of systems with only the multiplex means of signal transmission have been contacted, the subscribers of systems that have another method of signal transmission shall be contacted and advised of the disruption.

34.5.2 effective January 1, 1999

34.6 Alarm response overruns

34.6.1 Not more than 20 out of every 100 alarm investigations shall exceed the maximum elapsed time specified in 31.1.1. This includes alarms for which a runner was not dispatched or did not arrive.

34.6.2 Elapsed time shall be determined by using the difference between the time recorded for the receipt of the alarm signal at the central-station, and the time recorded at the central-station as a result of a signal given by the runner representing the operating company upon arrival at the entrance of the subscriber's premises. See 34.1.1.

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34.7 Unwanted alarms

34.7.1 An alarm is a signal received at the central-station that requires immediate dispatch of either company runners, or a company runner and the law enforcement agency having jurisdiction over the property, and was caused by:

- a) Attempted burglary,
- b) Actual burglary, or
- c) Vandalism.

Other apparent alarm signals are unwanted alarms.

34.7.2 The central-station shall provide instructions to each authorized user of the alarm system on the proper operation of the system.

34.7.2 effective January 1, 1999

34.7.3 If an alarm system has more than four unwanted alarms caused by subscriber error in a 12-month period, the users of the alarm system responsible for the unwanted alarms shall be reinstructed on the proper operation of the alarm system. A record of the retraining shall be kept by the central-station.

34.7.3 effective January 1, 1999

34.7.4 If the cause for the unwanted alarm cannot be determined, a complete operational inspection shall be conducted to determine if any mechanical or electrical problems exist. A record of the inspection shall be kept by the central-station.

34.7.4 effective January 1, 1999

34.8 Signals from systems other than central-station burglar-alarm systems

34.8.1 When a signal is received from a system that is not a central-station burglar-alarm-type as defined by this standard, the operator shall notify the agency(s) or person(s) specified by the subscriber.

34.8.1 effective January 1, 1999

34.8.2 The station shall notify the alarm service company responsible for the alarm system of the alarm signal and the action taken in response to it. If the alarm service company is closed for business at that time, they shall be notified when they are next open for business.

34.8.2 effective January 1, 1999

35 Identification of Subscribers

35.1 During an investigation of an alarm or in response to a pre-arranged unscheduled opening (see Unscheduled, Section 32.4) runners shall obtain satisfactory evidence of the identity and authority of the subscriber, their employees, or others found on the premises, and shall obtain the signatures of such persons.

35.2 If a law enforcement agency is involved with the investigation, the runner or the central-station operator shall obtain and record the identity of law enforcement personnel by:

- a) Name and badge (or other) number,
- b) Squad number, or

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- c) Car number.

35.2 effective January 1, 1999

36 Handling of Subscriber's Keys

36.1 General

36.1.1 Each key or set of keys that will provide access to a subscriber's premises shall be maintained in a locked container. The locked container shall be located in an operating room, subsidiary station, runner station, runner's vehicle, in a key vault that is attached to the protected premises, or in a service center independent of a central-station or subsidiary station. Only authorized personnel shall have access to the keys for the container or key vault.

36.1.2 The name and address of the premises for which the keys provide access shall not appear on anything that is attached to or contains the keys.

36.1.3 Each key shall be maintained under a key management system that will provide an accurate record of when the keys were last used. Keys that have not been used for 12 consecutive months shall be functionally tested in the locks that they are intended to operate at the premises. Any key that does not function shall be returned to the subscriber the next day that they are open for business and a correct key requested. If a correct key is not obtained within 10 business days, the system shall be classified as a no-key system. Written notification of such reclassification shall be sent to the subscriber by mail, messenger or similar means.

36.1.4 When a key is used, the runner or other central-station representative that used the key shall leave a notice at the premises for the subscriber reporting that the key was used. The notice shall record the time and date that the key was used.

36.2 Key vaults

36.2.1 A key vault complying with the Standard for Antitheft Alarms and Devices, UL 1037, used to house keys to a subscriber's premises shall be securely attached to the building in which the protected premises is located. The opening of the key vault with or without the key, or its removal from its mounting, shall result in the transmission of an alarm signal to the central-station when the system is armed. When the system is disarmed, either a trouble or alarm signal shall be transmitted.

