STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

May 2018

Log No. _____

1. State Building Code to be Amended:

- ☐ International Building Code
- ☐ ICC ANSI A117.1 Accessibility Code
- ☐ International Existing Building Code
- ☐ International Residential Code
- ☒ International Fire Code
- ☐ Uniform Plumbing Code
- ☐ International Mechanical Code
- ☐ International Fuel Gas Code
- ☐ NFPA 54 National Fuel Gas Code
- ☐ NFPA 58 Liquefied Petroleum Gas Code
- ☐ Wildland Urban Interface Code

For the Washington State Energy Code, please see specialized energy code forms

Section(s): WAC 51-54A-0202, WAC 51-54A-0510

Title: General definitions, Emergency responder communication coverage

2. Proponent Name (Specific local government, organization or individual):

Proponent: 2024 International Fire Code Technical Advisory Group

Title: TAG Member

Date: 9/17/2024

3. Designated Contact Person:

Name: Ricky Campbell

Title:

Address:

Office Phone: ( )

Cell: (206) 681-8406

E-Mail address: ricky@ualocal699.org

4. **Proposed Code Amendment**. Reproduce the section to be amended by underlining all added language, striking through all deleted language. Insert new sections in the appropriate place in the code in order to continue the established numbering system of the code. If more than one section is proposed for amendment or more than one page is needed for reproducing the affected section of the code, additional pages may be attached.

   Clearly state if the proposal modifies an existing amendment or if a new amendment is needed. If the proposal modifies an **existing amendment**, show the modifications to the existing amendment by underlining all added language and striking through all deleted language. If a new amendment is needed, show the modifications to the **model code** by underlining all added language and striking through all deleted language.

   Code(s) IFC **Section(s)** 202 and 510

   Enforceable code language must be used.
   Modify **existing amendment** to read as follows:

WAC 51-54A-0202 General definitions.

~~**EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEM (ERCES).** An infrastructure solution installed within a building to enhance the communications capabilities for first responders that utilizes solutions such as a signal booster, voting receiver, base station, or other technology capable of enhancing the radio frequency (RF) to ensure effective public safety communications.~~

~~**FREQUENCY.** The particular waveband at which a communications system broadcasts or transmits.~~

~~**FREQUENCY LICENSE HOLDER(S).** The person(s) or entity(s) that are issued the license from the frequency licensing authority of United States or other country of jurisdiction for the frequencies being used by both the in-building emergency responder communications enhancement system and the emergency services communications system that it enhances.~~

~~**FREQUENCY LICENSING AUTHORITY.** The government authority in a country or territory that issues frequency licenses for the use of communications frequencies by authorized entities and individuals.~~

PUBLIC SAFETY COMMUNICATIONS SYSTEM.
A system that provides communications coverage for use by emergency responders within the jurisdictional area.

WAC 51-54A-0510

Emergency responder communications coverage.

510.1 Emergency responder communication coverage in new buildings. Approved in-building, *emergency responder communications* coverage ~~*enhancement system (ERCES)*~~ for emergency responders shall be provided in all new buildings. In-building emergency responder communications coverage ~~ERCES~~ within the building shall be based on the existing coverage levels of the public safety communication systems utilized by the jurisdiction, measured at the exterior of the building. The *emergency responder communications enhancement system*, where required, shall be of a type determined by the *fire code official* and the frequency license holder(s). This section shall not require improvement of the existing public safety communication systems.

EXCEPTIONS: 1. Where approved by the *building official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained instead of an approved communication coverage system.

2. Where it is determined by the *fire code official* and the *frequency license holder* that the communication coverage system is not needed based on existing in-building signal strength, quality and coverage from the public safety communication system(s) as determined by an approved radio frequency (RF) evaluation.

