

UL 1069

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Hospital Signaling and Nurse Call Equipment

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333 Pfingsten Road
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UL Standard for Safety for Hospital Signaling and Nurse Call Equipment, UL 1069

Sixth Edition, Dated March 29, 2001

Revisions: This Standard contains revisions through and including March 22, 2006.

SUMMARY OF TOPICS

This revision of UL 1069 includes the following changes in requirements: (1) Revise 5.5.2 to harmonize the requirement for the diameter of the rod used to evaluate ventilating openings with UL 60950-1 and (2) Revise the Impact Test, Section 39, to change the equivalents for the foot-pound measurements from newtons to joules and to correct the equivalent shown for the weight of the steel sphere.

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Text that has been changed in any manner is marked with a vertical line in the margin.

The revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated December 16, 2005.

The revisions dated March 22, 2006 include a reprinted title page (page1) for this Standard.

As indicated on the title page (page 1), this UL Standard for Safety is an American National Standard. Attention is directed to the note on the title page of this Standard outlining the procedures to be followed to retain the approved text of this ANSI/UL Standard.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ul/foreword.html>

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

New product submittals made prior to a specified future effective date will be judged under all of the requirements in this Standard including those requirements with a specified future effective date, unless the applicant specifically requests that the product be judged under the current requirements. However, if

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This Standard consists of pages dated as shown in the following checklist:

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1

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Sixth Edition

March 29, 2001

The most recent designation of ANSI/UL 1069 as an American National Standard (ANSI) occurred on March 17, 2006. The ANSI approval for this standard does not include Appendix A.

This ANSI/UL Standard for Safety, which consists of the Sixth Edition with revisions through March 22, 2006, is under continuous maintenance, whereby each revision is ANSI approved upon publication. Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. A UL Standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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INTRODUCTION

1 Scope

1.1 These requirements cover the individual units employed to form a hospital nurse call system (NCS) intended to provide audible and visual communication between patients and hospital personnel. They also cover miscellaneous signaling equipment employed in hospitals. Some examples include bedside tables, annunciators, power supplies for nurse call systems, and gas monitoring units.

1.2 The units covered by these requirements are intended to be installed in either general or critical care areas in accordance with the National Electrical Code, NFPA 70, and the Standard for Health Care Facilities, NFPA 99.

1.3 These requirements do not cover medical and dental equipment, line isolation monitors, X-ray equipment, electrically heated pads, therapeutic lamps, refrigerated oxygen therapy equipment, food warming cabinets and carts, equipment employed in inhalation anesthetizing or hazardous locations, office intercoms, or similar equipment and products covered by individual requirements. These requirements do not cover equipment employed in an area of hyperbaric oxygenation, in which a patient is exposed during oxygen therapy to pressures greater than ambient atmosphere.

1.4 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components generally used in the products covered by this standard.

2.1.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required 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 rating established for the intended conditions of use.

2.1.4 Specific components are 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.

2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.2.2 Unless otherwise specified, all voltages are rms.

2.3 Undated references

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

2.4 Maximum voltage and power

2.4.1 The maximum distribution voltage available to equipment intended to be installed in areas accessible to a patient or persons touching a patient is not more than 30 volts AC (42.4 volts peak), 42.4 volts peak for nonsinusoidal AC, or 42.4 volts continuous DC. The maximum power available to low-voltage equipment intended to be installed in areas accessible to a patient or persons touching a patient, shall not be greater than 100 volt-amperes. The maximum voltages to a pendant control circuit, where wet contact is likely to occur, shall not be more than 15 volts, 60 hertz sinusoidal, 30 volts continuous DC, 21.2 volts peak for nonsinusoidal ac, and 12.4 volts for DC that is interrupted at a rate of 10 – 200 hertz. See Voltage and Current Measurements, Section 19.

2.5 Manufacturer documentation of devices and operations

2.5.1 As part of each product submittal, the manufacturer shall provide documentation showing all elements which are conceivably capable of being connected to the NCS with core elements specifically identified, and the interconnection and function of each device also identified.

2.5.2 A fundamental device or operation, which has not been evaluated to the requirements of this standard, shall not replace a device that was evaluated and tested to the requirements of this standard as part of the NCS.

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3 Glossary

3.1 For the purposes of this standard the following definitions apply.

3.2 ALARMS – A signal, typically generated automatically, which annunciates an abnormal condition (e.g., the opening of an emergency-exit door or an unauthorized entry to narcotics storage).

3.2 added March 29, 2001

3.3 ANESTHETIZING LOCATION – Any area of a health care facility that has been designated for the administration, by inhalation, of any flammable or nonflammable anesthetic agent.

