Salt Lake City Fire Department
Technology Services Division

Fire Marshal Policy on Installation and Maintenance of Public Safety Radio Repeater systems in Salt Lake City

July 9, 2020

Scope

If there's an emergency in your commercial building, we want to ensure public safety personnel can communicate effectively. Modern construction materials often block firefighter and police radio signals, which can greatly disrupt life safety and property conservation activities. That's why the State of Utah and Salt Lake City have adopted Section 403.4.5 of International Building Code, and Section 510 of the International Fire Code (IFC), which requires installation of an emergency radio repeater communication system (ERRCS).

An ERRCS system typically involves placement of an antenna on a building to amplify internal radio signals and ensure first responders can communicate effectively with 911 dispatch and emergency personnel outside the building. The ERRCS amplifier is connected to a distributed antenna system, consisting of discrete, strategically placed antennas on every floor of the structure. Systems are commonly tied to the fire alarm system, which can provide a one-stop monitoring location to make sure your facility is safe and ready for any emergency.

Requirements

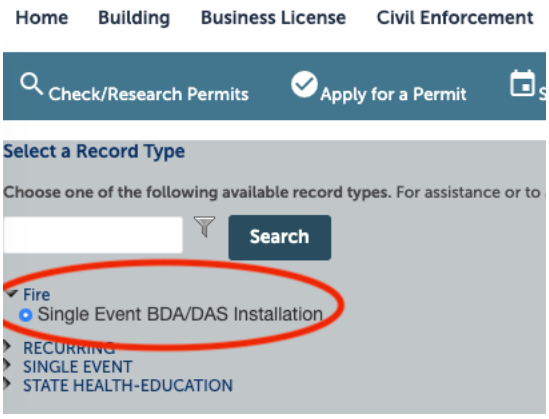
Per International Fire Code section 510.1 new buildings shall have approved radio coverage for emergency responders within the building based on the existing coverage levels of the public safety communication system. Exceptions are listed in the code.

International Fire Code section 510.2 indicates existing buildings shall be provided with approved radio coverage for emergency responders.

Permit Process

All radio repeater systems in Salt Lake City require a permit from the Fire Department. We permit these systems to ensure they're going to work well when needed during an emergency, and to ensure systems don't cause problems on the statewide radio network, which happens occasionally. Also, the FCC requires our consent before a system can be placed into commission. Here's the process:

1. Apply for a permit at our website, https://aca.slcfire.com. The application is under the general "Fire" section. Be sure to upload iBwave drawings, ERRCS specifications, and cut sheets of the equipment being installed and the proposed design. Also, we need the contact information of whomever will be monitoring your system in the long-term.



2. Once the application has been evaluated for compliance with the codes and standards, authorization will be provided to begin system installation.
3. Upon initial installation, a low-voltage inspection will be conducted by the SLC Building Department, to ensure the system conforms to fire protection standards. In new construction, this inspection should be initiated before substantial building completion
4. Once ready for commission, we require notification before the system will be activated for the first time, so we can monitor our radio system. An inspection will need to be scheduled with a SLC radio technician, who will test effectiveness
5. Upon successful inspection, a permit and FCC license holder authorization letter will be provided to the building owner

Note: your temporary certificate of occupancy may be withheld until this process has been completed.

Permit Fees

Salt Lake City Fire charges a permit fee of $205.00, which includes plan review and public safety delivered audio quality (DAQ) inspection. The Building Department low-voltage inspection fee is available in the Salt Lake City consolidated fee schedule.

Recertification

Your radio repeater system will need to be inspected annually for proper function as outlined in International Building Code. We use The Compliance Engine for annual system inspection reporting. Your permit expires 5 years after the date of issue – at that time you'll need to apply for a new permit.

Radio Specifications

Salt Lake City operates its own radio system. Our public safety partners from other cities, who may assist us during an emergency, use the Utah Communications Authority radio system.

Specific frequencies, frequency ranges, and donor radio sites are included in Appendix B of this document.

Salt Lake City is in the process of moving from analog to digital P25 phase II radio communications. We anticipate this will be completed no later than early 2022.

