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Purpose: This document refers to the Fire Department Technology Management Bulletin 1 of 2011, which provides the performance and filing requirements for an in-building radio communication system that is installed pursuant to Exception 1 of section BC 907.2.12.3.

Related Code/Zoning Section(s), Bulletin(s):

BC 907.2.12	FDNY Technology
BC 907.2.12.3	Management Bulletin 1 of 2011
FC 404.3.1	

Subject(s): High-rise buildings, fire department communication system; High-rise buildings, fire department radio system; In-building radio communication system

For buildings that are subject to section BC 907.2.12, where fire department communication systems are required, fire department radio systems (“in-building radio communication system”) may be provided in lieu of the required fire department communication systems pursuant to section BC 907.2.12.3, Exception 1. Where such radio systems are elected, applicants shall be guided by Fire Department Technology Management Bulletin 1 of 2011, which is attached hereto.



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TECHNOLOGY MANAGEMENT BULLETIN # 01/2011

RE: This document represents the performance requirements for an in-building radio system to be installed at Hi-Rise or large footprint buildings to be provided by the Building Owner/Management. FDNY channel frequencies will be provided upon agreement to install repeater/simplex system.

1. Fire Department In-Building Auxiliary Radio Communication Systems

1.1 Scope

1.1.1 Exceptions Exception No. 1 of BC 907.2.12.3 allows for Fire Department radio systems where approved by the Fire Department may be installed in lieu of a two-way Fire Department communication system. However, in this regard there are no guidelines for building owners, engineers, designers, installers, etc. to follow when proposing to comply with this exception.

1.1.2 General

1.1.2.1 Non-Interference No amplification system capable of operating on frequencies or causing interference on frequencies assigned to the jurisdiction by the Federal Communications Commission (FCC) shall be installed without prior coordination and approval of the FDNY. The building manager/owner shall suspend and correct other equipment installations that degrade the performance of the public safety radio system or Fire Department In-Building Auxiliary Radio Communication System.

1.1.2.2 Approval and Permit Plans shall be submitted for design approval prior to installation. At the conclusion of successful acceptance testing, a renewable permit shall be issued for the Fire Department Auxiliary Radio Communication System by the FDNY.

1.2 Coverage Areas

1.2.1 Radio Coverage Radio coverage shall be provided throughout the building as a percentage of floor area, as stated in 1.2.2 through 1.2.3.

1.2.2 Critical Areas Critical areas, such as the Fire Command Center(s), the fire pump room(s), exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and mechanical rooms not accessible to the public, shall be provided with 97 percent

floor area radio coverage.

1.2.3 General Building Areas General building areas in buildings constructed under the 2008 Building Code shall be provided with 97 percent floor area radio coverage. General areas in existing buildings built prior to the 2008 Building Code shall be provided with 97 percent floor area radio coverage.

1.2.4 Amplification Components Buildings and structures that cannot support the required level of radio coverage shall be equipped with a radiating cable system and/or a distributed antenna system (DAS) with FCC certified signal boosters or systems otherwise approved in order to achieve the required adequate radio coverage.

1.3 RF Signal Strength

1.3.1 In-Building Coverage Coverage shall be -93 dBm over 97% of each floor, with 95% reliability, measured at the input of the receiver as worn and operated during typical fire and rescue operations, and provide an intelligible delivered audio quality (DAQ) of 3.4 or better in accordance with the published public safety standards TIA/TSB-88B.

1.3.2 Perimeter External perimeter coverage at street level shall be limited to one-block radius. This coverage shall be present at all sides of the facility.

1.3.3 Uplink vs. Downlink Radio coverage must be balanced uplink vs. downlink. In any area that a portable radio can receive, it must be able to access the system transmitting at a minimum 2 watt power.

1.3.4 Equipment The completed equipment, antenna and radiating cable installation must comply with fixed site installation standards, including all lightning protection and grounding requirements.

1.4 System Frequency Technicalities

1.4.1 System Frequencies The Fire Department In-Building Auxiliary Radio Communication System shall be capable of transmitting all Fire radio frequencies assigned to the jurisdiction and be capable of using any modulation technology.