3.3 added March 29, 2001

3.4 ANNUNCIATOR – An electrically operated visual indicating appliance containing one or more identified lamps or targets each of which indicates a circuit condition or location, or both.

3.4 revised March 29, 2001

3.5 ANNUNCIATOR PANEL – A device that signals the presence and locations of calls or alarms in the system. It typically provides both audible and visual indications.

3.5 added March 29, 2001

3.6 AUDIO-VISUAL SYSTEM – A nurse call system that incorporates voice intercom between the nurse control stations and the patient-care areas (e.g., patient rooms, nurse lounges).

3.6 added March 29, 2001

3.7 BATH AREA – Any patient bathing or toilet area. See Wet Area, 3.94.

3.7 added March 29, 2001

3.8 BATH STATION – A call-initiating device located in a bath area to allow patients or staff to summon help. Typically activated by a pull cord.

3.8 added March 29, 2001

3.9 BATTERY BACK-UP – A battery source to power the nurse call system during power outages. Outages include complete failure or brown-out of the ac and the brief periods during switching between the main ac source and the hospital's standby power source. The battery back-up can be an integral part of the system or an optional add-on. The duration for which it will supply power is specified by the manufacturer.

3.9 added March 29, 2001

3.10 BEDSIDE STATION – See Patient Station, 3.66.

3.10 added March 29, 2001

3.11 CALL CORD – A cord with a switch at one end and a connector at the other that typically plugs into a patient station. The patient places a call to the nursing staff by momentarily pressing the switch. A call is automatically placed when the cord is removed from the station receptacle.

3.11 added March 29, 2001

3.12 CENTRAL EQUIPMENT – The components needed to process and distribute signals among nurse and patient stations and other peripheral devices. Typical components are low-voltage power supplies, logic and control circuits, and terminal blocks. This equipment is typically enclosed in a wall-mounted electrical enclosure that has been evaluated as suitable for this purpose and is located in an equipment room or closet.

3.12 added March 29, 2001

3.13 CENTRALIZED SYSTEM – A system whose operations are monitored and controlled from a central operators console. It includes peripheral stations installed in patient and staff rooms and related areas that are not normally visible from the central control point.

3.13 revised March 29, 2001

3.14 CIRCUIT, HIGH-VOLTAGE – A circuit having characteristics in excess of those of a low-voltage, power-limited circuit as defined in 3.15.

3.15 CIRCUIT, LOW-VOLTAGE (POWER-LIMITED) – A circuit involving a potential of not more than 30 volts AC, rms (42.4 volts DC or AC peak) and not providing more than 100 volt-amperes rated output.

3.16 CLASS 2 CIRCUITS – Circuits that conform to the Class 2 circuit requirements of Article 725 of NFPA 70, the National Electrical Code. Class 2 circuits are power-limited, either inherently or by a combination of protections against excessive current at the power source and in the circuit itself.

3.16 added March 29, 2001

3.17 CLASS 2 WIRING – Wiring that conforms to the Class 2 circuit requirements of Article 725 of NFPA 70, the National Electrical Code.

3.17 added March 29, 2001

3.18 CODE-BLUE CALL – See Code Call, 3.19.

3.18 added March 29, 2001

3.19 CODE CALL – A distinctive audible and visual signal representing a life-threatening situation that requires immediate action.

3.19 revised March 29, 2001

3.20 CODE-CALL SWITCH – A switch (typically wall mounted) used to place a code call.

3.20 added March 29, 2001

3.21 CODE-CALL SYSTEM – A system used to alert the necessary staff to a life-threatening situation requiring immediate action. It can be either a stand-alone system or a part of a nurse call system.

3.21 added March 29, 2001

3.22 COMPUTERIZED SYSTEM – A nurse call system that is controlled by a computer or an embedded microprocessor.

3.22 added March 29, 2001

3.23 CONVENTIONAL SYSTEM – A system containing one or more nurse master stations (typically one per floor or wing) that is attended by nursing personnel and installed in an area in which each patient room related to a particular nurse master is visible or readily accessible from that nurse master.

3.24 CORONARY CARE AREA – An area designated for the care of cardiac patients.

3.24 added March 29, 2001

3.25 CORRIDOR LAMP – A visual annunciator, mounted on the wall (or ceiling) outside a room, that indicates calling activities and the presence of staff members. It may have a single bulb or several bulbs of different colors to indicate the types of calls and staff members. Also referred to as a dome light.

