



Technology Briefs are published periodically by NPSTC and its member organizations to highlight awareness and provide knowledge on technology issues of importance to the first responder community.

October 2009: Are You Ready? Plan Now for Narrowbanding

NPSTC's Home Page features a digital clock counting down the days, hours, minutes, and seconds until mandatory narrowbanding begins. In 3 short years, all radio systems operating at frequencies below 512 MHz will be required to narrowband, i.e. begin operating in 12.5 kHz channel bandwidths instead of the current 25 kHz channel bandwidths in use today or meet the efficiency standard of two talk paths in 25 kHz. The Federal Communications Commission (FCC) has mandated that narrowbanding be complete by January 1, 2013. What does this mean to you? It means that many existing systems operating in these bands will need to be modified or replaced.

But, the clock may be ticking even more quickly than you think. By January 1, 2011—a little over a year away—the FCC will no longer accept new or modified applications that exceed the narrowbanding guidelines, which means that a modification to expand the interference contour of an existing station will not be accepted. It means that the manufacture or importation of equipment will be limited to 12.5 kHz technology. So if an agency's 25 kHz bandwidth-only equipment is damaged or lost, replacement equipment may not be readily available after January 1, 2011. Another thing to consider is the fact that it is not unusual for public safety agencies to expand or change the geographic areas for which they are responsible, but these changes would not be permitted by 2011 for systems that operate exclusively at 25 kHz, unless they meet the efficiency standard, e.g. utilize two or four slot TDMA.

And wait, there's more. Although a deadline for the second phase of narrowbanding, conversion to 6.25 kHz channel efficiency, has not been specified by the FCC for VHF/UHF licenses, a deadline has been established which requires 700 MHz channels to operate at 6.25 kHz efficiency by January 1, 2017.

There Are Good Reasons for Narrowbanding

The FCC made the decision to narrowband this part of the spectrum to promote more efficient use of the highly congested VHF and UHF land mobile bands. There is often not enough spectrum available for licensees to expand their existing systems or implement new systems. The FCC expects that as licensees convert to equipment that operates on the narrower channel bandwidths, new channels will become available, and that the narrowband conversion will encourage the development and use of new more spectrum-efficient technologies.

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Take a Narrowbanding Quiz: True or False

Narrowbanding requires licensees to implement digital technology.

False. There is no digital requirement.

Licensees will end up with twice as many channels.

False.

Hundreds of new channels will be available in 2013.

False.

Failure to narrowband will result in secondary status.

False. Failure to narrowband will be illegal and stations will have to go off the air.

Interference may occur to existing systems.

True. Wideband operations may experience interference from new narrowband stations

Interoperability may be negatively impacted.

True. Until all entities transition to narrowband, some may operate on interoperability channels with wideband equipment while others are at narrowband. Distortion or volume discrepancies may occur.

Paging channels need not narrowband.

False. With the exception of two channels only—152.0075 MHz and 157.4500 MHz can remain 25.0 kHz bandwidth.

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There are several other misconceptions in the public safety community in addition to the ones noted in the True or False Quiz. Narrowbanding is not required in 800 MHz; it only applies to spectrum below 512 MHz (low band, 30-50 MHz and 220 MHz are not included). Another rumor is that the FCC will allow continued operation at 25 kHz after January 1, 2013, by waiver or extend the deadline as they did for the Digital Television transition. "This is extremely unlikely," says Ralph Haller, NPSTC's Chair. "The FCC has taken a hard line policy on narrowbanding."

What You Need to Do Now

Start planning now especially in the context of your agency's budget cycle. "Narrowbanding is the next serious challenge to interoperability, and the deadline looms," say John Penido, Fire Chief, City of San Marino, California, Chair, CalSIEC. "CalSIEC needs to educate our constituents and their governing bodies who will be asked to pay for the cost of narrowbanding."

"The California fire service has committed to beating the 2013 deadline by completing this daunting project in 2010, no mean feat given our budget troubles!" he says. "But our federal partners have already done it, so we need to get it done now if we want to continue to talk with each other. Given our heavy reliance on mutual aid and voice communications, all California fire agencies will need to make the switch together in order to remain interoperable."

What Else Should You Do?

1. Inventory equipment subject to narrowbanding. Most equipment manufactured since 1997 has a narrowband mode so narrowbanding may be no more than a programming issue.
2. Get a funding cycle approved.
3. Establish a schedule to meet the 2013 date. "Develop a wideband-to-narrowband conversion plan that reflects well-coordinated logistical and implementation strategies needed to accommodate the replacement and installation of any new narrowband-capable off-site base or repeater station radio(s) needed in advance," says Nick Ruark, General Manager, Quality Mobile Communications, LLC. "The plan should include reprogramming all radios in a system as close to simultaneously as possible to assure minimal disruption to ongoing radio communications operations. Work closely with a professional two-way radio service vendor during the development of any system conversion plan to insure there are no surprises during the actual narrowbanding cutover."
4. Determine if additional sites will be needed to compensate for the narrower bandwidth.
5. Determine if pagers will require replacement.
6. Ruark suggests that agencies schedule and coordinate with their radio service vendor, as soon as possible, ascertaining the dates and times for the actual system conversion (or cutover), and making certain that all radio users have been advised in advance and are aware of the process. Also make sure that all handheld and mobile radios are readily available for reprogramming at pre-scheduled times.
7. Modify existing licenses for narrowband, including new sites, if needed, working closely with frequency coordinator.
8. Notify the FCC of conversion through license modification to remove wideband emission designator(s).

Additional Resources

The International Municipal Signal Association (IMSA) and the International Association of Fire Chiefs (IAFC) have issued an excellent guide to narrowbanding, available in print or electronically at IMSAsafety.org.