

Update on UL 2524, Standard for In-Building 2-Way Emergency Radio Communications Enhancement Systems

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Background on ERECS

- Portable Land Mobile Radios (LMRs) are an essential life-safety tool for firefighters
- Many buildings prevent the receipt or transmission of LMR messages based on construction elements and/or building configuration
- ERCES provide assurance that emergency messages can be transmitted and received into and out of every building
- ERCES do not rely on alternate communication equipment or fixed locations from which to transmit



Background on ERECS

Code Requirements – ICC and NFPA

NFPA 72 and NFPA 1221

The 2016 edition of NFPA 1221 includes Section 9.6 (Two-Way Radio Communication Enhancement Systems) with technical requirements for design, installation and performance generally consistent with the 2018 IFC Section 510.



Background on ERECS

Code Requirements – ICC and NFPA

NFPA 1 Fire Code

- First introduced in 2012 edition
- All buildings to have *approved* radio coverage for emergency responders available throughout the interior of building at a level determined by the AHJ.
- References NFPA 72 and NFPA 1221



Background on ERECS

Code Requirements – ICC and NFPA

International Fire Code (IFC) Section 510

- First introduced in 2009 edition
- All new buildings to have *approved* radio coverage for emergency responders available throughout the interior of building at the same coverage levels that existed outside the building
- References NFPA 72 and NFPA 1221



UL 2524

December 2017: UL 2524 published as an Outline of Investigation

Spring 2018: Standards Technical Panel (STP) formed for US/CAN

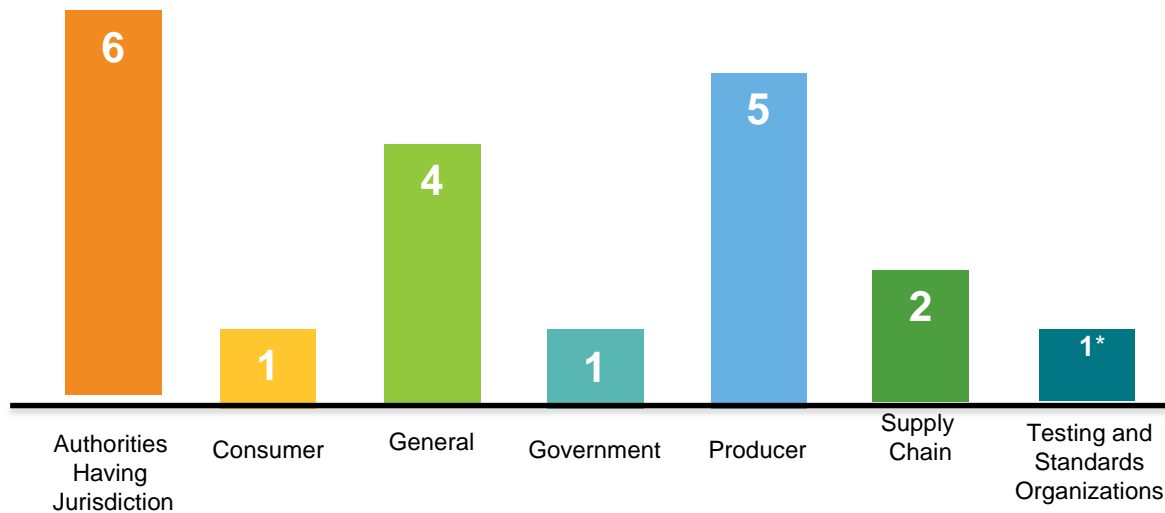
October 2018: ANSI accredited First Edition standard published

January 2019: ANSI and SCC accredited Second Edition standard published



UL 2524 Standards Technical Panel (STP)

NUMBER OF VOTING SEATS HELD – 20 TOTAL



GROUPS REPRESENTED

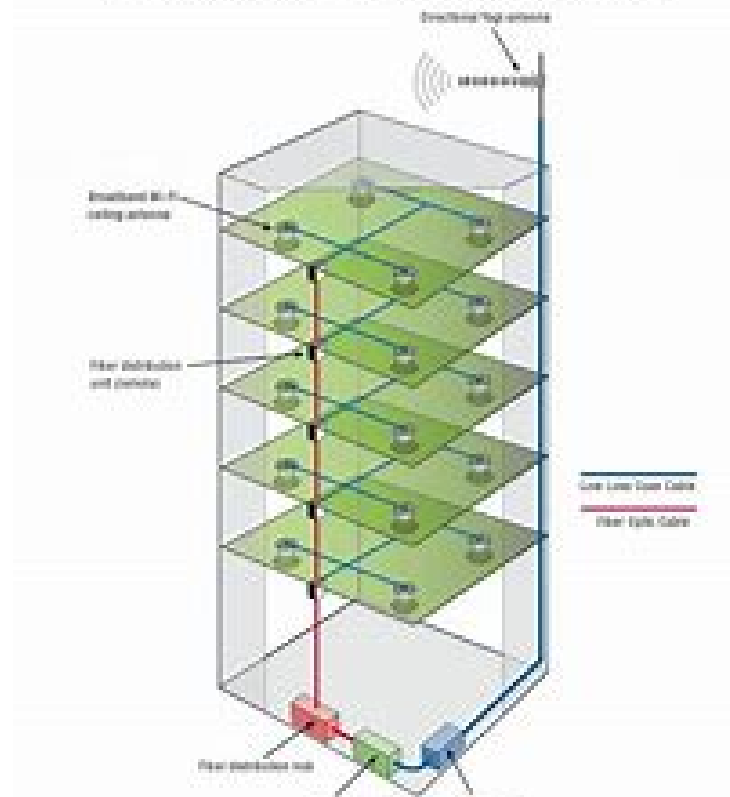
* UL holds the one voting seat in this category



