



## **Steps to Success for ERRC Compliance**

- 1) Contact Radio for ERRC Request for Authorization.
- 2) Apply for permit from FPB
- 3) After approval from FPB, install the system.
- 4) Pre-test
- 5) Provide pre-test results to [ERRC\\_Program@piercecountywa.gov](mailto:ERRC_Program@piercecountywa.gov)
- 6) Schedule FPB inspection

### PURPOSE:

To establish requirements for verifying adequate emergency responder radio coverage in newly constructed buildings, and to identify permitting, installation, testing and approval requirements for an in-building Emergency Responder Radio Coverage System (ERRCS) where radio coverage is found to be deficient.

### SCOPE:

This document applies to all projects requiring emergency responder radio coverage in accordance with PCC 17C.60.195.

### REQUIREMENTS:

Proof of adequate coverage required for occupancy. Prior to issuing a Certificate of Occupancy all buildings shall provide proof of adequate emergency responder radio coverage within buildings and spaces. Proof of adequate coverage shall consist of testing the building in accordance with the provisions of IFC 510.5.3 and presenting test documents to the fire marshal for approval.

The Certificate of Occupancy may be approved with a field test demonstration of adequate radio system audibility as demonstrated by clear and audible two-way communication between portable radios within the building. Failure of the field test will require testing in accordance with IFC 510.5.3 and presentation of successful test documents.

Where testing in accordance with 510.5.3 or this document indicates inadequate radio signal coverage an ERRCS shall be installed through the building in accordance with this document and IFC Section 510.



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Fire Marshal

Permitting. A permit is required to install or modify an ERRCS. In addition to the requirements of IFC 105.2. ERRCS applications shall include the following:

1. A site plan identifying the location of the building(s) on the property.
2. A detailed plan of each floor level identifying the spaces with a schematic diagram overlay showing the location of all equipment to be installed and or modified.
3. Listing information and cut sheets for all equipment.
4. Proof that each person designing, installing or testing the ERRCS meets the requirements of IFC 510.2.2.
5. Completed ERRC Request for Authorization
6. Attestation and Supporting Documents

System Design. The PSRCS shall be extended throughout the building such that the systems meet the design criterion of this policy, IFC 510.4.2. ,510.5.4, National Telecommunications and Information Administration (NTIA) Report 99-3358 requirements for Delivered Audio Quality (DAQ) of 3.4 (Speech understandable without repetition. Some noise or distortion present.”).

### Exception

99% ERRCS area coverage at not less than – 95 dBm and DAQ of 3.4 is required in all fire command centers, fire pump and or controller rooms, exit stairs, exit passageways elevator lobbies, standpipe cabinets, interior sprinkler valve or sprinkler and alarm control rooms and other areas identified by the fire marshal as Critical Communication Areas.

### Radio Requirements

ERRCS's intended to re-broadcast the Pierce County 700MHz P25 system frequencies, shall be designed and installed, by qualified Federal Communications Commission (FCC) Licensed personnel.

In addition to the permit, applicants will also be required to complete the ERRC Request for Authorization form. This form is required by the FCC and gives authorization from the licensee, Pierce County, to the DAS Property owner, permission to re-broadcast radio frequencies licensed to Pierce County.

ERRCS devices must be Class A rated signal booster/amplifier. Please note that Class B devices will not be approved by Pierce County.



Since the Pierce County 700 MHz P25 system has many sites and sub-systems that serve and are designed for primary use by local and regional public safety agencies, frequency information and tower coordinates will be provided for projects on a case-by-case basis. This will be contingent upon what first response agency(s) is proximal to the address of the DAS/BDA property. In some cases, the first responders may be a combination of Pierce County 700 MHz users and City of Puyallup 800 MHz users. In this scenario, the ERRCS must provide in-building coverage for both bands.

Prior to commissioning of ERRCS, an uplink test must be performed. The Pierce County Radio Communications Division has loaner radios that may be requested for use to conduct this test. The uplink signal to the donor site, must be no greater than -75 dBm, as measured by Pierce County Radio Communications Division technical staff. This uplink test must be performed prior to the DAQ coverage test for occupancy.