3.25 added March 29, 2001

3.26 CRITICAL BRANCH CIRCUIT – A subsystem of the facility's emergency electrical system. Its feeders and branch circuits carry energy for functions related to patient care. During power outages, this subsystem is automatically connected to an alternate power source through one or more transfer switches.

3.26 added March 29, 2001

3.27 CRITICAL CARE UNIT (CCU) – An area where patients are subjected to invasive procedures and connected to line-operated, electro-medical devices. Examples are special care units, intensive care units, coronary care units, angiography laboratories, cardiac catheterization laboratories, delivery rooms, and operating rooms. Also referred to as an Intensive Care Unit (ICU).

3.27 added March 29, 2001

3.28 DAY/NIGHT TRANSFER – A feature that allows the staff in one nursing unit to temporarily (e.g. at night) answer calls from patients in a nearby nursing unit, in addition to their normally assigned calls.

3.28 added March 29, 2001

3.29 DOME LIGHT – See Corridor Lamp, 3.25.

3.29 added March 29, 2001

3.30 DUMMY PLUG – A connector without an active device that is plugged into the patient station's call-cord receptacle to prevent the station from automatically calling to indicate the absence of a call cord or pillow speaker.

3.30 added March 29, 2001

3.31 DUTY STATION – A station that uses tones and lamps to annunciate calls by their type or priority. It is normally installed in a location where nurses tend to be when they are not at the nurse control station or in patient rooms (e.g., clean linens, soiled linens, nurses' lounge).

3.31 added March 29, 2001

3.32 ELECTROSTATIC DISCHARGE (ESD) – The discharge of a voltage that is developed on both human bodies and objects with respect to a local electrostatic ground.

3.32 added March 29, 2001

3.33 EMERGENCY SIGNAL – An audible and visual signal that requires immediate action, but does not necessarily indicate a life threatening situation.

3.34 EMERGENCY SYSTEM – A system of feeders and branch circuits that can supply, within 10 seconds of a power interruption, alternate power to a limited number of prescribed functions vital to the protection of life and patient safety. It must meet the requirements of NFPA 70, Article 700.

3.34 added March 29, 2001

3.35 FIRE ALARM ANNUNCIATION – Alarm annunciation by a fire-alarm system which is determined to be appropriate for the intended use. See Supplementary Fire-Alarm Annunciation, 3.87.

3.35 added March 29, 2001

3.36 FIXED – Equipment that is intended to be permanently connected electrically.

3.37 FUNDAMENTAL DEVICE – A device which performs a fundamental operation. Devices which perform fundamental operations will not be evaluated as being capable of performing supplementary operations.

3.38 FUNDAMENTAL OPERATION – An essential/required operation whose primary function is to provide notification and/or reset/cancellation of a staff-initiated or patient-initiated call signal to alert the staff. These operations include all of the following:

- a) Call annunciation at a nurse's station (audible and visual),
- b) Call annunciation at the dome light,
- c) Call-placed indicator on the patient station (visual),
- d) Zone annunciation (audible and visual), and
- e) Call reset/cancellation.

An NCS must contain devices that perform all of these fundamental operations.

3.38 revised March 29, 2001

3.39 GENERAL CARE AREA – Patient bedrooms, examining rooms, treatment rooms, clinics, and similar areas in which it is intended that the patient shall come in contact with ordinary appliances, such as a nurse call system, electrical beds, examining lamps, telephones, and entertainment devices. The patients may also be connected to electro-medical devices, such as heating pads, electrocardiographs, drainage pumps, monitors, otoscopes, ophthalmoscopes, and intravenous lines.

3.39 added March 29, 2001

3.40 GERIATRIC CALL CORD – A call cord designed for patients who cannot easily manipulate a push-button. It normally has a pressure-pad switch in lieu of a push-button switch.

3.40 added March 29, 2001

3.41 GROUND FAULT – An unintended electrical connection to ground.

3.41 added March 29, 2001

3.42 GROUNDED CONDUCTOR – A system or circuit conductor that is intentionally grounded.

3.43 GROUNDING – A system of conductors that provides a low-impedance return-path for leakage and fault currents.

3.43 added March 29, 2001

3.44 GROUNDING CONDUCTOR – A conductor used to connect equipment or the grounded circuit of a wiring system to a grounded electrode or electrodes.

3.45 GROUNDING CONDUCTOR, EQUIPMENT – The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor or the grounding electrode conductor, or both, at the service equipment or at the source of a separately derived system.

3.46 HEADWALL – An assembly, usually prefabricated, set into the wall at the head of a patient's bed. It provides connections for, and helps integrate, a variety of systems, including medical gas, vacuum, electrical power, lighting, communications, and emergency signaling.