37 Records

37.1 Accurate records of the service provided by a central-station shall be kept for at least one year. Records shall include date and time entries and the following information (the date shall include the year which may be recorded using the last digit of the year only):

- a) Burglar-alarms signals:

- 1) Receipt of alarm;
- 2) Alarm verification (if used);
- 3) Dispatch of runners (including notification of the law enforcement agency having jurisdiction over the property);
- 4) Arrival of runner.

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- 5) Nature of the alarm;
 - 6) The name or employee identification of the runner(s) who are representatives of the alarm company;
 - 7) Identification of the law enforcement personnel involved (see 35.2);
 - 8) The designated response time;
 - 9) System identification by number or subscriber's name and address;
 - 10) Identification of the operator who processed the alarm;
 - 11) Identification of the subscriber notified of the alarm;
 - 12) Whether or not keys were used; and
 - 13) Identification of the subscriber or their employee(s) as specified in 35.1.
- b) Openings and Closing:
- 1) Scheduled opening and closing time and
 - 2) The actual opening and closing time.
- c) Irregular openings and closing:
- 1) The arranged irregular opening and closing time;
 - 2) The actual irregular opening and closing time; and
 - 3) The name of the subscriber or subscriber's representative making an irregular opening and closing.
- d) The use of the keys held or controlled by the central-station.
- e) Inspection, testing and maintenance:
- 1) Nature of service,
 - 2) Specific equipment inspected, tested, or serviced, and
 - 3) Name of central-station representative performing service.
- f) Any follow-up or additional action taken on unwanted alarms.

37.2 All such entries shall be made in ink on a physical medium or recorded into the non-volatile memory of an automation system from where they can be displayed and, if needed, printed on command. All times and dates shall be entered by time stamp or by an automation system.

38 Maintenance and Service

38.1 Contracts and agreements

38.1.1 All installations shall be maintained under a service contract or agreement with the alarm service company. They shall be inspected at intervals that will maintain the system in its intended operating condition. The interval between regular maintenance inspections shall not exceed 1 year. The regular maintenance inspection may be done in parts throughout the year.

38.2 Repairs

38.2.1 The alarm service company shall maintain a means of receiving requests for service at all times and shall keep a record of the time and date that:

- a) A service request is received,
- b) The service is initiated, and
- c) The repairs are completed.

Requests for service shall be received by alarm service company personnel, or a method shall be devised that will result in the initiation of service within the time interval indicated in 38.2.3.

38.2.1 effective January 1, 1998

38.2.2 The alarm service company shall provide the alarm service subscriber with written instructions on how to contact the company for service. The method of communication shall allow the subscriber to promptly report trouble conditions.

38.2.2 effective January 1, 1998

38.2.3 Repair services for a central-station burglar-alarm system shall begin not later than:

- a) One hour plus the designated response time for the system after the scheduled closing time for the system if the request for service is received while the protected property is open for business.
- b) One hour plus the designated response time after the request for service is received if the request for service is made as a result of trouble that has developed:
 - 1) At closing time,
 - 2) After the property has been closed and armed, or
 - 3) After an alarm investigation.

Exception No. 1: The beginning of repair service may be extended to the time that the protected property is next open for business if the subscriber to the alarm service provides written or oral authorization. Authorization shall be given to alarm service company personnel when the subscriber makes the decision to delay service. If authorization is given, the alarm service company shall make a record of:

- a) The time and date of the authorization,
- b) The name and identification code of the person giving the authorization, and
- c) The name and address of the company receiving alarm service.

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Exception No. 2: The beginning of repair service may be extended beyond the specified time if an authorized representative of the subscriber or the alarm service company remain at the premises until the arrival of the serviceperson.

38.2.3 effective January 1, 1998

39 Power Failure

39.1 If a central-station burglar-alarm unit at the protected premises receives primary power from a commercial source, standby power shall automatically maintain the unit in its intended operating condition when primary power is interrupted for:

- a) 4 hours, if a mercantile alarm is involved and
- b) 72 hours, if a bank-vault alarm is involved.

Exception: The standby power may maintain the unit for 24-hours, if the standby power source can be accessed while the bank vault is under timelock, and the standby power renewed.

39.2 If standby power is not provided as a part of the unit at the protected premises, a separate source of standby power shall be provided and connected to the terminals intended to be used for connection of standby power.

RESIDENTIAL MONITORING STATION

40 Residential Monitoring Station Operation

40.1 A residential monitoring station, shall be equipped with a cellular telephone or an equivalent means of voice communication that is independent of the telephone cable connected between the station and the serving wire center of the telephone company.

