

# National Multi-Agency Coordinating Group Firefighter Safety Advisory

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**Subject:** Narrowband and Wideband Operation

**Area of Concern:** Fire and Aviation Operations

**Distribution:** Fire and Aviation Personnel, Aviation Personnel and Radio Communications Personnel

Congress mandated a restructuring of the Federal Radio Frequency Spectrum requiring Federal Agencies to transition to narrowband FM frequencies (162.0000 to 174.0000 MHz) by January 1, 2005. In the process of implementing the conversion to a narrowband radio system, a number of conflicts have surfaced. It is critical for firefighter safety that radios used in wildland firefighting operations are able to properly function in both wideband and narrowband mode.

Safety teams, SAFENET and SAFECOM have verified these conflicts to the National Multi-Agency Coordinating (NMAC) Group. An Area Command (AC) team has been assigned to implement immediate action regarding this issue.

All equipment from the National Interagency Fire Center (NIFC) radio cache is narrowband and frequently maintained. However, most radios utilized by Wildland firefighters do not come from the cache.

## Identified Concerns:

- At times radios are issued with no training in wideband/narrowband operations.
- At times radio users do not know how to recognize wideband/narrowband conflicts.
- At times Communications Unit Leader (COML), Communications Technician (COMT) and Electronic Technicians are not equipped or trained to program and field service all brands and types of radios.
- Radio specifications in engine, crew and aviation contracts are often too vague to ensure proper radio equipment.
- Not all cooperators and Federal agencies are narrowband capable (repeaters, handholds or mobiles).

The NMAC Group, and others, have issued safety advisories and alerts highlighting some of these issues.

### Indicators of Narrowband/Wideband Incompatibility:

- Wideband radios operated in a predominately narrowband environment may be much louder (loud deep voices seem to be problematic), “choppy”, inaudible or distorted with feedback.
- A narrowband radio transmitting to a wideband radio may sound very soft and quiet in comparison to a wideband transmission.
- Repeaters, used in a mixed mode environment, may lock open, then reset; effectively stopping all transmission for up to three minutes.
- Some models of radios do not indicate on the screen wideband or narrowband mode, or those that do, falsely indicate the mode.
- In multi-jurisdictional incidents there now may be an inability to communicate with cooperators.

### Programming/Maintenance:

- Verification of the operating mode, either wideband or narrowband is essential. The proper mode has to be set by cloning, programming from a computer, or manipulating the radio in some fashion, depending on the model of radio. When reset, the radio would need to be tuned.
- Field keypad programming of frequencies does not necessarily change the operating mode of the radio. Narrowband frequencies have four decimal places (i.e. 166.6725) instead of three as in a wideband frequency (i.e.166.675). Adding the fourth decimal place from the radio keypad does not mean the radio is operating in a narrowband mode.
- Local unit radio shops have password protected handhelds and mobile units, which can not be programmed or cloned on incidents.
- Narrowband radios need to be tested and tuned annually.

### Mitigation Measures:

- Frequency guides, Incident Action Plans, communication plans, and other documents displaying radio frequencies, must be published in a format which includes tones and mode of operation. All briefings must include frequencies in a format similar to the one below to ensure accurate and positive communications:

Function	Rx Frequency	Rx Tone	Tx Frequency	Tx Tone	Mode
Air-Ground	170.0000	None	170.0000	No tone	Narrow
Big Repeater	169.8750	None	170.4750	114.8	Narrow
State Tac One	151.475	None	151.475	None	Wide

- Report all issues and conflicts to the local radio technician, frequency managers or Communications Unit Leaders on an incident. Reports must be detailed as to what, when, where and the type of equipment involved. NFES radio kit numbers should be a part of the report as well.
- Do not ignore issues or conflicts.
- Do not employ untested “work-arounds”; consult with electronics technicians and telecommunications specialists.
- Radios that are not compatible should be removed from service.

### **Diagnostic Techniques:**

Testing of equipment by users can assist in the determination of operational modes and detect problems prior to incident deployment. These field tests should not be viewed as the only tests necessary.

- Start with a radio that is operating properly (i.e. tuned correctly and operating in the narrowband mode).
- Tests should be conducted at a uniform distance between radios. Distances less than 15 feet will likely yield false results. Short distances may mask problems; therefore tests should be conducted with the radios miles apart when possible.
- Primary simplex and repeater channels should be tested.
- Ensure the transmission is loud and clear. Test should be more than a routine “ten” count. Use the following text for the test.
  - “Radio check. Testing 1,2,3,4,5,6,7,8,9,10. How do you copy?”
  - Responder should reply, “Loud and clear. Testing 1,2,3,4,5,6,7,8,9,10. How do you copy?”
- Results should be weighed against the indicators of incompatibility listed above. If transmissions are not loud and clear, it may indicate a radio problem that should be investigated by a radio maintenance specialist.
- Testing should include: dispatch, mobiles, handhelds, repeaters and base stations.

**Summary:**

Fire and aviation personnel should always maintain a high level of situational awareness and be prepared to mitigate hazards. This may require alternate means of communications, adjustment in tactics and/or development of new fire strategies.

The key is to establish reliable communications before going into the field. Radio problems that occur as described above, or other unusual FM communication difficulties, should be investigated immediately. Check all radios to ensure they are properly programmed in the narrowband mode. Additional references for radio programming are available at <http://radios.nifc.gov>.

Issues that can not be resolved locally at your forest, district or state can be addressed to the Communications Duty Officer at the National Interagency Incident Communications Division at (208) 387-5644 or by visiting <http://radios.nifc.gov>.

Finally, if a radio problem adversely affects ground or aviation operations, or causes an unsafe situation, please remember to document the event by submitting a SAFENET ([www.safenet.nifc.gov](http://www.safenet.nifc.gov)) or SAFECOM ([www.safecom.gov](http://www.safecom.gov)).

The NMAC is committed to resolve these problems. Firefighter and public safety are our highest priorities.

*//s// Don Artley*

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The National Multi-Agency Coordinating Group