1.4.2 List of Assigned Frequencies The FDNY channel frequencies will be provided upon agreement to install Repeater/Simplex System. Repeater/Simplex System shall be capable of 25/12.5 kHz (Analog and Digital) operation to meet present requirements as well as new and future FCC imposed narrow band operations.

1.4.3 Frequency Changes Systems shall be capable of upgrade to allow for instances where the jurisdiction changes or adds system frequencies, in order to maintain radio system coverage as originally designed.

1.4.4 Signaling (i.e. Motorola MDC and Trunk Signaling Block TSBK)

Repeater: Signaling transmitted by the portable radios for ID and Emergency Alert signals shall pass through the repeater and rebroadcast to all receiving radios.

Simplex System: Signaling transmitted by the portable radios for ID and Emergency Alert signals shall be displayed at the console radio of a simplex system.

1.5 System Components

1.5.1 Component Approval Components utilized in the installation of the Fire Department In-Building Auxiliary Radio Communication System, such as repeaters, transmitters, receivers, signal boosters, cabling, and fiber distributed antenna system shall be **FCC compliant** and shall be compatible with the FDNY radio system.

1.5.2 Component Enclosures Where equipment is subject to environmental or mechanical exposure, all repeaters, transmitter, receiver, and signal booster components shall be **housed** in a NEMA 4 or 4X type enclosure(s).

1.5.3 Labeling FDNY cabling shall be permanently labeled and identified as “**FDNY Communications Use**”.

1.5.4 Signal Booster Components If used, signal boosters shall meet the following requirements, as well as any other requirements determined by the FDNY Bureau of Technology Development and Systems (BTDS):

1. Signal boosters shall have FCC certification prior to installation.
2. All signal boosters shall have both analog and digital communications compatibility at the time of installation.
3. The signal booster delay shall not cause Time Domain Interference (TDI) perceptible to the human ear.

1.5.5 Power UPS/Generator power redundancy shall be provided in accordance RCNY 4000-06 (NYC Electrical Code for Fire Alarm). The Fire Department In-Building Auxiliary Radio Communication System including all its active components shall be equipped with a secondary source of power. The secondary source of power shall be a battery system. In addition to the battery system where the building is equipped with an emergency generator, it shall supply power to the Fire Department In-Building Auxiliary Radio Communication System. The secondary power supply shall supply power automatically when the primary power source is lost. The battery power source shall be capable of operating the Fire Department In-Building Auxiliary Radio Communication System for a period of at least 12 hours. The transfer switch used for the fire alarm system may be used for the Fire Department In-Building Auxiliary Radio Communication System.

1.6 Radio Consoles

1.6.1 Dedicated Radio Console Provision shall be made available at the Fire Command Center for FDNY use of two sets of frequencies for a repeater system and a minimum of 2 frequencies for a simplex system, as required by section 1.4. A console shall be hardwired and provide voice override control of the Repeater/Simplex System at the Command Post. A system ON/OFF switch shall be located in proximity to the Fire Alarm Control Panel/Elevator Control Panel. FDNY 2642 key shall be used to activate the Repeater/Simplex System and the key shall remain in a captured mode while Repeater/Simplex System is on. The Fire Department In-

Building Auxiliary Radio Communication System shall include automatic supervisory and trouble signals for malfunctions of the signal booster(s) and power supplies as follows:

1. Normal AC power
2. Loss of normal AC power
3. Low battery capacity

1.7 Filing/Inspection, Testing/Maintenance and OOS Systems

1.7.1 Filing Before any work can precede the Building Owner/Management shall file design plans with the Dept of Buildings and the FDNY in accordance with the following:

Systems shall be filed in accordance with the 2008 New York City Construction Code to comply with 907.2.12.3-Exception 1 entitled **Fire Department Auxiliary Communication System**

- a. Plans and specifications shall be filed with the NYCDoB pursuant to BC907.1.1
- b. Docketed plans shall be filed with the FDNY plan examination unit in accordance with the requirements of the Bureau of Fire Prevention FC 907.1.1.
- c. Upon plan review and approval a permit shall be issued to allow installation.
- d. Upon completion of the installation the contractor shall file an A433r, including a test report requesting a FDNY test and inspection.
- e. Upon FDNY acceptance a Letter of Approval shall be issued.