40.1 effective January 1, 1999

40.2 There shall be a written plan of action for the restoration of service by a station. The plan shall include the following:

- a) Foreseeable disasters: Possible natural and man-made disaster threats, national and local, that could effect the station.
- b) Emergency names list: A notification list that includes the names and the telephone numbers at work, home, vacation home, and the like, and home addresses of management, technical, operators, runners, and other relevant personnel.
- c) Equipment vender contacts: The 24-hour telephone and fax numbers of the vendors, technical assistance providers, and maintenance contractors of the equipment used in the station.
- d) Municipal agency contacts: Emergency telephone numbers for local municipal agencies, such as the fire and police departments, to be called for help.
- e) Utility contacts: Formalized emergency procedures and 24-hour contact names and telephone numbers of the utility and telephone companies serving the station.
- f) If an engine-driven generator(s) is used that requires on-site fuel storage, there shall be a 24-hours a day contact and telephone number for a source of fuel resupply.

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g) Relocation site: If a relocation site is provided for, information on the location of the site, how to get there, how to put the site into operation, and 24-hour emergency management contact names and telephone numbers.

40.2 effective January 1, 1999

40.3 Supervisory personnel and designated employees shall be made familiar with the plan and shall know the location of a copy of the plan that is kept at the station. The implementation of the plan shall be practiced annually to assure that all personnel know their responsibilities in case of an emergency.

40.3 effective January 1, 1999

40.4 The plan shall be reviewed and updated every six months and current copies shall be kept in designated and accessible locations.

40.4 effective January 1, 1999

41 Personnel (Operators)

41.1 The residential monitoring station shall have sufficient personnel (at least two persons), trained as operators, on duty at the station at all times to provide immediate attention to signals requiring action. No other operator activity shall take precedence over receiving and acting on these signals.

42 Signal Processing

42.1 When an alarm signal is received at a residential monitoring station from a residential burglar alarm system or other burglar alarm system, the operator shall notify:

- a) The law enforcement agency having jurisdiction over the protected property or
- b) The agency(s) or person(s) specified by the subscriber.

42.1 effective January 1, 1999

42.2 The station shall notify the alarm service company responsible for the alarm system of the alarm signal and the action taken in response to it. If the alarm service company is closed for business at that time, it shall be notified when it is next open for business.

42.2 effective January 1, 1999

43 Re-Transmission

43.1 A means shall be provided for the retransmission of burglar-alarm signals to law enforcement or other agency or individuals designated by the subscriber.

43.1 effective January 1, 1999

43.2 If telephone equipment is used as the means of retransmission, the residential monitoring station shall be equipped with a minimum of two telephone lines, each having its own telephone device, connected to the public switched telephone network.

43.2 effective January 1, 1999

43.3 If the method of retransmission utilizes the public switched telephone network, the correctness of the telephone number of each law enforcement or other agency, or individual designated by the subscribers to be contacted, shall be verified by calling each number every 12 months. All other methods of retransmission shall be tested every 7 days. A record of all such tests shall be maintained.

Exception: The telephone number of an individual designated to be contacted need not be verified if they are a secondary contact.

43.3 effective January 1, 1999

44 Records

44.1 All records shall be clearly legible. Each hand-written entry shall be made in ink.

44.1 effective January 1, 1999

44.2 Records of all alarms, troubles, and service calls shall be kept for 12 months at the residential monitoring station. Records of alarm and trouble signals shall be time and date stamped if recorded on a physical medium, or the information may be recorded into the non-volatile memory of an automation system with the date and time, from where it can be displayed and, if needed, printed on command.

44.2 effective January 1, 1999

44.3 The alarm record shall include the time and date of:

- a) The receipt of the alarm signal;
- b) Notification of the law enforcement agency having jurisdiction or other agency(s) or person(s) specified by the subscriber;
- c) Identification of law enforcement agency having jurisdiction or other agency(s) or person(s) specified by the subscriber; and
- d) Notification of the alarm service company responsible for the alarm system.