3. In facilities where emergency responder communication coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the *fire code official* shall have the authority to accept an automatically activated *emergency responder communication coverage system.*

4. One-story buildings not exceeding 12,000 square feet (1115m^2) with no below-ground area(s).

510.1.1 Radio frequency (RF) evaluation. A radio frequency (RF) evaluation shall be performed to determine if existing (RF) coverage by the public safety communications system(s) utilized by the jurisdiction exists within the building to meet the signal coverage, strength and quality requirements of NFPA 1225 prior to requiring the installation and operation of an emergency responder communications enhancement system.

510.2 Emergency responder communication ~~enhancement system~~ coverage in existing buildings. Existing buildings shall be provided with approved in-building, *emergency responder communications ~~enhancement system~~* coverage for emergency responders as required in Chapter 11.

510.3 Permits. Permits for in-building emergency responder communications enhancement systems shall be in accordance with Sections 510.3.1 and 510.3.2.

510.3.1 Permit required. A construction permit for the installation of or modification to in-building, *emergency responder communication enhancement systems* and related equipment is required as specified in Section 105.6.45. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.3.2 Operational permit. Where required by the fire code official, an operational permit shall be issued for the operation of an in-building emergency responder communications enhancement system

510.4 Technical and design requirements. The in-building emergency responder communication enhancement system shall be designed in accordance with this code and NFPA 1225. ~~Equipment required to provide in-building, *emergency responder communication enhancement system* shall be *listed* in accordance with UL 2524. Systems, components and equipment required to provide the in-building, *emergency responder communication enhancement system* shall comply with Sections 510.4.1 through 510.4.2.8.~~

510.4.1 ~~Emergency responder communications enhancement system signal strength~~ Listing. ~~The building shall be considered to have an acceptable in-building emergency responder communications enhancement system where signal strength measurements in 95 percent of all areas and 99 percent of areas designated as critical areas by the fire code official on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.~~ Equipment required to provide in-building emergency responder communications enhancement shall be listed in accordance with UL 2524.

510.4.1.1 RESERVED.

~~510.4.1.3~~ 510.4.2 ~~System performance~~ Signal Strength & Quality.
Signal strength shall be sufficient to meet the requirements of the frequencies, applications and other modulation technologies being utilized by public safety for emergency operations through the coverage area as specified by the *fire code official* in Sections 510.4.2.~~2~~1 and 510.4.2.2.

510.4.~~1~~2.1 Minimum signal strength into the building. The minimum ~~inbound~~ *downlink* signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the *fire code official*. The ~~inbound~~ *downlink* signal level shall be a minimum of -95 dBm in 95 percent of the coverage area and 99 percent in *critical areas* and sufficient to provide not less than a delivered audio quality (DAQ) of 3.0 throughout the coverage area using either narrowband analog, digital or wideband LTE signals or an equivalent bit error rate (BER), or signal-to-interference-plus-noise ratio (SINR) applicable to the technology for either analog or digital signals

510.4.~~1~~2.2 Minimum signal strength out of the building. The minimum uplink signal strength shall be sufficient to provide usable voice communications throughout the coverage area as specified by the fire code official. The uplink signal level shall be sufficient to provide not less than a delivered audio quality (DAQ) of 3.0 using either narrowband analog, digital or wideband LTE digital signals or an equivalent bit error rate (BER), or an equivalent SINR applicable to the technology for either analog or digital signals.

~~**510.4.2 System design.** The in-building emergency responder communications enhancement system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.8 and NFPA 1221.~~

~~**510.4.2.1 Amplification systems and components.** Buildings and structures that cannot support the required level of in-building, *emergency responder communication enhancement system* shall be equipped with systems and components to enhance the radio signals and achieve the required level of in-building, *emergency responder communication enhancement system* specified in Sections 510.4.1 through 510.4.1.3. In-building, *emergency responder communication enhancement systems* utilizing radio-frequency-emitting devices and cabling shall be approved by the *fire code official*. Prior to installation, all RF-emitting devices shall have the certification of the radio licensing authority and be suitable for public safety use.~~

~~**510.4.2.2 Technical criteria.** The fire code official shall maintain a document providing the specific technical information and requirements for the in-building, *emergency responder communication enhancement system*. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, the effective radiated power of radio sites, the maximum propagation delay in microseconds, the applications being used and other supporting technical information necessary for system design.~~

~~**510.4.2.3 Standby power.** In-building emergency responder communications enhancement systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the in-building emergency responder communications enhancement system at 100-percent system capacity for a duration of not less than 12 hours.~~

510.4.~~2.4~~3 Signal booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a National Electrical Manufacturer's Association NEMA Type 4 cabinet, IP66-type waterproof cabinet or equivalent.

