

## APPENDIX J

# EMERGENCY RESPONDER RADIO COVERAGE

*The provisions contained in this appendix are adopted by the State or Oregon.*

### SECTION J101 GENERAL

**J101.1 Scope.** Systems, components and equipment required to provide emergency responder radio coverage shall be in accordance with this appendix.

**J101.2 Permit.** A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

### SECTION J102 DEFINITIONS

**J102.1 Definitions.** For the purpose of this appendix, certain terms are defined as follows:

**AGENCY.** Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement.

### SECTION J103 TECHNICAL REQUIREMENTS

**J103.1 System design.** The emergency responder radio coverage system shall be designed in accordance with Sections J103.1.1 through J103.1.5.

**J103.1.1 Amplification systems allowed.** Buildings and structures that cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.

**J103.1.2 Technical criteria.** The *fire code official* shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage 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 and other supporting technical information.

**J103.1.3 Secondary power.** The emergency responder radio coverage system shall be equipped with a secondary source of power. The secondary source of power shall be either a battery system or an emergency generator. The secondary power supply shall supply power automatically when the primary power source is lost. The secondary source of power shall be capable of operating the emergency

responder radio coverage system for a period of at least 12 hours.

**J103.1.3.1 Battery systems.** The active components of the installed system or systems shall be capable of operating on an independent battery system for a period of at least 12 hours without external power input. The battery system shall automatically charge in the presence of external power input.

**J103.1.4 Signal booster requirements.** If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type waterproof cabinet.
2. The battery system shall be contained in a NEMA4-type waterproof cabinet.
3. The system shall include automatic alarming of malfunctions of the signal booster and battery system. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72 or, when approved by the *fire code official*, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC certification prior to installation.

**J103.1.5 Additional frequencies and change of frequencies.** The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.

**J103.2 Installation requirements.** The installation of the public safety radio coverage system shall be in accordance with Sections J103.2.1 through J103.2.5.

**J103.2.1 Approval prior to installation.** No amplification system capable of operating on frequencies licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the *fire code official*.

**J103.2.2 Permit required.** A construction permit, as required by Section 105.7.5 of the *International Fire Code*, shall be obtained prior to the installation of the emergency responder radio coverage system.

**J103.2.3 Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead installation personnel shall include:

1. A valid FCC-issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization or school or a

certificate issued by the manufacturer of the equipment being installed.

The agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

**J103.2.4 Acceptance test procedure.** When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
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.
3. A maximum of two nonadjacent areas shall be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas shall be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90-percent coverage requirement.
5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be 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 area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
6. 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.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at time of installation and subsequent annual inspections.

**J103.2.5 FCC compliance.** The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations, including but not limited to, FCC 47 CFR 90.219.

**J103.3 Maintenance.** The emergency responder radio coverage system shall be maintained in accordance with Sections J103.3.1 through J103.3.5.

**J103.3.1 Maintenance.** The public radio coverage system shall be maintained operational at all times.

**J103.3.2 Permit required.** A construction permit, as required by Section 105.7.5 of the *International Fire Code*, shall be obtained prior to the modification or alteration of the emergency responder radio coverage system.

**J103.3.3 Testing and proof of compliance.** The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section J103.2.4.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load for a period of one hour to verify that they will properly operate during an actual power outage. If within the one-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one-hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer’s specifications.
5. At the conclusion of the testing a report which shall verify compliance with Section J103.3.4 shall be submitted to the *fire code official*.

**J103.3.4 Additional frequencies.** The building *owner* shall modify or expand the emergency responder radio coverage system at his or her expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

**J103.3.5 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.

**SECTION J104  
REFERENCED STANDARDS**

FCC 47 CFR 90.219—2007	Private Land Mobile Radio Services—Use of Signal Boosters	J103.2.5
ICC IFC—09	International Fire Code	J103.2.2, J103.3.2
NFPA 72—07	National Fire Alarm Code	J103.1.4