Essex County Fire
Standard Operating Guideline

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Minimum Standards for Radio Purchases & Programming		

Scope

This Standard Operating Guideline applies to all fire departments within Essex County.

Purpose

The purpose of this document is to ensure that all member communities purchase and operate radios with minimum equipment and programming capabilities.

Definitions

1. **Advanced Digital Privacy (ADP)**: An optional encryption feature that may be included on some radios, it is based upon a 40-bit, Type 4 algorithm.
2. **AES-256**: Advanced Encryption Standard (AES)-256 is a specification for the encryption of electronic data established by the U.S. National Institute of Standards and Technology, it is based upon a 256-bit, Type 3 algorithm.
3. **Digital Mobile Radio (DMR)**: A limited open digital mobile radio standard defined in the European Telecommunications Standards Institute Standard and used in commercial products around the world.
4. **MDC**: Motorola Data Communications
5. **MDC-1200**: A Motorola two-way radio low-speed data system using audio frequency-shift keying. The data is sent in bursts over the radio system's voice channel at a rate of 1200 baud.
6. **MTCP**: Massachusetts Tactical Channel Plan
7. **NXDN**: An open standard for public land mobile radio systems, that is, systems of two-way radios (transceivers) for bidirectional person-to-person voice communication. It is an advanced digital system that supports encrypted transmission and data, as well as voice transmission.
8. **Project 25 (P25)**: A suite of standards developed to provide digital voice and data communication systems suited to public safety and first responders.
9. **SIEC**: Statewide Interoperability Executive Committee
10. **Time Division Multiple Access (TDMA)**: TDMA is a channel access method for shared-medium networks. It allows multiple users to share the same channel at what appears to them to be the same time.

Guideline

It is highly recommended that radio equipment purchased or upgraded, after this document has been accepted, comply with the minimum standards set forth for purchases and programming capabilities.

Minimum Requirements

1. **Radio (RF) Equipment Purchases**
   a. Radios should be capable of supporting a minimum of 96 unique channels and at least three (3) zones. (In determining the channel capacity needed, agencies should consider the impact of the TICP / Interop channels in their radios to ensure said capacity is not exceeded)
   b. If possible, it is recommended that departments purchase dual-band (UHF/VHF) radios.
   c. Radios purchased should include a front and top digital channel readout.
   d. Radios should be capable of MDC-1200 signaling.
   e. It is highly recommended that radios purchased areP25 phase 2 TDMA digital operations ready; however, if cost-prohibitive, radios must be at least P25 capable. P25 is the national public safety standard in public safety digital communications. Other digital formats, such as DMR and NXDN, will not be supported. However, DMR or NXDN may be contained in the radio as long as the radio can operate using P25 emissions.
   f. Although not required, digital encryption is an acceptable option that can be added to radios to support secure transmissions. The nationally recognized standard for encryption is AES-256, however other formats including but not limited to ADP encryption can be added as an option as long as AES-256 is included in the radio options as an available format. If the agency elects to have encryption capability, the ECFCA highly recommends multi-key encryption.
   g. All purchases shall comply with the minimum requirements for RF Equipment Purchases as established by the SIEC.

2. **Radio Programming**
   a. **Channel Plan** –
      i. Compliance with Essex County Fire Chiefs Association (ECFCA) radio plan, as approved and amended.
      ii. Compliance with the Massachusetts Tactical Channel Plan, as approved by the Statewide Interoperability Executive Committee (SIEC), as approved and amended.
      iii. All channels shall be programmed using approved naming conventions.
   b. **Time out Timer** –
      i. It is highly recommended that mobile and portable radios be programmed with the time out timer enabled and set at 45 seconds.
      ii. Repeaters and other associated infrastructure should be set for an infinite time out timer. If departments are not comfortable using an infinite time out timer, it is recommended that it be set at the maximum allowable time out timer.
   c. **Radio Inhibit** –
      i. All radios should be programmed with the radio inhibit option enabled, if available and capable. This feature, when enabled, can remotely remove select radio(s) from service if they are lost or stolen.
   d. **Encryption** –
      i. The ECFCA Communications Sub-Committee strongly recommends that encryption is NOT used on any fire department primary or fireground channel.
   e. **Programming Template Review** –

   i. It is recommended that proposed programming templates be brought before the ECFCA for review before deployment in field units. (NOTE- The ECFCA Communications Sub-Committee is a resource that can assist in determining accuracy and provide best practices/recommendations; it is not approving the template)

 f. **Radio Identifier** – Radios should be programmed using a unique hexadecimal identifier. *See ECFCA guideline on Radio Identifier Numbering System*.

Additional Resources

The ECFCA Communications Sub-Committee is available as a resource to every fire department and may be able to provide further guidance or best practices with equipment purchases, programming, or other communications specific concerns.