EXCEPTION: Listed battery systems that are contained in integrated battery cabinets.

2. Battery systems used for the emergency power source shall be contained in a NEMA 3R or higher-rated cabinet, IP65-type waterproof cabinet or equivalent.

EXCEPTION: Listed battery systems that are contained in integrated battery cabinets.

3. Equipment shall have FCC or other radio licensing authority certification and be suitable for public safety use prior to installation.

4. Where a donor antenna exists, isolation shall be maintained between the donor antenna and all inside antennas to not less than 20dB greater than the system gain under all operating conditions.

5. Bi-directional amplifiers (BDA) used for in-building, *emergency responder communication enhancement systems* shall be fitted with anti-oscillation detection and control circuitry and per-channel AGC. Active RF-emitting devices used for in-building emergency responder communications enhancement systems shall have built-in oscillation detection and control circuitry to reduce gain and maintain operation. When a signal booster detects oscillation, a supervisory signal shall be transmitted. In the event of uncorrectable oscillation, the system shall be permitted to shut down.

6. The installation of amplification systems or systems that operate on or provide the means to cause interference on any in-building emergency responder communications enhancement system network shall be coordinated and approved by the fire code official and the frequency license holder(s).

7. Only channelized signal boosters shall be permitted.

EXCEPTION: Broadband BDAs may be utilized when specifically authorized in writing by the *frequency license holder*.

510.4.~~2.5~~4 System monitoring. The in-building, *emergency responder communication enhancement system* shall include automatic supervisory and trouble signals that are monitored by a supervisory service and are annunciated by the *fire alarm system* in accordance with NFPA 72. The following conditions shall be separately annunciated by the *fire alarm system*, or, if the status of each of the following conditions is individually displayed on a dedicated panel on the in-building, *emergency responder communication enhancement system*, a single automatic supervisory signal may be annunciated on the *fire alarm system* indicating deficiencies of the in-building, *emergency responder communication enhancement system*:

1. Loss of normal AC power supply.
2. System battery charger(s) failure.
3. Signal source malfunction.
4. Failure of active RF-emitting device(s).
5. Low-battery capacity at 70 percent of the 12-hour operating capacity has been depleted. ~~reduction of operating capacity.~~
6. Failure of critical system components.
7. Malfunction of the communications link between the *fire alarm system* and the in-building, *emergency responder communication enhancement system*.
8. Oscillation of active RF-emitting device(s).
9. Malfunction of the donor antenna(s).
10. Active system component malfunction.

510.4.2.8 RESERVED. ~~**Radio communication antenna density.** Systems shall be engineered to minimize the near-far effect. In-building, *emergency responder communication enhancement system* designs shall include sufficient antenna density to address reduced gain conditions.~~

~~**EXCEPTION:** Systems where all portable devices within the same band use active power control features.~~

~~**510.4.2.5.1**~~ **510.4.5 Single supervisory input.**
Where approved, a single supervisory input to the fire alarm system to monitor all system supervisory signals shall be permitted.

~~**510.4.2.6**~~ **510.4.6 Additional frequencies and change of frequencies.** The in-building, *emergency responder communication enhancement system* shall be capable of modification or expansion in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority.

~~**510.4.2.7**~~ **510.4.7 Design documents.** The *fire code official* shall have the authority to require "as-built" design documents and specifications for in-building, *emergency responder communication enhancement systems*. The documents shall be in a format acceptable to the *fire code official*.