44.3 effective January 1, 1999

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APPENDIX A

Standards for Components

Standards under which components of the products covered by this standard are evaluated include the following:

Title of Standard – UL Standard Designation

Attachment Plugs and Receptacles – UL 498
Battery Chargers for Charging Engine-Starter Batteries – UL 1236
Building Construction and Materials, Fire Test of – UL 263
Building Materials, Test for Surface Burning Characteristics of – UL 723
Bullet-Resisting Equipment – UL 752
Burglary-Resistant Electric Locking Mechanisms – UL 1034
Busways and Associated Fittings – UL 857
Cables, Service-Entrance – UL 854
Cables, Thermoplastic-Insulated Underground Feeder and Branch-Circuit – UL 493
Central-Station Automation Systems – UL 1981
Central-Station Burglar-Alarm Units – UL 1610
Concrete Masonry Units – UL 618
Conduit, Flexible Metal – UL 1
Conduit, Intermediate Metal – UL 1242
Conduit, Liquid-Tight Flexible Steel – UL 360
Conduit, Rigid Metal – UL 6
Conduit, Schedule 40 and 80 Rigid PVC – UL 651
Conduit, Type EB and A Rigid PVC and HDPE – UL 651A
Control Units for Fire-Protective Signaling Systems – UL 864
Detectors, Single and Multiple Station Heat – UL 539
Detectors for Fire-Protective Signaling Systems, Heat – UL 521
Detectors for Fire-Protective Signaling Systems, Smoke – UL 268
Digital Alarm Communicator System Units – UL 1635
Door Assemblies, Fire Tests of – UL 10B
Door Frames, Fire – UL 63
Doors, Tin-Clad Fire – UL 10A
Emergency Lighting and Power Equipment – UL 924
Enclosures for Electrical Equipment – UL 50
Fire Extinguishers, 2-1/2-Gallon Stored-Pressure, Water-Type – UL 626
Fire Extinguishers, Carbon-Dioxide – UL 154
Fire Extinguishers, Dry Chemical – UL 299
Fire Extinguishers, Rating and Fire Testing of – UL 711
Fittings for Cable and Conduit – UL 514B
Glazing Material, Burglary Resisting – UL 972
Outlet Boxes, Flush-Device Boxes, and Covers, Nonmetallic – UL 514C
Outlet Boxes, Metallic – UL 514A
Power Outlets – UL 231
Power Supplies for Fire-Protective Signaling Systems – UL 1481
Power Units Other Than Class 2 – UL 1012
Protectors for Communications Circuits, Secondary – UL 497A
Protectors for Data Communications and Fire Alarm Circuits – UL 497B
Protectors for Paired Conductor Communications Circuits – UL 497
Raceways and Fittings, Cellular Metal Floor – UL 209
Raceways and Fittings, Surface Metal – UL 5

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Raceways and Fittings, Underfloor – UL 884
Roof Covering Materials, Tests for Fire Resistance of – UL 790
Roof Coverings, Materials for Built-Up – UL 55A
Sprinklers for Fire-Protection Service, Automatic – UL 199
Tanks for Flammable and Combustible Liquids, Steel Aboveground – UL 142
Tanks for Flammable and Combustible Liquids, Steel Underground – UL 58
Time-Indicating and -Recording Appliances – UL 863
Transient Voltage Surge Suppressors – UL 1449
Tubing, Electrical Metallic – UL 797
Underground Feeder and Branch-Circuit Cables, Thermoplastic-Insulated – UL 493
Uninterruptible Power Supply Equipment – UL 1778
Window Assemblies, Fire Tests of – UL 9
Wired Cabinets – UL 65
Wires and Cables, Thermoplastic-Insulated – UL 83
Wires and Cables, Thermoset-Insulated – UL 44
Wireways, Auxiliary Gutters, and Associated Fittings – UL 870

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APPENDIX B

PROCEDURES FOR ISSUING AND CANCELING CENTRAL-STATION ALARM CERTIFICATES

B1 Certificates

B1.1 Underwriters Laboratories Inc. (UL) under its Certificate Service program authorizes the issuance of certificates for central station fire alarm system installations which a Listed Alarm Service Company (ASC) represents to be in compliance with requirements established for the Category of service. An issued certificate indicates the type of service, extent of protection, name and location of protected property, period of issuance, and name and address of the ASC Service Center.

B1.1 added October 1, 1997

B1.2 An alarm system is considered to be Listed only if it is covered by a current certificate. Only those alarm system installations for which a certificate has been properly issued are covered under UL's Certificate Service. The verification of a certificate on "Underwriters Laboratories Certificate Verification Service" (ULCVS) is a method UL provides to identify certificated alarm systems actively covered under its Listing and Follow-Up Service.

