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.

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. Last year NPSTC issued this Tech Brief on the need to plan for narrowbanding mandated by the Federal Communications Commission (FCC). On June 30, 2010, with a little over 2 years to go, the FCC again reiterated its commitment to the January 1, 2013 narrowbanding deadline.

Certain Interim Narrowbanding Deadlines Extended

There is some good news. In response to a stay request filed by NPSTC on September 29, 2009, the FCC in its June 30, 2010 Order, extended two of the interim VHF/UHF narrowbanding deadlines that were to go into effect on January 1, 2011. The original requirements would have required a 6.25 kHz equivalent mode in all new radios and would have made it difficult to secure new 25 kHz equipment.

The FCC extended the following interim 2011 requirements until January 1, 2013:

- Prohibition on the manufacture or import of equipment that includes a 25 kHz efficiency mode
- Requirement that equipment submitted for certification include a 6.25 kHz efficiency mode

However, the FCC declined to extend the following interim deadlines which remain in effect for January 1, 2011:

- Prohibition on new or expanded 25 kHz operations. Such requests will require individual waivers and be handled on a case-by-case basis
- Prohibition on manufacturer certification of equipment which includes a 25 kHz mode

FCC Narrowbanding Requirements

By the start of 2013, all radio systems operating at VHF (150-174 MHz) and UHF (421-512 MHz) Part 90 frequencies 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 equivalent efficiency standard of two talk paths in 25 kHz.

But, the clock may be ticking even more quickly than you think. By January 1, 2011—a few months away— the FCC will no longer accept new or modified applications that exceed the 12.5 kHz efficiency narrowbanding guidelines, which means that a modification to expand the interference contour of an existing 25 kHz efficiency station will not be accepted. 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 after start of 2011 for systems that operate exclusively at 25 kHz efficiency. They must meet the 12.5 kHz efficiency standard, e.g. operate on 12.5 kHz channels or in two or four slot TDMA.

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. *Licensees remain on same channel center but reduce the bandwidth.*

Hundreds of new channels will be available in 2013.
False.

Failure to narrowband will result in secondary status.
False. *As noted above, stations will not be allowed to operate on a secondary basis. Failure to narrowband will be illegal and stations will be subject to enforcement action, including fines and loss of license.*

Interference may occur to existing systems.
True. *Remaining 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, volume or coverage discrepancies may occur.*

Paging operations need not narrowband.
False. *With the exception of two public safety paging only channels only (152.0075 MHz and 157.4500 MHz) and 11 business/industrial paging only channels which can remain 25 kHz bandwidth, all paging operating on any Part 90 channel must narrowband.*

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What does this mean to you? It means that many existing systems operating in these bands will need to be modified or replaced.

There Are Good Reasons for Narrowbanding

Over the last two decades, 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 (Part 90) 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.

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 the VHF and UHF Part 90 spectrum (low band, 30-50 MHz and 220 MHz are not included). 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.

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." The FCC has consistently reiterated the 2013 deadline, including in the December 11, 2009 Public Notice in which it also clarified that stations that do not comply cannot operate on a secondary basis and will be subject to enforcement actions such as fines and license revocation, and the June 30, 2010 Order noted above. The FCC limits the manufacture, import, and marketing of equipment to at least 12.5 kHz efficiency technology after end of 2012. So, if a licensee chooses not to comply, 25 kHz efficiency equipment may not be readily available after January 1, 2013.

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.