~~**510.4.2.9**~~ **510.4.8 Noise interference.** Where a signal booster is used, signal booster type(s) and the uplink signal and noise levels shall be coordinated with and approved by all frequency license holder(s) that may be adversely impacted by any transmitted noise resulting from the in-building emergency responder communications enhancement system. Systems shall be in compliance with all frequency licensing authority requirements.

510.5 Installation requirements. The installation of the in-building, *emergency responder communication enhancement system* shall be in accordance with NFPA ~~1221~~1225 and Sections 510.5.1 through 510.5.~~7~~6.

510.5.1 Mounting of the donor antenna(s). To maintain proper alignment with the system designed donor site, donor antennas shall be permanently affixed on the highest possible position on the building or where *approved* by the *fire code official*. A clearly visible sign stating "MOVEMENT OR REPOSITIONING OF THIS ANTENNA IS PROHIBITED WITHOUT APPROVAL FROM THE FIRE CODE OFFICIAL." shall be posted. The antenna installation shall be in accordance with the applicable requirements in the *International Building Code* for weather protection of the building envelope.

510.5.2 Approval prior to installation. Communications enhancement systems capable of operating on frequencies licensed to any public safety agency by the FCC or other frequency licensing authority shall not be installed without prior coordination and approval of the fire code official and frequency license holder.

510.5.3 Minimum qualifications of personnel. The minimum qualifications for technical competency of the system designer, lead installation, maintenance and lead acceptance test personnel shall include ~~both of~~ the following:
~~1. A valid FCC-issued general radio telephone operators license.~~
~~2~~1. Certification of in-building system training issued by an *approved* organization ~~or *approved* school, or a~~
2. A certificate issued by the manufacturer of the equipment being installed.

510.5.4 Acceptance test procedure. Where an in-building *emergency responder communication enhancement system* is required, and upon completion of installation, the building *owner* shall have the ~~radio~~ system tested to verify that two-way coverage on each floor of the building is in accordance with Section 510.4.~~1~~2.1 and 510.4.2.2. The test procedure shall be conducted as follows:
1. Each floor of the building shall be divided into a grid of 20 approximately equal test areas, with a maximum test area size of 6,400 square feet (595 m2). Where the floor area exceeds 128,000 square feet (11,904 m2), the floor shall be divided into as many approximately equal test areas as needed, such that no test area exceeds the maximum square footage allowed for a test area.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system or equipment approved by the *fire code official*.
3. Coverage testing of signal strength shall be conducted using a calibrated spectrum analyzer for each of the test grids. A diagram of this testing shall be created for each floor where coverage is provided, indicating the testing grid used for the test in Section 510.5.4(1), and including signal strengths and frequencies for each test area. Indicate all critical areas.
4. Functional talk-back testing shall be conducted using two calibrated portable radios of the latest brand and model
used by the agency's radio communications system or other equipment approved by the *fire code official.* Testing shall use digital audible quality (DAQ) metrics, where a passing result is a DAQ of 3 or higher. Communications between handsets shall be tested and recorded in the grid square diagram required by Section 510.5.~~3~~4(~~2~~1); each grid square on each floor; between each critical area and a radio outside the building; between each critical area and the fire command center or fire alarm control panel; between each landing in each stairwell and the fire command center or fire alarm panel.
5. Failure of more than 5 percent of the test areas on any floor shall result in failure of the test.
EXCEPTION: Critical areas shall be provided with 99 percent floor area coverage.
6. In the event that two of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of not more than two nonadjacent test areas shall not result in failure of the test. If the system fails the 40 area test, the system shall be altered to meet the 95 percent coverage requirement.
7. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered to be a failure of that test area. Additional test locations shall not be permitted.
8. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building *owner* so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building *owner* shall be required to rerun the acceptance test to reestablish the gain values.
9. As part of the installation, a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and at subsequent annual inspections.
10. Systems shall be tested using two portable radios simultaneously conducting subjective voice quality checks. One portable radio shall be positioned not greater than 10 feet (3048 mm) from the indoor antenna. The second portable radio shall be positioned at a distance that represents the farthest distance from any indoor antenna. With both portable radios simultaneously keyed up on different frequencies within the same band, subjective audio testing shall be conducted and comply with DAQ levels as specified in Sections 510.4.~~1~~2.1 and 510.4.~~1~~2.2.
11. Documentation maintained on premises. At the conclusion of the testing, and prior to issuance of the building certificate of occupancy, the building owner or owner's representative shall place a copy of the following records in the Distributed Antenna System enclosure or the building engineer's office. The records shall be available to the fire code official and maintained by the building owner for the life of the system:
a. A certification letter stating that the *emergency responder enhancement coverage system* has been installed and tested in accordance with this code, and that the system is complete and fully functional.
b. The grid square diagram created as part of testing in Sections 510.5.~~3~~4(2) and 510.5.~~3~~4(3).
c. Data sheets and/or manufacturer specifications for the *emergency responder enhancement coverage system* equipment; back up battery; and charging system (if utilized).
d. A diagram showing device locations and wiring schematic.
e. A copy of the electrical permit.