3.46 added March 29, 2001

3.47 INTENSIVE CARE UNIT (ICU) – See Critical Care Unit (CCU), 3.27.

3.47 added March 29, 2001

3.48 LEAKAGE CURRENT – Any current, including capacitively coupled currents, that may be conveyed from accessible parts of a product to ground or to other accessible parts of the product.

3.49 MASTER STATION (NURSE MASTER STATION) – See Nurse Control Station, 3.52.

3.49 added March 29, 2001

3.50 NITROUS OXIDE – A sweet-smelling gas used to induce the first and second stages of anesthesia. It can be a fire hazard.

3.50 added March 29, 2001

3.51 NURSE CALL SYSTEM – A system of components that provides audible and visual communication between patients and hospital personnel.

3.51 added March 29, 2001

3.52 NURSE CONTROL STATION – A component, intended to be located at the nurses' station, which provides audible tones and visual annunciation of incoming calls. Typically, it also provides audio communication between the nurse and the patient. Many other features are optionally available. Also called nurse master station.

3.52 added March 29, 2001

3.53 NURSING UNIT – An area of the facility that includes rooms for patients and the specific group of personnel dedicated to those beds.

3.53 added March 29, 2001

3.54 OVERCURRENT – Any current in excess of the rated current of equipment or the ampacity of a conductor. It may be caused by an overload, a short circuit, or a ground fault.

3.54 added March 29, 2001

3.55 OVERLOAD – The operation of equipment in excess of its normal, full-load rating, or of a conductor in excess of its rated ampacity to the degree that, when persisted for a sufficient length of time, will damage or dangerously overheat the equipment or wiring. A fault, such as a short circuit or a ground fault, is not an overload.

3.55 added March 29, 2001

3.56 OVERVOLTAGE – Any voltage that exceeds its rated or intended value.

3.56 added March 29, 2001

3.57 OXYGEN – An element that, at atmospheric temperature and pressures, exists as a colorless, odorless, tasteless gas.

Note: Its outstanding property is its ability to sustain life and to support combustion. Materials that burn in air will burn much more vigorously and create higher temperatures in oxygen or in oxygen-enriched atmospheres.

3.57 added March 29, 2001

3.58 OXYGEN-ENRICHED ATMOSPHERE – As defined in ANSI/NFPA 99, The Standard for Health Care Facilities, it is an atmosphere in which oxygen comprises more than 23.5 percent of the volume.

3.58 added March 29, 2001

3.59 PABX – A Private Automated Branch Exchange is the on-site central equipment that controls a facility's telephone equipment.

3.59 added March 29, 2001

3.60 PAGING SYSTEMS – A public address system sometimes associated with the nurse call system. This is not to be confused with a Radio Paging System, 3.76.

3.60 added March 29, 2001

3.61 PARALLEL CALL – A system that provides for one or more patient stations to simultaneously annunciate at more than one nurse control station.

3.61 added March 29, 2001

3.62 PATIENT BED LOCATION – The location of an inpatient sleeping bed or the bed or procedure table used in a critical-care area.

3.62 added March 29, 2001

3.63 PATIENT CARE AREA – Those areas, designated as follows, in accordance with the type of patient care anticipated.

a) Critical Care Area – Special care units, intensive care units, coronary care units, angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, and similar areas in which patients are intended to be subjected to invasive procedures and connected to line-operated, electro-medical devices.

b) General Care Area – Patient bedrooms, examining rooms, treatment rooms, clinics, and similar areas in which it is intended that the patient come in contact with ordinary products such as a nurse call system, electrical beds, examining lamps, telephone, and entertainment devices. In such areas, it may also be intended that patients be connected to electro-medical devices such as heating pads, electrocardiographs, drainage pumps, monitors, otoscopes, ophthalmoscopes, and peripheral intravenous lines.

c) Wet Location Area – Work area that is normally subject to wet conditions including standing water on the floor or routine dousing or drenching. Routine housekeeping procedures and incidental spillage of liquids does not constitute a wet location area.

3.64 PATIENT-CONTROLLED LIGHTING – Room and reading lights that can be regulated from the patient's bed.

3.64 added March 29, 2001

3.65 PATIENT MONITORING – The use of a nurse control station to monitor the sounds from one or more patient rooms.

3.65 added March 29, 2001

3.66 PATIENT STATION – A device located on the wall behind the patient bed that allows patients or staff to summon help. It is typically activated by a call cord or pillow speaker. It normally has a call-assurance lamp, which lights when a call is placed, and a reset switch for canceling a call. Common options include an intercom speaker/microphone and entertainment circuits for television control.

