

WHITE PAPER:

Meeting the FCC Narrowbanding Mandate for Two-Way Radios

Executive Summary

The Federal Communications Commission (FCC) initially set the narrowbanding initiative in motion in 1992 with the ultimate objective of increasing capacity and efficiency for the industrial/business and public safety radio pools in the private land mobile radio services category. Specifically, it set forth that all “Part 90” business, educational, industrial, public safety, and local and state government two-way radio system licensees currently operating legacy wideband (25 kHz) voice dispatch or data/supervisory control and data acquisition radio systems in the 150-174 MHz (VHF) and 421-512 MHz (UHF) bands must make the transition to the narrowband technology (12.5 kHz).

Users who do not make the switch by January 1, 2013, face the loss of their communication capabilities. Although the migration deadline seems far off, it is necessary for organizations to plan well in advance.

This white paper describes the narrowbanding process and how it affects companies, public safety organizations, and other entities. It also discusses the FCC deadlines and suggests options to help users efficiently and effectively handle the migration process.

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Understanding the Narrowbanding Challenge

The best way to think about the Federal Communications Commission (FCC) and its “narrowbanding” initiative for two-way radios is to put it in terms of a music concert. Let’s say you have an event where there are more people who want to attend than there are tickets. The concert promoter, in such a case, has two choices. The resolution can be left to the secondary market—in this example, the scalpers and ticket brokers—to dictate the price of the tickets to concert goers. Or the promoter can add another concert date, increasing supply to meet the growing demand.

In this analogy, the FCC is like the concert promoter, the spectrum capacity is like the concert date, and the commercial, educational, and government users of two-way radios are like the concert goers. The FCC wants to increase the capacity—or spectrum efficiency—for these users, and the recent advances in two-way radio technology have created the wherewithal to make available more channels for wireless communication—or to continue the analogy, more concert dates.

What the FCC Requires

The FCC set the narrowbanding initiative in motion in 1992 with the ultimate objective of increasing capacity and efficiency for the industrial/business and public safety radio pools in the private land mobile radio services category. Specifically, it set forth that all “Part 90” business, educational, industrial, public safety, and local and state government two-way radio system licensees currently operating legacy wideband (25 kHz) voice dispatch or data/supervisory control and data acquisition radio systems in the 150-174 MHz (VHF) and 421-512 MHz (UHF) bands must make the transition to the narrowband technology (12.5 kHz).

Users who do not make the switch by January 1, 2013, face the loss of their communication capabilities. Although the migration deadline seems far off, the FCC is already moving ahead:

- The FCC will not grant applications for new voice operations or applications to expand the authorized contour of existing stations that use 25 kHz channels. Only narrowband authorizations will be granted.
- The FCC will prohibit manufacture or importation of new equipment that operates on 25 kHz channels. This will reduce the availability of new equipment for legacy radio systems and will affect how agencies and companies maintain and upgrade older systems.

“The transition to 12.5 kHz narrowband will result in more spectrum capacity for public safety agencies and commercial users in the VHF and UHF bands by increasing the efficiency of spectrum use.”

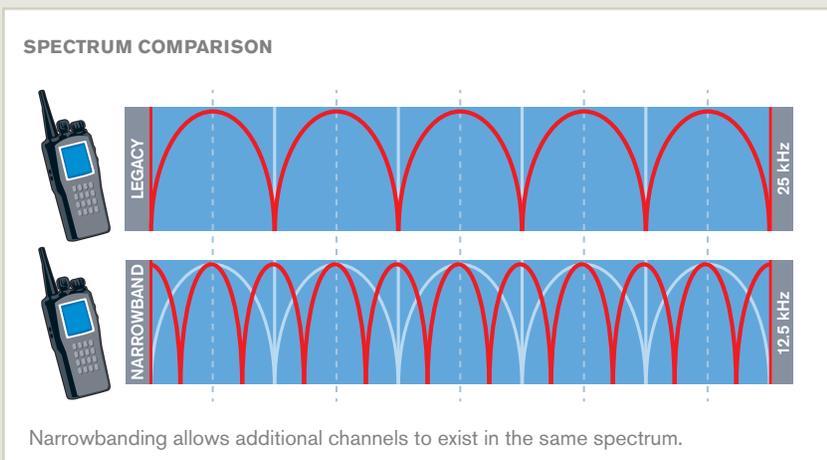
Jamie Barnett, Jr.
Chief
FCC Public Safety and
Homeland Security Bureau

“The FCC finally got to a point where it recognized that, with advances in technology, it could create more spectrum and drive potential subscription revenue. The demand was already there.”