510.5.5 ~~FCC compliance.~~ ~~The in-building, *emergency responder communication enhancement system* installation and components shall comply with all applicable federal regulations including, but not limited to, FCC 47 C.F.R. Part 90.219.~~

510.5.6~~5~~ Wiring. Wiring shall be installed per NFPA 1225. ~~The backbone, antenna distribution, radiating, or any fiber optic cables shall be rated as plenum cables. The backbone cables shall be connected to the antenna distribution, radiating, or copper cables using hybrid coupler devices of a value determined by the overall design. Backbone cables shall be routed through an enclosure that matches the building's required fire-resistance rating for shafts or interior exit stairways. The connection between the backbone cable and the antenna cables shall be made within an enclosure that matches the building's fire-resistance rating for shafts or interior exit stairways, and passage of the antenna distribution cable in and out of the enclosure shall be protected as a penetration per the *International Building Code*.~~

510.5.~~7~~6 Identification signs. *Emergency responder enhancement systems* shall be identified by an approved sign located on or near the fire alarm control panel or other approved location stating "This building is equipped with an *Emergency Responder Enhancement Coverage System*. Control Equipment located in ..... or as approved by the *Fire Code Official*." A sign stating "*Emergency Responder Enhancement Coverage System Equipment*" shall be placed on or adjacent to the door of the room containing the main system components.

510.6 Maintenance. The in-building, *emergency responder communication enhancement system* shall be maintained operational at all times in accordance with ~~Sections 510.6.1 through 510.6.4~~this code and NFPA 1225.

510.6.1 System Testing and proof of compliance. The *owner* of the building or *owner's* authorized agent shall have the in-building, *emergency responder communication enhancement system* inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following items 1 through 7:
1. In-building coverage test as required by the *fire code official* as described in Section 510.5.4 or 510.6.1.1.
EXCEPTION: Group R Occupancy annual testing is not required within *dwelling units*.
2. Signal boosters shall be tested to verify that the gain/output level is the same as it was upon initial installation and acceptance or set to optimize the performance of the system.
3. Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturers specification.
5. If a fire alarm system is present in the building, a test shall be conducted to verify that the fire alarm system is properly supervising the *emergency responder communication enhancement system* as required in Section 510.4.2.~~5~~4. The test is performed by simulating alarms to the fire alarm control panel. The certifications in Section 510.5.~~2~~3 are sufficient for the personnel performing this testing.
6. At the conclusion of testing, a record of the inspection and maintenance along with an updated grid diagram of each floor showing tested strengths in each grid square and each critical area shall be added to the documentation maintained on the premises in accordance with Section 510.5.~~3~~4.
7. At the conclusion of the testing, a report, which shall verify compliance with Section 510.6.1, shall be submitted to the *fire code official*.