3.66 added March 29, 2001

3.67 PATIENT VICINITY – In an area where patients are normally cared for, the patient vicinity is the space with surfaces likely to be contacted by the patient or an attendant who can simultaneously touch the patient. In a typical patient room, this encloses a space not less than six feet (1.83 m) beyond the perimeter of the bed in its normal location, and extends vertically not less than seven feet (2.29 m) above the floor.

3.67 added March 29, 2001

3.68 PENDANT CONTROL – See Pillow Speaker, 3.70.

3.68 added March 29, 2001

3.69 PHYSIOLOGICAL MONITORING – A feature that enables the nurse control station to automatically signal alarms generated by remote, properly equipped physiological monitoring equipment which has been evaluated as suitable for the purpose.

3.69 added March 29, 2001

3.70 PILLOW SPEAKER – A pendant control similar to a call cord but with additional features such as a speaker for personal-entertainment audio (TV or programmed audio) and nurse communication, a volume control, an entertainment-channel selector, and lighting controls.

3.70 added March 29, 2001

3.71 PORTABLE – Equipment that is capable of being carried or conveyed.

3.72 POWER CONDITIONING – The process of regulating the 120-Vac electrical power to eliminate noise, hold the voltage within a specified tolerance, and hold the ac wave form within a specified tolerance, and hold the ac wave form to within a specified distortion limit.

3.72 added March 29, 2001

3.73 POWER SUPPLY – A unit that is used to condition the power for a nurse call system.

3.73 added March 29, 2001

3.74 PSYCHIATRIC STATION – The general term for stations designed for psychiatric areas. See under Secure Psychiatric, 3.77 – 3.79.

3.74 added March 29, 2001

3.75 QUALIFIED PERSON – One who is trained in the construction, system design, installation, testing, trouble-shooting, maintenance, and operation of the equipment and the hazards involved.

3.75 added March 29, 2001

3.76 RADIO PAGING SYSTEM – A system consisting of a radio-frequency encoder and a transmitter plus portable pagers (sometimes known as “beepers”).

3.76 added March 29, 2001

3.77 SECURE PSYCHIATRIC CEILING SPEAKER – A speaker, usually mounted in the ceiling with tamper-resistant hardware, that allows the staff to monitor the sounds in the room, especially when another staff member is attending the patient.

3.77 added March 29, 2001

3.78 SECURE PSYCHIATRIC EMERGENCY SWITCH – A temper-resistant switch mounted inside a secure psychiatric patient room. When enabled, it can be pressed by a staff member to signal an emergency. This switch cannot be reset from inside the patient room.

3.78 added March 29, 2001

3.79 SECURE PSYCHIATRIC HALL STATION – Located in the hall outside a psychiatric patient room, the hall station signals the nurse control station when a staff member is entering the psychiatric patient room so that it can be monitored. Frequently such a call also enables (i.e., arms) the psychiatric emergency switches in the room.

3.79 added March 29, 2001

3.80 SHOWER STATION – A pull cord activated and waterproof station that can be installed inside a shower stall and used by a patient to summon help.

3.80 added March 29, 2001

3.81 STAFF EMERGENCY STATION – A station that places “staff emergency” calls.

3.81 added March 29, 2001

3.82 STAFF LOCATOR STATION – A station at which hospital personnel (e.g. nurse, aide, or orderly) are intended to register their presence.

3.83 STAFF REGISTER STATION – A station that signals the type of staff (e.g. RN, LPN) present in a room.

3.83 added March 29, 2001

3.84 STAFF STATION – A station typically used by the staff to place calls to the nurse control station. It is typically located in staff areas but can also be located in areas used by ambulatory patients.

3.84 added March 29, 2001

3.85 STATIONARY – A cord-connected product intended to be fastened in place or located in a dedicated space.

3.86 SUPPLEMENTARY DEVICE – Any device that is electrically isolated, and not evaluated as a fundamental device.

3.87 SUPPLEMENTARY FIRE ALARM ANNUNCIATION – Annunciation not required by NFPA codes.

3.87 added March 29, 2001

3.88 SUPPLEMENTARY OPERATION – An operation that is adjunct to the fundamental operation, that failure of such will have no effect on the fundamental operation of the NCS.

3.89 SWING ROOM – A room whose patient station can selectively annunciate at a different nurse control station, typically in response to a change in the facility's patient load.