Appendix A: Self-Certification Form
Appendix B: Technical References

Change Log

July 15th 2020 – Document approved by Fire Marshal Paul Paulsen

Salt Lake City Fire Department

Radio Repeater Self-Assessment – Appendix A

Purpose of Form: Use this form to document that a building (or portions of a building) have adequate signal strength for emergency responder radios after installation of an ERRCS. This form may be also utilized to request a waiver of system installation. When this form is used in conjunction with a new construction projects, shell and core construction should be completed prior to radio signal testing and assumptions should be provided for additional signal limitations from anticipated tenant improvements.

Coverage Meets Code Requirements throughout the building	Yes	No
Coverage does not meet code requirements in some or all or of the building	Yes	No

BUILDING INFORMATION
Building Name
Building Address

TESTING COMPANY, TECHNICIAN AND EQUIPMENT	
Testing Company Information	
Company Name	Contact Email Address
Mailing Address	Contact Phone Number
Contact Name	
Technician Information	
Technician Name	Technician Phone
Technician FCC Certification GROL Number, or equivalent certification	

Specify manufacturer training received and year if applicable		
Testing Equipment Used for the Assessment		
Spectrum Analyzer (or comparable scanning receiver technology) Make / Model		
Spectrum Analyzer (or comparable scanning receiver technology) Calibration Date		
RADIO COVERAGE ASSESSMENT RESULTS		
Date of Assessment		
Noise floor level measurement before and after system activation		
PASS The entire building in its current configuration provides adequate signal coverage in 95% of all areas of each floor of the building, and 99% of critical areas as defined by International Fire Code Section 510, 2018	Yes	No
FAIL The building area provides inadequate signal coverage. Notes:	Yes	No
REQUIRED DOCUMENTATION		
A copy of the of the following documents is attached for the fire code official		
Grid diagram for each floor, showing test signal strengths in each floor, and showing location of each critical area, in iBwave format.	Yes	No
Copy of the general radiotelephone operator's license or certificate of in-building system training for the technician listed on this form	Yes	No
The form and attachments are stored in the fire command center or building engineer's office and submitted to the Salt Lake City Fire Department	Yes	No

ATTESTIATION		
By accepting this statement, I the technician shown on this form, certify that I have properly assessed radio signal strength following NFPA standards, and I have accurately provided results, indicating whether the building have signal strength meeting the requirements of International Fire Code Section 510, 2018	Yes	No
Calibration performed by firm (qualified firm name)		

Salt Lake City Fire Department

System Technical Specifications – Appendix B

Authority Having Jurisdiction

Salt Lake City Fire Prevention Bureau
Salt Lake City Radio
Attention: SLC Fire Marshal
PO Box 145520
Salt Lake City, UT 84114-5520

Primary Contact
David Herrmann
Salt Lake City Fire Department
801-440-9111

Emergency radio repeater systems installed in Salt Lake City are required to meet the following requirements. These are in addition to those requirements of IFC Section 510 (2018), NFPA 1221 (2016), and NFPA 70 (2017)

1. Ability to amplify signals on both 700 and 800 MHz spectrum
2. Ability to automatically prevent oscillations – documentation is required
3. Ability to incorporate all channels in the Salt Lake City radio system, and those used by our regional public safety partners. For Class B systems, the frequency ranges are as follows:

Salt Lake City	Salt Lake City Backup	UCA
WQLF999	WQLF999	WPRR826
855.2375-860.9625c	854.6125 - 860.4875a	851.875 – 853.5125a

Please contact us if you need specific frequencies for a Class A installation.

Primary Donor Site

Salt Lake City and UCA
City Creek Peak
40°48’25.8” N 111°52’51.8” W
Effective Radiating Power 75 watts

Secondary Donor Sites

Salt Lake City
Farnsworth Peak
Effective Radiating Power 75 Watts

UCA
Jordon Commons Tower
Effective Radiating Power 75 Watts

4. System diagrams and test results must be in iBwave format. The document must include propagation, compliance, and SNR reports
5. Although Section IFC 510 requires system certification by an FCC GROL technician, certification from the equipment manufacturer may be an acceptable substitute. This will be determined on a case-by-case basis.

Preferred System Components

1. Systems with UL2524 rating are preferred but are not currently required. It is anticipated they will be required by our jurisdiction in the near future