510.6.1.1 Alternative in-building coverage test. When the comprehensive test documentation required by Section 510.5.~~3~~4 is available, or the most recent full five-year test results are available if the system is older than six years, the in-building coverage test required by the fire code official in Section 510.6.1(1), may be conducted as follows:
1. Functional talk-back testing shall be conducted using two calibrated portable radios of the latest brand and model used by the agency's radio communications system or other equipment approved by the fire code official.

Testing shall use digital audible quality (DAQ) metrics, where a passing result is a DAQ of 3 or higher. Communications between handsets in the following locations shall be tested: Between the fire command center or fire alarm control panel and a location outside the building and between the fire alarm control panel and each landing in each stairwell.
2. Coverage testing of signal strength shall be conducted using a calibrated spectrum analyzer for:
a. Three grid areas per floor. The three grid areas to be tested on each floor are the three grid areas with poorest performance in the acceptance test or the most recent annual test, whichever is more recent;
b. Each of the critical areas identified in acceptance test documentation required by Section 510.5.~~3~~4, or as modified by the fire code official; and
c. One grid square per serving antenna.
3. The test area boundaries shall not deviate from the areas established at the time of the acceptance test, or as modified by the *fire code official*. The building shall be considered to have acceptable emergency responder communication coverage when the required signal strength requirements in Sections 510.4.~~1~~2.1 and 510.4.~~1~~2.2 are located in 95 percent of all areas on each floor of the building and 99 percent in critical areas, and any nonfunctional serving antenna are repaired to function within normal ranges. If the documentation of the acceptance test or most recent previous annual test results are not available or acceptable to the fire code official, the radio coverage verification testing described in Section 510.5.~~3~~4 shall be conducted.

510.6.2 RESERVED. ~~**Additional frequencies.** The building *owner* shall modify or expand the in-building, *emergency responder communication enhancement system* at their expense in the event frequency changes are required by the FCC or other radio licensing authority, or additional frequencies are made available by the FCC or other radio licensing authority. Prior approval of an in-building, *emergency responder communication enhancement system* on previous frequencies does not exempt this section.~~

510.6.3 ~~**Nonpublic safety system.** Where other nonpublic safety amplification systems installed in buildings reduce the performance or cause interference with the in-building, *emergency responder communication enhancement system*, the nonpublic safety amplification system shall be corrected or removed.~~

~~**510.6.4**~~ **510.6.3 Field testing.** *Agency* personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage or to disable a system adversely impacting the *emergency responder communication enhancement system* in the region.

5. Briefly explain your proposed amendment, including the purpose, benefits and problems addressed. Specifically note any impacts or benefits to business, and specify construction types, industries and services that would be affected. Finally, please note any potential impact on enforcement such as special reporting requirements or additional inspections required.

The existing WAC provisions in 202 & 510 were based on the 2024 IFC and local conditions. This proposal deletes some existing WAC amendments because the language now matches model code or is in NFPA 1225 and renumbers existing sections. The other existing WAC amendments are maintained for consistency.

Section 510.1 was modified in 2027 IFC code change proposals F76-24 and F78-24 along with the addition of 510.1.1 and the definition of Public Safety Communications Systems. WA State has tried to stay on the cutting edge of code changes for these systems and we are proposing to bring the 2027 IFC language into our 2024 WA State Fire Code. Additional reasoning is summarized by the proponent of the national code changes as follows:
"During the 2024 code development cycle the term two-way radio communications coverage system was changed to align with standard industry terminology identify systems that enhance radio frequency (RF) coverage inside buildings as Emergency Responder Communications Enhancement Systems in F32-21. As a result of this global change taking place within Section 510 it inadvertently modified the scope of the