3.89 added March 29, 2001

3.90 TOILET STATION – A station in a toilet area that allows a patient to signal for help.

3.90 added March 29, 2001

3.91 UNGROUNDED SYSTEM – A system isolated from earth ground.

3.91 added March 29, 2001

3.92 UNINTERRUPTIBLE POWER SUPPLY (UPS) – A power supply that, when its input power is disrupted, will continue to supply power to the load for a prescribed period of time.

3.92 added March 29, 2001

3.93 VISUAL NURSE CALL SYSTEM – A nurse call system that annunciates calls by visually identifying the location or origin and sounding a tone, but which does not provide audio communication.

3.93 added March 29, 2001

3.94 WET AREA – Patient-care areas that are commonly wet while patients are present. These include standing fluids on the floor or the drenching of the work area where the fluids would likely come in contact with the patient or the staff. Areas that are routinely made wet by housekeeping procedures and incidental spills are not considered "wet".

3.94 added March 29, 2001

3.95 ZONE LAMP – This is similar to a corridor lamp, but it visually annunciates calls from a group of rooms in a particular area. Normally a zone lamp is located at corridor intersections where the observer cannot see the room corridor lamps.

3.95 added March 29, 2001

CONSTRUCTION

4 General

4.1 Except where indicated otherwise, the construction requirements specified in this standard as applying to nurse call system equipment, shall also apply to miscellaneous signaling equipment as defined in the Scope, Section 1.

4.2 Isolation shall be provided (see Abnormal Tests, Section 33) between any equipment, such as CRTs, printers, pocket page, telephone, and similar devices, and circuits extending into the patient care area stations so that, in the event of a breakdown between primary and secondary windings, the high-voltage does not appear on the patient circuits and the sum of leakage currents from the nurse call system and ancillary equipment does not exceed the limits of the leakage current test. See the Leakage Current Test, Section 28. The isolation shall be provided by physical separation, the use of optical isolators, or equivalent means.

5 Enclosures

5.1 General

5.1.1 Nurse call equipment shall be formed and assembled so that it has the strength and rigidity necessary to resist the abuses expected in service without:

- a) Impairing its operation,
- b) Total or partial collapse with resulting reduction of spacings,
- c) Loosening or displacement of parts, or
- d) Other serious defects.

5.1.2 All electrical parts of nurse call equipment shall be enclosed to reduce the chance of contact with uninsulated live parts. Functional openings, such as on receptacles and jacks, shall not be enclosed.

5.1.3 An enclosure shall have means for mounting. The means for mounting shall be accessible without disassembling any operating part of the unit. Removal of a completely assembled panel to mount the enclosure is not considered to be disassembly of an operating part.

5.1.4 A compartment enclosing electrical parts shall not be open to the floor or other support on which the unit rests.

Exception: This requirement does not apply to a nurse master station that rests on a table top.

5.1.5 Equipment shall be constructed so that spillage of foods or beverages, cleaning, and similar occurrences will not wet internal electrical parts.

5.1.6 An enclosure intended for recessed mounting and having a panel intended to be flush with the surface of a wall shall have no nonfunctional openings.

5.1.7 If a backbox is not provided with the unit, the minimum dimensions of the backbox in which the unit is intended to be mounted, as well as the minimum spacings from current-carrying parts of the unit to internal dead metal parts of the backbox, shall be specified in the installation instructions. The instructions shall specify the model number or minimum dimensions of custom backboxes intended to be used in the system.

5.2 Cast metal

5.2.1 The thickness of cast metal for an enclosure shall be as specified in Table 5.1.

Exception: Cast metal having a thickness 1/32 inch (0.8 mm) less than that indicated in Table 5.1 is to be used only if the surface under consideration is curved, ribbed, or otherwise reinforced, or if the shape or size of the surface is such that equivalent mechanical strength to an enclosure of the thickness specified in the table is provided.

5.2.2 When threads for the connection of conduit are tapped all the way through a hole in an enclosure wall, or when an equivalent construction is employed, there shall be at least 3-1/2 threads but no more than five threads in the metal, and the construction shall permit a standard conduit bushing to be attached.

5.2.3 When threads for the connection of conduit are tapped part way through a hole in an enclosure wall, there shall be at least five full threads in the metal, and there shall be a conduit stop having smooth, rounded edges for the protection of the conductors. The conduit stop shall have an inside diameter equal to that specified for a standard conduit bushing of the appropriate size.

