SAN BRUNO FIRE DEPARTMENT
POLICIES AND STANDARDS MANUAL

Emergency Responder Radio Systems
Plan Check Requirements and Technical Design Information
(Version 3.0)

Policy No.: ADM-39 Adopted: 2020 Review date: 01/2020
Amended:

PURPOSE & SCOPE

The California Fire Code requires adequate radio communication capabilities for first responders (fire, police and EMS personnel) in new buildings. This capability is based upon the existing coverage levels of the public safety communications system for each jurisdiction. If existing radio coverage levels do not provide adequate communication capabilities within a building, an Emergency Responder Radio Coverage System (ERRCS) shall be installed to allow for such coverage.

POLICY

It is the policy of the San Mateo County Fire Chiefs to provide direction on the installation, compliance testing, and recordkeeping of emergency responder radio coverage systems to promote consistent required information to installation and testing contractors.

REFERENCES

California Fire Code, Current edition

NFPA 72 – National Fire Alarm and Signaling Code

NFPA 1221 – Standard for the Installation, Maintenance and Use of Emergency Services Communications Systems

VENDOR QUALIFICATIONS

Designer

1) On new systems designed for existing structures as well as new structures; a Professional Engineer (P.E.) licensed in the State of California shall approve by affixing their P.E. seal to the design documents.

Testing

2) For system acceptance a certified IEEE—WCET (Institute of Electrical and Electronics Engineers – Wireless Communications Engineering Technologies Certification) or other local fire authority approved professionally certified person shall test and sign-off on testing within the structure. The IEEE-WCET or other approved professionally certified person shall inspect and test on an annual basis – sign a record of completion attesting to the proper function of the system on all bands and frequencies designed into the system.

a. NOTE – this should not be a verification of the system design OR an acceptance test certification between the vendor and building owner. This test is functional and should be performed after acceptance testing is completed between the building owner and the installation vendor. This test should serve as the (ERRC System Qualification) – in other words, this test would certify to the local Fire Authority that the system is functioning

Installer

3) Installation of approved ERRC systems shall be conducted by a State of California licensed C-7, C-10 or C-16 contractor.

SYSTEM DESIGN SPECIFICATIONS

1) Design shall include individual radio frequencies as determined by the Authority Having Jurisdiction (AHJ), see below. Half-duplex and full-duplex channels only.
    a. Radio channels shall be filtered in accordance with FCC bandwidth limitations for those specific radio frequencies
        i. Example – if a VHF radio channel is licensed at 12.5 kHz bandwidth – filter in the system shall correspond to the same bandwidth
2) Simplex channels will not be added to any system as they can cause irreparable harm in the form of interference.
3) Design shall include an Emergency Power Off (EPO) switch that when activated is capable of removing power from all active electronics in the system.
    a. <u>EPO shall be located adjacent to the Fire Alarm Control Panel (FACP).</u>
        i. The EPO should be the Knox© brand power shutoff box.
    b. This is for the purpose of interference mitigation. Systems should be left in the "on" position under normal conditions
4) Design shall be flexible to allow for additions and deletions of radio frequencies and radio bands as specified by the FCC CFR 47 Part 90 for public safety.
5) Radio Frequency emissions generated within the building (downlink frequencies within the building OR captured signal to a portable radio (subscriber unit) generated within the building from the DAS) shall be controlled and shall not propagate outside of the structure.
6) All systems shall be designed not to exceed CFR 47 FCC Part 90 for Public Safety radio frequency bandwidths per individual frequency utilized within the system.

7) Radio frequencies and radio frequency bands not used in the system shall be filtered for signal attenuation at or below surrounding noise floor as measured at the location of the system.

PROCEDURES

Upon receipt of an ERRCS plan submittal for review and approval of a fire permit, the installing contractor shall be given the Emergency Responder Radio System Information Sheet (Attachment A) to be completed and returned to the local fire authority.

1. The local fire authority shall update the master database (found here) by entering the information obtained from Attachment A. To obtain access to the full database please contact comms@smcfire.org.

2. Before any compliance testing of an ERRCS, the testing contractor shall complete the Emergency Responder Radio Coverage System Testing Requirement Sheet (see Attachment B) and return to the local fire authority. This describes the proper testing procedure involving law enforcement and fire dispatch centers. Approval and notification of such testing must be made prior to commencing the test.

3. Frequency Testing: Conduct all tests on a secondary channel whenever possible. If a test fails on a secondary channel, re-test the failed grid on the primary channel. If the grid passes on the primary channel, you may pass that grid. Measure and record the signal level near the donor antenna for each channel. See appendix for appropriate channel to use.

    I. **For the VHF fire channels:** Obtain signal strength measurements on the appropriate zone Command Channel (11, 21, 31 or 41) and Command 51. If signal levels are comparable between zone command channel and Command 51, commence testing on Command 51. Always attempt testing on a secondary channel first.

II. **For the UHF law channels:** Obtain signal strength measurements on local police agency Channel 1, local police agency Channel 2 and CWMA Green. If all signal levels are comparable, Commence testing on local police agency channel 2. Always attempt testing on a secondary channel first.

III. **700 MHz P25 system:** Obtain signal strength measurements from the control channel and test audio on the COCOM4 talk group.

4. The installation of ERRCS shall be done under a fire permit, approved by the local fire authority.

Attachment 1:

EMERGENCY RESPONDER RADIO COMMUNICATION SYSTEM INFORMATION SHEET

Building Address: _____

Building Name: _____

Administrative contact name (24hr/7days): _____

Administrative contact phone (24hr/7days): _____

Administrative contact email (24hr/7days): _____

Technical contact name (24hr/7days): _____

Technical contact phone (24hr/7days): _____

Technical contact email (24hr/7days): _____

ERRCS Equipment Make/Model: _____

System shutdown instructions: _____

_____

Complete list of transmit / receive frequencies:

_____ _____

_____ _____

_____ _____

_____ _____

Attachment 2:

EMERGENCY RESPONDER RADIO COVERAGE SYSTEM TESTING REQUIREMENTS

1. Compliance testing of emergency responder radio coverage systems shall be done under the following conditions:
    a. Complete and submit this sheet to the local fire authority for approval at least 7 days prior to testing.
    b. Contact all affected dispatch centers at least 30 minutes in advance of testing for notification. County Communications fire dispatch center: 650-368-1421. Contact local law enforcement agency for dispatch center contact information.
    c. Testing must be performed ONLY between 3:00am-6:00am, 7 days a week.
    d. The radio technician must contact the dispatch centers when testing is complete.
    e. Test results must be submitted to the local fire authority for review and approval as part of final approval of fire permit.
    f. 30 minutes prior to testing, the technician performing the test must contact the dispatch centers and report the information below.
        i. Testing address:_____
        ii. Radio frequencies/channels to be tested:_____
        iii. Expected dates/duration of testing:_____
        iv. Third party testing company:_____
        v. Name: _____
        vi. Phone: _____
        vii. FCC License #: _____
        viii. Name and contact number of technician on site (in the event testing must be stopped):_____
        _____
        ix. Does testing require Dispatcher interaction?Yes_____No_____