Plain Old Telephone Service (POTS) Copper Telephone Line Replacement Service Requirements and Options

Building Code Compliance Requirements	Reference	Potential Solution*	Comments or Considerations
Any combination of solutions in the right column may be used to address needs in the left column			
A. Fire Alarm Signaling Systems Requirements		**A. Fire Alarm Signaling Systems Potential Solutions (5 options)**	
Communications Integrity. Provision shall be made to monitor the integrity of the transmission technology and its communications path.	2013 NFPA 72, 26.6.3.1.4	OPTION 1: Continued use of POTS until service is discontinued***	•Unpredictable costs •Increased down time as repair response time lengthens •Unexpected and perhaps untimely termination of service •Increased expenses resulting from need for fire watches
Single Communications Path. Unless prohibited by the enforcing authority, governing laws, codes, or standards, a single transmission path shall be permitted, and the path shall be supervised at an interval of not more than 60 minutes. A failure of the path shall be annunciated at the supervision station within not more than 60 minutes. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15**.	2013 NFPA 72, 26.6.3.1.5	OPTION 2: Cellular telephone ***	•Possible additional antenna and/or signal boosters •Back-up battery requirements •Technology obsolescence with evolving cellular networks (i.e. 4G, 5G) •Interface to answering station at communications center
Multiple Communications Paths. If multiple transmission paths are used, the following requirements shall be met: (1) Each path shall be supervised within not more than 6 hours. (2) The failure of any path of a multipath system shall be annunciated at the supervision station within not more than 6 hours. (3) The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15**.	2013 NFPA 72, 26.6.3.1.6	OPTION 3: IP/VoIP*** (Obtained from a private service provider or over owner's network)	•If over owner's network, requires engagement and agreement from IT •Back-up battery requirements including generator with UPS as needed to carry the system load during power transfer •Interface to answering station at communications center
Single Technology. A single technology shall be permitted to be used to create the multiple paths provided the requirements of 26.6.2.1.6(1) through (3) above are met. When considering a fire alarm system utilizing a single communication path to the supervising station, consideration should be given to the risk exposure that results from the loss of that path for any period of time and for any reason. Some of these outages can be regular and predictable and others transitory.	2013 NFPA 72, 26.6.3.1.7, A.26.6.3.1.7		
Secondary Power. **Premises Equipment.** Secondary power capacity for all equipment necessary for the transmission of alarm, supervisory, trouble, and other signals located at the protected premises shall be as follows: (1) Fire alarm transmitters not requiring shared on-premises communications equipment shall comply with 10.6.7. (2) If the fire alarm transmitter is sharing on-premises communications equipment, the shared equipment shall have a secondary power capacity of 24 hours. Exception: Secondary power capacity for shared equipment shall be permitted to have a capacity of 8 hours where acceptable to the authority having jurisdiction and where a risk analysis is performed to ensure acceptable availability is provided. This requirement is to ensure that communications equipment will operate for the same period of time on secondary power as the alarm control unit.	2013 NFPA 72, 26.6.3.1.15, 26.6.3.1.15.1, A.26.6.3.1.15	OPTION 4: Radio	•Possible additional antenna •Back-up battery requirements •Interface to answering station at communications center •May not be viable for institutions using remote monitoring
Supervising Station. Secondary power capacity for all equipment necessary for reception of alarm, supervisory, trouble, and other signals located at the supervisiong station…shall comply with 10.6.7. Note: Section 10.6.7 Secondary Power Supply requires the supply be sized to match the operating charactersitics of the fire protection system and requires physical protection of the system. In short, battery size is a minimum of 24 hours of backup plus time for the alarm to activate and evacuate the building (24 hours standby plus 5 minutes for alarm if horn/strobe or 15 if voice evacuation, as typically used in large or high rise facilities).	2013 NFPA 72, 26.6.3.1.15.2	OPTION 5: Local Dedicated Phone Service	•Unpredictable costs •Unpredictable/inconsistent service availability •Fire alarm industry may be moving away from telephone communication technology

***See 2013 NFPA 72, 10.15 for additional details on the treatment of trouble signals, required notifications, restoration to normal, deactivation, etc.*