B1.2 added October 1, 1997

B1.3 A certificate may also be verified by telephone if its serial number is known or the correct name, address, and zip code are known. Telephone UL's Northbrook, Illinois office and ask to be connected to the burglar and fire alarm certificate service.

B1.3 added October 1, 1997

B1.4 UL regularly counterchecks representative certificated alarm system installations of each ASC. Under the Follow-Up Service program UL Field Representatives conduct regular inspections and tests of representative alarm system installations to determine the correctness of installation of protective devices and wiring, quality of workmanship, operability of circuits, the maintenance procedures, and levels of protection. If an alarm system does not comply with UL's requirements it is subject to correction by the ASC or cancellation of the certificate.

B1.4 added October 1, 1997

B1.5 UL makes no representations or warranties, expressed or implied, that the alarm system will prevent any loss by fire, smoke, water or otherwise, or that the alarm system will in all cases provide the protection for which it is installed or intended. UL may at times conduct inspections of the ASC, including inspections of representative installations made by it. UL does not assume or undertake to discharge any liability of the ASC or any other party. UL is not an insurer and assumes no liability which may result directly or indirectly from inspection of the equipment, failure of the equipment, failure to conduct inspections, incorrect certification, nonconformity with the requirements, failure to discover nonconformity with the requirements, cancellation of the certificate or withdrawal of the ASC from inclusion in UL's Directory prior to the expiration date on the certificate.

B1.5 added October 1, 1997

B2 Forms and Instructions

B2.1 The following forms and instructions shall be used as required:

- a) Alarm System Certificate Request
- b) Alarm System Description

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c) Certificate Cancellation Request.

Copies of these forms and instructions may be ordered by using the "Certificate Service Forms Order Form" or by writing, faxing, or telephoning the certificate service at UL's Northbrook, Illinois office.

B2.1 added October 1, 1997

B3 Procedure For Issuing A Central-Station Alarm-System Certificate

B3.1 There are four steps to issuing a Central-Station Alarm-System Certificate as follows:

a) The ASC initiates the certificate-issuing process by executing the "Request for Certificate" form, and an "Alarm System Description" form. The original of the "Request for Certificate" shall be attached to the "Alarm System Description" and sent to the UL Northbrook Office for processing. For faster service, the ASC may fax a copy of the "Request for Certificate" and "Alarm System Description" forms. UL will then communicate a serial number to them. See Faster Service by Fax, Section B4.

b) When UL receives the original of both forms ("Request for Certificate" and "Alarm System Description"), a certificate will be printed after verifying that the information on the "Request for Certificate" form and "Alarm System Description" form, is correct. Thirty days before the issue date, UL sends the "Central Station Fire Alarm System Certificate" to the ASC. The certificate is then added to the "Master Certificate File" in a "pending" status.

c) The ASC signs the certificate and distributes it to the representative of the protected property.

d) On the issue date indicated on the request, UL will activate the Central-Station Fire-Alarm System Certificate, and the installation now becomes eligible for periodic review.

B3.1 added October 1, 1997

B4 Faster Service By Fax

B4.1 If the serial number of the certificate is needed sooner than would be possible by UL sending the Certificate through normal US mail service, UL provides for faster service through Speed Service. It can be used as follows:

a) After completing the "Request for Certificate" and "Alarm System Description" forms, FAX a copy of the forms to the Certificate Service Data Desk at Northbrook, Illinois. Phone the Northbrook office for the current fax number of the Burglar and Fire Alarm Certificate Service.

b) When the FAXed request is received, UL will then contact the Service Center by phone or FAX and provide the serial number of the certificate. UL will add this number to the "Master Certificate File" in a "Pending" status.

c) The ASC shall then add to the "Request for Certificate" and "Alarm System Description" forms, the serial number given to them by the data desk. The number is to be entered in the lower portion of the box in the upper right hand corner of each form.

d) The steps then proceed the same as described in the procedures for issuing a certificate in Section B3.

e) This service will normally be available during UL's business hours. Requests and descriptions received by 2:30 p.m. Central Time will be responded to that day. If received after 2:30 p.m., they will be responded to the next business day. The fax machines will receive transmissions at any time.

B4.1 added October 1, 1997

B5 Correction of Defects

B5.1 Should an inspection disclose that an alarm system does not comply with the NFPA 71 or NFPA 72 requirements in effect at the time of issuance of the certificate, the ASC shall correct the alarm system within 30 days of being notified of the defect. A serious defect shall be corrected immediately (within the service period indicated in 19.2.1). A written report on the actions taken to correct the defect shall be sent to UL. If the ASC fails to correct the defect, UL will cancel the certificate and notify the protected property of the action.