UL 2524

Distributed Antenna System (DAS)

In-Building Distributed Antenna System



UL 2524

This standard addresses the following areas:

- Safety (risk of fire and risk of shock) requirements – construction and testing
- Compliance with specific performance requirements in accordance with the IFC-2018 & NFPA 1221-2019
- Reliability performance requirements applicable for life safety systems – construction and testing
- Product marking and installation documentation



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Construction:

- Type 4 or 4X for all repeater, transmitter, receiver, signal booster components, external filters, and battery system components
 - ❖ *Rechargeable standby batteries are permitted to be contained in enclosures that comply with the requirements for a Type 3R*
- The system shall be sufficiently modular to have the capability to support revised and/or additional system frequencies within the same frequency band of the bi-directional amplifier supplied to maintain radio system coverage as it was originally intended without the need to replace the system.



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Performance - Operation:

- a) Loss of normal AC power *
- b) Battery charger failure *
- c) Loss of battery capacity (to 70 percent depletion) *
- d) Donor antenna disconnection *
- e) Active RF emitting device malfunction *
- f) System component malfunction, other than passive RF components, which affects system performance *
- g) Donor antenna malfunction **

* = Visual and Audible annunciation within 200 sec of fault

** = Visual and Audible annunciation within 24 hrs. of fault



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Reliability:

- a) Variable Voltage Operation Test
- b) Variable Ambient Temperature and Humidity Tests
- c) Component Temperatures Test
- d) Charging Current Test – 12 hours full transmitting load
- e) Supply line and input/output ckt Transient Testing



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Equipment Survivability

- Type 4 and 4X enclosures
- Backbone pathway survivability
- Standby power – 12 hours at 100% capacity

- Does the equipment need to maintain performance to a minimum ambient temperature to extend system operation?
 - Note that equipment includes: repeater, transmitter, receiver, signal booster components, power supply, and battery charging system components



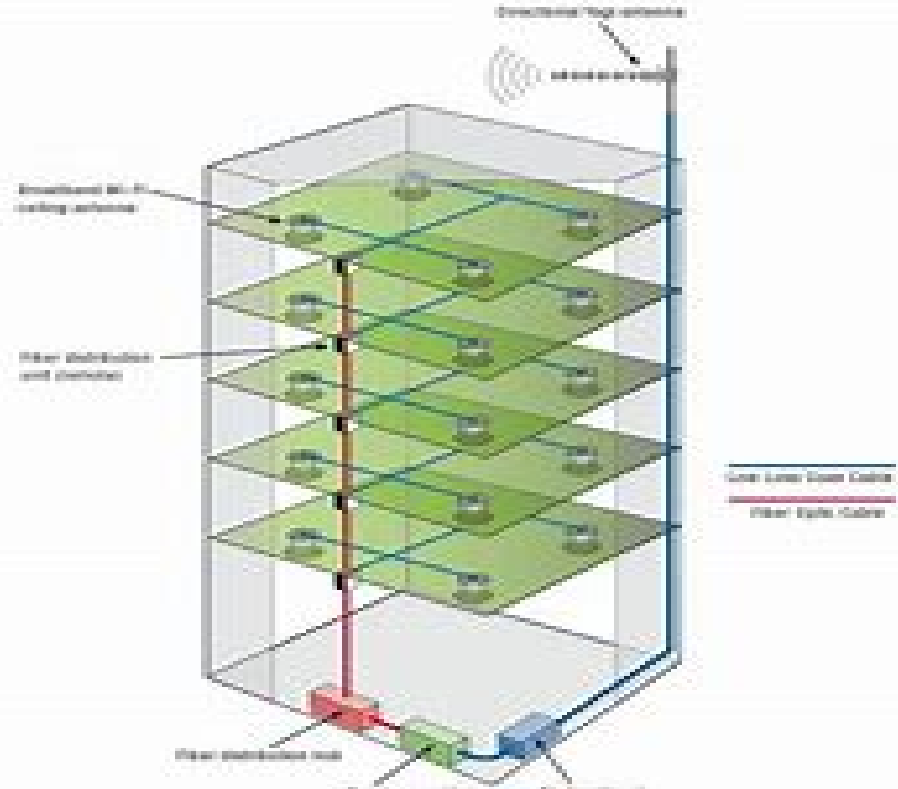
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PASSIVE RF COMPONENT – Any device that RF passes through that does not have an active electronic component that requires external power. This includes antennas, splitters, couplers, coaxial cable and connectors. Passive components cannot amplify RF signals.

ACTIVE RADIO FREQUENCY EMITTING DEVICE – A powered device that emits a radio frequency signal as part of an in-building 2-way emergency radio communication enhancement system

Should passive RF components be monitored for integrity?

In-Building Distributed Antenna System



UL 2524A Outline of Investigation Outline for In-Building Auxiliary Radio Communication Systems

- ARCS for FDNY
- Equipment such as base station, repeaters, transmitters, receivers, signal boosters, power supplies, battery charging system components, and dedicated radio console
- New York City Fire Department Rule 1–RCNY and Rule 3-RCNY 511-01, In-Building Auxiliary Radio Communication Systems.



UL 2524A Outline of Investigation Outline for In-Building Auxiliary Radio Communication Systems

- Unique requirements for FDNY
 - No donor antenna
 - Only manual activation
 - For use with specific channels and radios
 - Passive RF antenna malfunction monitored for integrity



Thank You

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