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Table 5.1
Minimum thicknesses for cast-metal electrical enclosures

Use, or dimensions of area involved	Die-cast metal,		Cast metal of other than the die-cast type,	
	inch	(mm)	inch	(mm)
Area of 24 square inches (155 cm ²) or less and having no dimension greater than 6 inches (152 mm)	1/16	1.6	1/8	3.2
Area greater than 24 square inches or having any dimension greater than 6 inches	3/32	2.4	1/8	3.2
At a threaded conduit hole	1/4	6.4	1/4	6.4
At an unthreaded conduit hole	1/8	3.2	1/8	3.2

5.3 Sheet metal

5.3.1 The thickness of sheet metal employed for the enclosure of nurse call equipment shall be as specified in Table 5.2.

Exception: Sheet metal of two gage sizes less in thickness is not prohibited when the surface under consideration is curved, ribbed, or otherwise reinforced, or when the shape or size of the surface is such that equivalent mechanical strength to an enclosure of the thickness specified in the table is provided.

Table 5.2
Minimum thicknesses for sheet metal enclosures

Maximum enclosure dimensions				Minimum thicknesses								
				Steel						Brass or aluminum,		
Any linear dimension,		Area of any surface,		Zinc-coated,			Uncoated,					
inches	(mm)	inches ²	(cm ²)	inch	(mm)	GSG	inch	(mm)	MSG	inch	(mm)	AWG
12	305	90	584	0.035	0.86	20	0.032	0.81	20	0.045	1.14	16
24	610	360	2322	0.045	1.14	18	0.042	1.07	18	0.058	1.47	14
48	1219	1200	7742	0.056	1.42	16	0.053	1.35	16	0.075	1.91	12
60	1524	1500	9678	0.070	1.78	14	0.067	1.70	14	0.095	2.41	10
Over 60	1524	Over 1500	9678	0.097	2.46	12	0.093	2.36	12	0.122	3.10	8

5.3.2 At any point where conduit or metal-clad cable is to be attached, sheet metal shall be of such thickness or shall be so formed or reinforced that it will be equivalent in strength to any of the following:

- Uncoated flat steel not less than 0.032 inch (0.81 mm) thick,
- Galvanized steel not less than 0.034 inch (0.86 mm) thick, or
- Nonferrous metal not less than 0.045 inch (1.14 mm) thick,

and the construction shall permit a standard conduit bushing to be attached.

5.3.3 A plate or plug for an unused conduit opening or other hole in the ultimate enclosure, for a hole having a 1-3/8-inch (34.9-mm) maximum dimension, shall not be less than 0.027 inch (0.66 mm) thick when steel, or 0.032 inch (0.81 mm) thick when nonferrous metal.

5.3.4 A closure for a hole larger than 1-3/8 inch (34.9 mm) shall have a thickness equal to that required for the ultimate enclosure or a standard knockout seal shall be used. Such plates or plugs shall be securely mounted.

5.3.5 A knockout in a sheet metal enclosure shall be secured but shall be capable of being removed without undue deformation of the enclosure.

5.3.6 A knockout shall be provided with a flat surrounding surface for seating of a conduit bushing, and shall be located so that installation of a bushing at any knockout used during installation shall not result in spacings between uninsulated live parts and the bushing of less than those required in this standard.

5.4 Nonmetallic

5.4.1 An enclosure, or parts of an enclosure, of nonmetallic material shall have the mechanical strength and durability and be formed so that operating parts are protected against damage. The enclosure parts shall resist the abuses encountered during installation and use. The mechanical strength shall be at least equivalent to a sheet metal enclosure of the minimum thickness specified in Table 5.2. See also the Polymeric Materials Tests, Section 35.

5.4.2 Polymeric materials used for an enclosure shall comply with the following requirements:

- a) Enclosures containing parts involving a risk of fire: flammability rating of 5V; or flammability rating of V-0 and compliance with the 5-inch Flame Test as described in 36.4.1 – 36.4.6.
- b) Enclosures containing Class 2 and/or Class 3 circuits with a voltage not exceeding 30 volts AC, 42.2 volts peak, or 60 volts DC: flammability rating of V-2 or better; or flammability rating of HB, and compliance with the 3/4-inch Flame Test as described in 36.3.1 – 36.3.6.
- c) Enclosures containing circuits powered by batteries or with energy limited to 15 watts: flammability rating of HB or better.

5.4.3 The continuity of the grounding system of the equipment shall not rely on the dimensional integrity of the nonmetallic material.

5.4.4 If wood is used as the overall enclosure of equipment employed as part of a nurse call system, such as a bedside table, the current-carrying components shall be mounted on a metal chassis, box, plate, or similar mounting surface. All exposed live parts shall be totally enclosed and shall be inaccessible except for external user controls.

5.4.5 The thickness of the wood referenced in 5.4.4 shall be 1/4 inch (6.4 mm) minimum at the points of protection for current-carrying parts.