B5.1 added October 1, 1997

B5.2 Failure of the ASC to maintain an acceptable record of compliance with UL's requirements, shall warrant a special investigation of installation procedures and service. If improvement is not shown during the special investigation period, the ability to issue certificates will be suspended, or Listing for the service may be withdrawn.

B5.2 added October 1, 1997

B6 Master Certificate File

B6.1 A master file of all active certificates (AKA Certificate Service Database) is maintained by UL and is accessible by Insurance Companies and Authorities Having Jurisdiction through ULCVS, see B1.2.

B6.1 added October 1, 1997

B6.2 ASCs may also have access to computer generated lists of their active certificates. To obtain a list of certificates, an ASC must make this request in writing, and also indicate who is to receive the list. The ASC is limited to two requests per year as part of the normal certificate service. Additional copies will be provided for a nominal fee. Electronic-media copies are also available for a fee.

B6.2 added October 1, 1997

B7 Maintenance and Service

B7.1 An alarm system on which a Central Station Fire Alarm System Certificate is in effect, shall be under a maintenance and service contact or agreement with the ASC. A service contract or agreement shall be in effect as long as the certificate is in effect.

B7.1 added October 1, 1997

B7.2 An alarm system on which a Certificate is in effect, shall be inspected at intervals that are determined to be sufficient to provide continuous service. The interval between regular maintenance inspections shall not exceed 1 year. The inspection may be done in parts throughout the year.

B7.2 added October 1, 1997

B7.3 For other maintenance requirements, refer to the National Fire Alarm Code, NFPA 72 or the applicable edition of Signaling Systems for Central Station Service, NFPA 71.

B7.3 added October 1, 1997

B8 Service Area

B8.1 The limits of coverage, as determined by time for runner response, and for response time for service and maintenance, are based on identification of a service territory through the use of United States Post Office zip codes. An alarm service company selects those zip codes (areas) it will service, as verified through periodic audits of its response capability by Underwriters Laboratories Inc. The area coverage is defined by five digit or nine digit zip codes, or some of each. A response area need not include all zip codes within the general area. The zip code shall be for the physical address of a certificated installation.

B8.1 added October 1, 1997

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**Superseded requirements for
the Standard for
Central-Station Alarm Services**

UL 827, Sixth Edition

The requirements shown are the current requirements that have been superseded by requirements in revisions issued for this Standard. To retain the current requirements, do not discard the following requirements until the future effective dates are reached.

11.6 A subsidiary station shall be manned by qualified operating personnel within one hour after the central-station or residential monitoring station has determined that all contact has been lost and signals cannot be received from the subsidiary station.

11.9 The power and environmental control systems of a subsidiary station shall be monitored by the station that it is connected to.

11.10 A subsidiary station shall be inspected once a month by central-station or residential monitoring station personnel or their authorized agents to verify the operation of all equipment, telephones, battery conditions, fluid levels of the batteries and, if used, engine-driven generators.

11.12 There shall be a written plan of action for the restoration of service by a subsidiary station. The plan shall include the following.

- a) Foreseeable disasters: Possible natural and man-made disaster threats, national and local, that could effect the station.
- b) Emergency names list: A notification list that includes the names and the telephone numbers at work, home, vacation home, and the like, and home addresses of management, technical, operators, runners, and other relevant personnel.
- c) Equipment vender contacts: The 24-hour telephone and fax numbers of the vendors, technical assistance providers, and maintenance contractors of the equipment used in the station.
- d) Municipal agency contacts: Emergency telephone numbers for local municipal agencies, such as the fire and police departments, to be called for help.
- e) Utility contacts: Formalized emergency procedures and 24-hour contact names and telephone numbers of the utility and telephone companies serving the station.
- f) If an engine-driven generator(s) is used that requires on-site fuel storage, there shall be a 24-hours a day contact and telephone number for a source of fuel resupply.
- g) Relocation site: If a relocation site is provided for, information on the location of the site, how to get there, how to put the site into operation, and 24-hour emergency management contact names and telephone numbers.

11.13 Supervisory personnel and designated employees shall be made familiar with the plan and shall know the location of a copy of the plan that is kept at the station. The implementation of the plan shall be practiced annually to assure that all personnel know their responsibilities in case of an emergency.

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