1.7.2 Technical Criteria The FDNY will maintain a document of technical information specific to its requirements. This document shall contain, as a minimum the following:

1. Frequencies required.
2. Location and effective radiated power (ERP) of radio sites used by the Fire Department Auxiliary Radio Communication System.
3. Maximum Time Domain Interference (TDI).
4. Other supporting technical information necessary to direct system design.

1.7.3 Acceptance Testing Before final approval is issued, the Fire Department In-Building Auxiliary Radio Communication System shall be subject to a formal Acceptance Test Plan (ATP) of all components and the system as a whole; said plan to be developed to the satisfaction of the FDNY. The ATP shall ensure that two-way coverage on each floor of the building meets the minimum coverage requirements of 1.2.1 and 1.2.2 and 1.3.1.

The ATP shall consist of the following items:

1. RSSI-Radio Signal Strength Index
2. DAQ-Delivered Audio Quality
3. Console Test (i.e. lights, audio, etc)

The Building Owner/Management shall provide the FDNY with a complete set of as built design drawings of all components of the system before FDNY final approval is issued.

1.7.4 Maintenance and Operational Testing The Building Owner/Management shall be responsible for the maintenance and testing of the Fire Department In-Building Auxiliary Radio Communication System. The continuing reliability and the integrity of the system is dependant on an established program of routine maintenance and operational testing. The system shall be tested daily. A written (log book) record of inspections, tests, exercising, operation and repairs shall be maintained on the premises. The log must be made readily available at all times on the premises to any representative of the FDNY and shall include:

1. Recording of the daily test findings.
2. The date of the maintenance report.

3. Identification of the servicing personnel.
4. Notification of any unsatisfactory condition and the corrective action taken, including parts replaced.

1.7.5 Annual Certification Where a Fire Department In-Building Auxiliary Radio Communication System is approved, it shall be the building owner's responsibility to have all components of the system tested and certified every 12 months. The annual certification will require the building owner/management to submit copy of the certification by the manufacturer and or the maintenance company to the FDNY High-Rise Unit during the scheduled annual inspection, pursuant to FDNY Fire Code Section FC 106 and Appendix A, Section FCA01 (27).

1.7.5.1 Routine Use The FDNY reserves the right to request testing of the system by local FDNY units for training and familiarization.

1.7.6 Five (5) year Agency Certification Where a Fire Department In-Building Auxiliary Radio Communications System is approved, it shall be subjected to an agency certification of all components of the system every 5 years.

1.7.7 Manuals, Special Tools, and Spare Parts The building owner shall maintain an instruction manual for all components of the Fire Department In-Building Auxiliary Radio Communication System. The manual shall consist of:

1. A detailed explanation of the operation of the system.
2. Instructions for routine maintenance.
3. An illustrated parts list and part numbers.
4. Illustrated and schematic drawings of components, including operating and safety devices, control panels, instrumentation, and annunciators.

Any special tool(s) and testing devices required for routine maintenance shall be available for use when needed. Consideration shall be given to stocking spare parts as recommended by the manufacturer.

1.7.8 Out of Service Systems The Building Owner/Management shall insure FDNY procedures as delineated in section 901.7 of the Fire Code is implemented.

Addendum: Standards researched in the development of this guide.

New York City Building Code 2008

Chapter 9 Fire Alarm Systems and Appendix Q

Chapter 33 Safeguards during Construction and Demolition

New York City Fire Code

Chapter 14 Fire Safety during Construction, Alteration, and Demolition

International Fire Code 2009

Chapter 5 Fire Service Features

Appendix J Emergency Responder Radio Coverage

NFPA 1 Fire Code 2009

Chapter 16 Safeguards During Building Construction, Alteration, and Demolition Operations

Annex O In-Building Public Safety Radio Enhancement System

NFPA 72 National Fire Alarm and Signaling Code 2010

Chapter 14 Inspection, Testing and Maintenance

Chapter 24 Emergency Communications Systems (ECS)

NFPA 101 Life Safety Code 2009

Chapter 9 Building Service and Fire Protection Equipment

NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations 2009

Chapter 7 Fire Protection

Chapter 8 Safeguarding Construction and Alteration Operations

Chapter 10 Safeguarding Demo Operations

NFPA 5000 Building Construction and Safety Code 2009

Chapter 55 Fire Protection System and Equipment

Annex G In-Building Public Safety Radio Enhancement System