

Administrative Rule 9.04.07

SUBJECT: EMERGENCY RADIO COMMUNICATION ENHANCEMENTS	EFFECTIVE DATE: October 21, 2007
REFERENCES: 2006 SFC Section 907 2006 SBC Section 907	SUPERSEDES: Emergency Radio Communication Enhancements, Aug, 2004
	FCAB REVIEW DATE: May 15, 2007
NOTICE: Administrative Rules are established per 2006 Seattle Fire Code Section 104.1, and they are subject to the Administrative Sections 104.9 Alternate Materials and Methods, Section 104.8 Modifications, and Section 108.1 Appeals.	APPROVED: _____ KENNETH TIPLER, FIRE MARSHAL

SCOPE:

This Administrative Rule provides criteria for when a fire department radio system is used as an alternative to an approved two-way, fire department communication system designed and installed in accordance with NFPA 72 in high-rise buildings and other complex structures in accordance with 907.2.12.3 of the 2006 Seattle Fire Code.

DEFINITIONS:

King County Regional 800 MHz Radio System - An 800 MHz trunked radio system, including compatible mobile and portable radios, base stations, a microwave transmission network, network controllers and other related equipment.

REQUIREMENTS:

For purposes of this rule, adequate radio coverage shall include all of the following:

- 1) A minimum signal strength of three (3) microvolts available in 95% of all areas of the building when transmitted from the King County Regional 800 MHz Radio System;
- 2) A minimum signal strength of one-half (.5) microvolts received by the King County Regional 800 MHz Radio System when transmitted from 95% of all areas of the building; and
- 3) The frequency range that must be supported shall be 806 MHz to 824 MHz and 851 MHz to 869 MHz in all areas of the building.

Buildings and structures that cannot support the required level of radio coverage as listed above shall be equipped with either or both of the following in order to achieve the required adequate radio coverage:

- 1) A radiating cable system;
- 2) An internal multiple antenna system with FCC type accepted bi-directional 800 MHz amplifiers.

If any part of the installed system or systems contains an electrically powered component, the installed system or systems shall be capable of operating on an independent battery system for a period of a least twelve (12) hours without external power input. The battery system shall automatically charge in the presence of external power input.

No amplification system capable of operating on frequencies assigned to the King County Regional 800 MHz Radio System shall be installed without prior coordination and approval of the King County Regional Communications Board.

In the event that a signal booster is employed, it shall be fully encased within a NEMA 4 (or equivalent) dust/waterproof case, and filters that reject adjacent cellular frequencies shall be included in addition to the multi-bandpass filters.

Power Supply

Power supplies shall conform with NFPA 72 Power Supplies 1-5.2

Continuing Operation/ Supervision

The occurrence of any fault in this radio system where the system function is decreased will result in the transmission of a supervisory signal to the central station. If the system cannot be fully restored within one hour, the Fire Chief will be notified.

Acceptance Tests

Acceptance testing for an in-building radio amplification system is required, upon completion of installation. It is the building owner's responsibility to have the radio system tested by qualified personnel to ensure a minimum of 95% two-way coverage on each floor of the building. The performance test shall include at minimum a floor plan and the signal strength in various locations of the building. Each owner shall submit a new field performance test report, whenever structural changes occur to the building that would materially change the original field performance tests.

Note: A Certificate of Occupancy will not be issued to any structure if the building fails to comply with this section.

Talk-back testing from a site to the King County Regional 800 MHz Radio System shall use a two (2) watt, portable transceiver with speaker/microphone and flexible antenna. Field strength testing instruments must have been calibrated within one (1) year) of the date of the acceptance test. Field strength testing instruments must be of the frequency selective type incorporating a flexible antenna similar to the ones used on the hand held transceivers. The City of Seattle's Radio System Manager may designate alternate methods of measuring the signal level, which satisfy appropriate levels of public safety grade coverage. A representative of the Seattle Fire Department will oversee the acceptance test.

Each floor of the building shall be divided into a grid of approximately forty (40) equal areas. A maximum of two (2) nonadjacent areas will be allowed to fail the test. In the event that three (3) of the areas fail the test, the floor may be divided into eighty (80) equal areas in order to be more statistically accurate. In such event, a maximum of four (4) nonadjacent areas will be allowed to fail the test. After the eighty (80) area tests, if the system continues to fail, the building owner shall have the system altered to meet the 95% coverage requirement.

A spot located approximately in the center of a grid area will be selected for the test, then the radio will be keyed to verify two-way communication to and from the outside of the building through the King County Regional 800 MHz Radio System. Once the spot has been selected, prospecting for a better spot within the grid area will not be permitted.

The gain values of all amplifiers shall be measured and the results kept on file with the building owner so that the measurements can be verified each year during the annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.

Annual Tests

When an in-building radio system is installed in lieu of a firefighter phone system, it shall be the building owner's responsibility to have all active components of the system, such as amplifiers, power supplies and backup batteries tested a minimum of once every twelve (12) months. Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If, within the one-hour test period, and in the opinion of the testing technician, 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. All other active components shall be checked to determine that they are operating within the manufacturers specifications for the intended purpose.

Five-year tests

In addition to the annual test, it shall be the building owner's responsibility to perform a radio coverage test a minimum of once every five (5) years to ensure that the radio system continues to meet the requirements of the original acceptance test.

Qualifications of testing personnel

Personnel conducting radio system tests shall be qualified to perform the work. All tests shall be documented and signed by a person in possession of a current FCC General Radiotelephone Operator license, or a current technician certification issued by the Associated Public-Safety Communications Officials International (APCO) or the National Association of Business and Education Radio (NABER).

Proof of Compliance

Each owner shall submit on an annual basis proof that the required adequate radio coverage level is available in all required areas of the building and that the installed amplification system functions properly. The annual submittal shall insure that no structural changes have occurred to the building that would materially change the original field tests.

The building owner shall retain all test records on the inspected premises and submit a copy to the Fire Department officials. All persons subject to this section shall submit proof of compliance in writing to the Chief of Police and to the Fire Chief prior to the issuance of the Certificate of Occupancy, if applicable, or by January 30th of each year.