5.5 Ventilating openings

5.5.1 When ventilating openings are provided on an enclosure intended for recessed mounting with a front cover panel flush with the surface of the wall, the openings shall be on the front cover panel. When ventilating openings are provided on a surface-mounted enclosure, they shall be on the sides or front of the enclosure, or both.

5.5.2 Ventilating openings in an enclosure housing equipment other than that within reach of a patient or person touching a patient shall be of such size and shape that no opening will permit passage of a rod having a diameter of 5.0 mm. The ventilating openings include perforated holes, louvers, and openings protected by means of wire screening, expanded metal, or perforated covers.

5.5.2 revised March 22, 2006

5.5.3 Ventilating openings in an enclosure housing equipment that is intended to be installed within reach of a patient or a person touching a patient shall be of such size and shape that no opening permits passage of a rod having a diameter of 5/64 inch (2.0 mm).

5.5.4 An enclosure that houses fuses or any other overload protective device, and that is provided with ventilating openings, shall provide protection against the emission of flame or molten metal.

5.5.5 Perforated sheet metal and sheet metal employed for expanded-metal mesh shall be at least:

a) 0.046 inch (1.14 mm) thick if zinc-coated or 0.042 inch (1.07 mm) thick if not zinc-coated if the mesh openings or perforations are 1/2 square inch (320 mm²) or less in area and

b) 0.084 inch (2.13 mm) thick if zinc-coated, or 0.080 inch (2.03 mm) thick if not zinc-coated if the mesh openings or perforations are larger than 1/2 square inch.

Exception: If the indentation of a guard or enclosure wall does not alter the clearance between uninsulated live parts and grounded metal so as to affect the performance adversely or reduce spacings below the minimum values specified in Spacings, Section 14, the thickness shall not be less than 0.021 inch (0.53 mm) expanded metal mesh [0.024 inch (0.61 mm) if zinc coated] when:

a) The exposed mesh on any one side or surface of the device so protected has an area of no more than 72 square inches (464 cm²) and has no dimension greater than 12 inches (305 mm) or

b) The width of an opening so protected is not greater than 3-1/2 inches (90 mm).

5.5.6 The wires of a screen used in a ventilating opening shall not be smaller than No. 16 AWG (1.3 mm²) and the screen openings shall not be greater than 1/2 square inch (320 mm²) in area.

5.6 Covers

5.6.1 An enclosure cover shall be hinged, sliding, pivoted, or similarly attached to provide access to fuses or any other overcurrent protective devices, the intended protective functioning of which require renewal, or if it is necessary to open the cover in connection with the normal operation of the unit.

Exception: A hinged cover is not required when the fuse or fuses enclosed are intended to provide protection to portions of internal circuits, such as those employed on a separate printed-wiring board or circuit subassembly to prevent excessive circuit damage resulting from a fault. Such equipment shall be marked in accordance with 42.5.

5.6.2 With reference to 5.6.1, normal operation is considered to be operation of a switch for testing or for silencing an audible signal device, or operation of any other component of a unit that requires such action in connection with its intended performance.

5.6.3 A required hinged cover shall be provided with a latch, screw, or catch to hold it closed. The hinged cover of a unit intended to be installed where it will be accessible to other than authorized personnel shall be provided with a key lock or with a screw requiring a tool for removal.

5.6.4 An unhinged cover shall be securely held in place by screws or the equivalent.

5.7 Observation opening covers

5.7.1 A glass panel covering an observation opening of equipment not intended for location in a patient area shall be securely held in place so that it is not readily displaced in service and shall provide mechanical protection for the enclosed parts. The thickness of the glass panel shall be no less than that specified in Table 5.3.

Table 5.3
Minimum thickness of glass covers

Maximum size of opening				Minimum thickness of glass,	
Length or width,		Area,			
inches	(mm)	square inches	(cm ²)	inch	(mm)
4	102	16	103	1/16	1.6
12	305	144	928	1/8	3.2
Over 12	305	Over 144	928	a	

^a 1/8 inch or more, depending upon the size, shape, and mounting of the glass panel.

^a 1/8 inch or more, depending upon the size, shape, and mounting of the glass panel.

5.7.2 A glass panel for an opening having an area of more than 144 square inches (928 cm²), or having any dimension greater than 12 inches (305 mm), shall be supported by a continuous flange minimum 3/16-inch (4.8-mm) deep along all four edges of the panel.

5.7.3 A glass panel covering an observation opening of equipment intended for use in a patient area shall be of shatter-resistant "safety" glass or of plastic.