section's title and section 510.1 by eliminating the word "coverage" in certain locations. This proposed language for the section title and section 510.1 reinserts the word "coverage" where it is needed to clarify the intent of the issue of when and if an enhancement system is required. It is important to identify and understand that there is RF coverage naturally from the public safety communications system in many buildings as well as buildings where the RF signal is blocked. It is imperative that in-building RF solutions only be installed where they are actually needed. This is a requirement from many frequency licensing authorities due to potential noise and interference to the public safety communications system.
The proposed language within exception #2 is intended to clarify the baseline requirements to be utilized to determine if an emergency responder enhancement system is actually needed or not.
The proposed language within 510.1.1 is intended to address a significant need that has been overlooked during previous code development cycles. As currently written, both the IFC and NFPA ERCES related codes and standards only address the installation of an Emergency Responder Communications Enhancement System (ERCES) and do not provide the necessary direction and requirements to determine if a system is actually needed through a radio frequency (RF) evaluation.
An essential part of determining the need for an emergency responder communications enhancement system (ERCES) is the initial in-building coverage evaluation often referred to as a (RF) survey. The purpose of conducting an initial evaluation is to determine if (RF) from the public safety communication system(s)s utilized by the jurisdiction(s) can penetrate the building to provide sufficient signal strength and quality in addition to the coverage requirements for both general and critical areas without the need for an emergency responder communications enhancement system.
Earlier editions of the standard for ERCES focused on the testing of signal strength only using a measurement of -95DBm. Based on experience, lessons learned and the need for signal quality in addition to signal strength, the testing requirements have evolved. During the evaluation process, it is imperative that signal coverage, strength and signal quality be evaluated for both uplink and downlink communications capabilities. This will include but is not limited to measurements such as delivered audio quality (DAQ), bit error rate
(BER) and signal to interference noise ratio (SINR) which provide the quality measurement of the signal.
In many areas, the frequency licensing authority (the Federal Communications Commission in the United States) requires that signal boosters be used in weak signal areas only. In other words, you shall not install and operate an ERCES where it is not actually needed. Therefore, the initial evaluation should be utilized to determine if a building has sufficient signal naturally may need complete or partial enhancement where (RF) is not sufficient to meet the required levels.
It is vital to understand that if there is an insufficient signal level from the public safety communications system outside the building, there is no requirement to install an ERCES within the building. Additionally, there may be multiple public safety communications systems in use by the jurisdiction. To ensure coverage for all emergency responders such as fire, law enforcement, EMS and others, all systems in use by emergency responders should be properly evaluated to ensure adequate signal coverage, strength and quality exist.
Requiring unnecessary ERCES installations will contribute to noise and interference that can impact the health of the entire public safety communications system to the point where it can completely fail leaving emergency responders with no communications within their jurisdiction not just inside the building."

6. **Specify what criteria this proposal meets.** You may select more than one.
   - ☐ The amendment is needed to address a critical life/safety need.
   - ☒ The amendment clarifies the intent or application of the code.
   - ☒ The amendment is needed to address a specific state policy or statute.
   - ☐ The amendment is needed for consistency with state or federal regulations.
   - ☐ The amendment is needed to address a unique character of the state.
   - ☐ The amendment corrects errors and omissions.

7. **Is there an economic impact:** ☐ Yes ☒ No

If no, state reason: The code change proposal will not increase or decrease the cost of construction as it is a code correlation with NFPA 1225.

If yes, provide economic impact, costs and benefits as noted below in items a – f.

a. ***Life Cycle Cost.*** Use the OFM Life Cycle Cost **Analysis tool** to estimate the life cycle cost of the proposal using one or more typical examples. Reference these **Instructions;** use these **Inputs.** Webinars on the tool can be found **Here** and **Here**). If the tool is used, submit a copy of the excel file with your proposal submission. If preferred, you may submit an alternate life cycle cost analysis.

b. ***Construction Cost.*** Provide your best estimate of the construction cost (or cost savings) of your code change proposal.

   $Click here to enter text./square foot

   (For residential projects, also provide $Click here to enter text./ dwelling unit)

   Show calculations here, and list sources for costs/savings, or attach backup data pages

c. ***Code Enforcement.*** List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

d. ***Small Business Impact.*** Describe economic impacts to small businesses:

e. ***Housing Affordability.*** Describe economic impacts on housing affordability:

f. ***Other.*** Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Please send your completed proposal to: sbcc@des.wa.gov

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.