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****POTS, cellular, or IP, either singularly or combined, are the expected options for alarm installations reporting to the State Capitol Police (SCP) receiving station in Raleigh. Until a way of accepting cellular calls at the receiving station can be determined, the cell call would be required to route to a private, UL-listed receiving station, and the building owner would pay a monthly monitoring fee to that private service provider, in addition to the cellular bill for each line installed.* *Similarly, fire alarm installations outside State Capitol Police service area to be served directly by a private UL-listed central receiving station would face comparable pricing structure (cellular lines plus monthly monitoring fees).*			
B. Elevator Requirements		**B. Elevator Potential Solutions**	
Existing elevators currently in operation must comply with requirements for two-way communication as approved upon installation. Communication requirements for Elevators are listed in ASME A17.1 section 2.27.1 "Car Emergency Signaling Devices." This section is significantly different between the 2013 edition and the 2019 edition.**** Elevators permitted since June 30, 2020 must comply with the 2019 edition, which requires both text and video communications, as well as individual pathways to each elevator to permit offsite communication monitors to call back to the specific elevator initiating an emergency call.	ASME A17.1, Section 2.27.1	Any of the service options under Section A., above, may address communications requirements.	•Considerations noted for solutions under Section A. should continue to play a role in service decisions. •The Department of Labor **may** determine that a change in telephone service triggers a full communications upgrade, compliant with the 2019 edition of ASME A17.1. •Service replacement options for copper telephone lines which require the replacement of the telephone handset or call button within the elevator cab will likely trigger the requirement to comply with the 2019 edition. •Compliance with the 2019 edition of ASME A17.1 may be more readily addressed using cellular or IP solutions. •While individual communications lines to each elevator cab were not required prior to 2016, it is recommended that any replacement meet the single-line standard (a line dedicated to each elevator cab) currently required. •Back-up power load must address power for the cellular or IP equipment and all associated switches required to achieve communication, where those options are used.
Auxiliary power with a minimum of 4 hours of back up power is required on loss of normal power.	ASME A17.1, Section 2.27.1.1.5		
*****References and recommendations are intended to address copper telephone line replacements in existing elevators only. Requirements regarding electrical wiring, fire alarm services in elevator areas, and new or elevator modernization installations are beyond the scope of this document.*			
C. Areas of Refuge Requirements		**C. Areas of Refuge Potential Solutions**	
Areas of refuge shall be provided with a two-way communication system complying with Sections 1009.8.1 and 1009.8.2.	NC Bldg. Code 1009.6.5	Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	•Considerations noted for solutions under Section A. should continue to play a role in service decisions. Back-up power support is critical to provide for on-going two-way communications. •Particularly note additional automatic dial-out and signage requirements.
The area of refuge emergency communications sytem includes remotely located area of refuge stations and a central control point which must communicate with each other.	2013 NFPA 72, 24.5.3, including 24.5.3.2 and 3		
The physical location of the central control point shall be designated by the building code in force or the authority having jurisdiction (see item 4, below).	2013 NFPA 72, 24.5.3.5, NC Bldg. Code 1009.8.1		
Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department (per NC Bldg. Code). Where the central control point is not a constantly attended location, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 9-1-1 (NC Bldg. Code), where responsible personnel can initiate the appropriate response (2013 NFPA 72, 24.4). The two-way communication system shall include both audible and visible signals.	NC Bldg. Code 1009.8.1, 2013 NFPA 72,24.5.3.4		
The area of refuge station shall provide for handsfree two-way communication, provide an audible and visible signal to indicate communication has occurred and indicate to the receiver the location sending the signal.	2013 NFPA 72, 24.5.3.6		

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Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Signage shall comply with the ICC A117.1 requirements for visual characters.	NC Bldg. Code, 1009.8.2		
Instructions for the use of the two-way communications sytem, instructions for summoning assistance via the two-way communications system, and written identification, included in braille, of the location shall be posted adjacent to the two-way communications system.	2013 NFPA 72, 24.5.3.7 See also NC Bldg. Code 1009.8.2 referenced above.		
D. Duress Alarms (Panic Buttons) Requirements		**D. Duress Alarms (Panic Buttons) Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal, contract/grant or other requirements . Duress alarms are often integral to building security systems.		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	
E. Building Security Systems Requirements		**E. Building Security Systems Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal, contract/grant or other requirements .		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	
F. Building Monitoring and Controls Requirements		**F. Building Monitoring and Controls Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal, contract/grant or other requirements.		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	
G. Emergency Bluelight Phones Requirements		**G. Emergency Bluelight Phones Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal or contract/grant requirements. Requirements should be at least comparable to two-way voice communication required for elevators beginning in 2016.		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	
H. Emergency Generator Monitoring and Alarms Requirements		**H. Emergency Generator Monitoring and Alarms Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal or contract/grant requirements or requirements associated with regulated programs such as hospitals and nursing homes.		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	
I. Emergency Response Centers Requirements		**I. Emergency Response Centers Potential Solutions**	
No building code requirements. Absent building code requirements, an implied obligation for monitoring and response may exist. Requirements subject to standards set by the agency or institution and any program requirements such as those involving federal, contract/grant or other requirements .		Any of the service options under Section A., above, may be used as best fits the agency or institution's circumstances.	

NOTE: Healthcare facilities requiring federal certification under the 2012 life safety code are currently required to be served by two individual copper (plain old telephone service/POTS) lines. Appropriate resolution must be pursued with the applicable certification agency.

*Any solution must be reviewed and approved by the State Construction Office, as the authority having jurisdiction, prior to installation.

Plain Old Telephone Service (POTS) Copper Telephone Line Replacement Resources

The following individuals have agreed to be available to share their technical knowledge and lessons from experience. Requests may be made to any of these experts and need not be limited to requests made from the organizations with which they are associated.

State Construction Office

Bob Talley, Assistant Director, Consulting Services Section, robert.talley@doa.nc.gov, 984-236-5441
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UNC System

East Carolina University
Linwood Hines, Life Safety Supervisor, hinesl@ecu.edu, 252-328-2793

North Carolina State University
Greg Sparks, Communications Technologies, Assistant Vice Chancellor, gwsparks@ncsu.edu, 919-515-0105

UNC-Chapel Hill
David Sharpe, Life Safety Supervisor, david.sharpe@fac.unc.edu, 919-843-8997

North Carolina Community College System

Wake Technical Community College
Gary White, Director of Infrastructure and Operations, gtwhite@waketech.edu, 919-866-5048

Durham Technical Community College
Erik Townsend, Assistant Director of Facility Services, townsended@durhamtech.edu, 919-536-7261 x 6201