As outlined in the ERRC Request for Authorization form, Pierce County reserves the right to have any ERRCS devices shut off if it is suspected of causing harmful interference to the 700 MHz P25 system until repairs are made and proper operation of the device is demonstrated and approved by Pierce County.

For inquiries or to request the use of loaner radios for uplink testing, please email the following address: [ERRC\\_Program@piercecountywa.gov](mailto:ERRC_Program@piercecountywa.gov)

Power Sources. The primary power for ERRCS shall be by a dedicated circuit. Standby power in case of failure of the dedicated circuit shall be in accordance with IFC 510.4.2.3.

System Monitoring. The ERRCS shall include automatic supervisory in trouble for malfunctions of the signal booster, and power supplies that are enunciated by the fire alarm system and UL listed supervising station monitoring company or monitored at a constantly attended location at the building.

1. System and signal booster supervisory signals shall include the following:
  - a. Donor antenna malfunction.
  - b. Signal booster failure.
  - c. Active RF emitting device malfunction.
  - d. Low battery indication when 70% of the 24 hour operation capacity has been depleted.
  - e. Low fuel level indication when 70% of the backup generator fuel capacity has been deleted (when applicable).
2. Power supply signals shall include the following for each signal booster:



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- a. Loss of AC power.
- b. Failure of battery charger.

**Dedicated Panel.** A dedicated monitoring panel shall be provided in the fire command center or other location as approved by the fire marshal. The monitoring panel shall provide visual and labeled identification of the following:

1. Donor Antenna Trouble.
2. Signal Booster Failure (for each booster).
3. RF Device Malfunction.
4. Low Battery.
5. Low Generator Fuel (when applicable).
6. AC Power Loss.
7. Battery Charger Failure.

**ERRCS Testing.** Acceptance and Operational testing shall be in accordance with Section 510.5 .3 of the IFC. The complete ERRCS shall be tested for functionality by the installer prior to requesting fire marshal inspection. Final acceptance testing shall be witnessed by the fire inspector. Prior to requesting the final acceptance test the installer shall pre-test the system and provide to [ERRC\\_Program@piercecountywa.gov](mailto:ERRC_Program@piercecountywa.gov) the following:

1. A floor plan for each floor indicating the location of all equipment and devices with an overlay identifying the testing grids required by IFC 510.5.3 (with the test point identified within each grid), those grids which are “general” and those identified consistent with this document as “Critical Communication Areas”.
2. A grid by grid result of the testing indicating the strength of outbound and inbound radio signals, whether the inbound or outbound signal strength meets required criteria and whether or not the DAQ 3.4 is achieved.
3. A final certification that the system as designed and installed meets the requirements of the IFC on all frequencies.

Fire Prevention will issue the permit (FB1A) after code compliance has been demonstrated on the pretest materials. Once pretest materials have been approved and on-site acceptance and operational test will be performed by the installer and witnessed by the fire marshal. The on-site testing will include the following:



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1. A visual inspection of the physical installation of the ERRCS.
2. A test of the system operability under normal, battery and backup power supplies each operating under load for a minimum of one hour.
3. The fire marshal witnessing the test shall select several areas on each floor requiring general communication capability. At each selected location, a spectrum analyzer and/or other suitable test equipment shall be used to evaluate outbound and inbound signal strength for all required frequencies. In each selected test area, the fire marshal shall also conduct DAQ testing utilizing radio equipment used by the responding jurisdiction.
4. The fire marshal witnessing the test shall verify radio signal strength and audibility in each critical communication area.
5. The monitoring equipment shall be tested in normal and emergency power mode for system operability and shall include not less than five trouble signals of equipment selected at random.

Failure of any portion of the test shall render failure of the entire ERRCS with those failed components corrected and retested prior to final system acceptance. After two inspections a re-inspections fee will be charged.