Mark Behrends
National Sales Manager
LM Business and Industry
Icom America

Why Spectrum Efficiency is Important

“The purpose of the FCC narrowbanding mandate is to promote more efficient use of the VHF and UHF land mobile radio bands,” says Mike Gray, Vice President for LMR Sales at Vertex Standard, a leading two-way radio manufacturer. “Currently, these bands are so congested that often there is not enough spectrum available for licensees to expand their existing systems or implement new systems. Requiring licensees to convert their radio systems to operate on narrower channel bandwidths will allow additional channels to exist within the same spectrum.”



Industry leaders also expect the conversion to narrowband to spark the development and use of new technologies. “The narrowbanding initiative presents a win-win opportunity for everyone,” notes Jerry Denham, President and CEO of BearCom. “We are in constant dialogue with our manufacturing partners, who tell us that they are already in the development stages for a number of new products which will take full advantage of the narrowbanded spectrum.”

Denham adds that the litany of new products behind the curtain make it all the more important that business users engage a partner that is closely monitoring technological advances. “The narrowbanding initiative represents a double-edged sword for those entities that rely on wireless communications. You can take advantage of it and become a much more efficient user of such technology. Or you can simply ignore the initiative, wait until the last possible minute, and squander the potential benefits of new technology.”

The advantages are clear to the FCC’s Ruth Milkman, who is Chief of the FCC’s Wireless Telecommunications Bureau. She

“I’m very pleased that the commission has issued a public notice and that they have made it very clear about the consequence of failing to meet the 2013 narrowbanding date. This will assist the coordinators and others in convincing the licensees that they have to take this seriously.”

Ralph Haller
 Chairman
 National Public Safety
 Telecommunications Council

said publicly this summer that she envisions that “voice network capacity could eventually quadruple, enabling users, including public safety agencies in particular, to take full advantage of the capabilities of existing technologies to provide high-quality narrowband voice communications in these lower spectrum bands.”

Who is Impacted and What Will It Cost?

Land mobile radio (also known as Part 90) systems operating at 25 kHz efficiency in the following bands are affected:

- VHF: 150–174 MHz
- UHF: 421–512 MHz

Low-band radio systems (those operating below 150 MHz) are not affected.

For users who purchased two-way radios after 1998, chances are those devices already have the ability to operate in both wide and narrowband modes. The only cost to those users would be reprogramming and relicensing. Also, depending on the make and model of the radio, the cost of narrowbanding could be minimal to the user.

In a recent notice, the FCC implored users to “assess” current equipment and start planning. “To prepare for the migration, public safety agencies should start assessing their radio systems and planning for replacements or upgrades,” it wrote. “They should inventory their current equipment to ascertain what can be converted to 12.5 kHz and what will need to be replaced before January 1, 2013.” Most new equipment has the capability for both 25 kHz and 12.5 kHz operation, because any VHF/UHF radio equipment accepted by the FCC after February 14, 1997, had to have 12.5 kHz capability.

The Conversion Process

With help from a qualified two-way radio communications consultant, users can begin the internal business process of budgeting for and procuring any new narrowband-capable replacement radios, as well as creating a wideband-to-narrowband conversion plan that embraces the appropriate logistical and implementation strategies.

The next step is to apply for the appropriate FCC license. This, however, is not a slam dunk, according to the FCC. “An agency that is licensed for a 25 kHz wide channel is not guaranteed two

“Most two-way radio manufacturers understand that this is a significant opportunity to increase revenues by selling new products. But it will not be easy, since they are operating in a free market, where the business user has all the power to decide which product to purchase. That’s why you will continue to see new advances in radio technology.”

Hugh Johnston
Purchasing and
Product Manager
BearCom

12.5 kHz channels,” the FCC wrote in its recent notice. “Licensees will have to justify to the FCC why they need additional channels. Consideration of applications for new narrowband licenses will follow the same process as a new license application. As agencies migrate to narrowband operation, however, the pool of available frequencies will increase.”

Given the challenges, a two-way radio consultant has almost become a necessity. If the user already works closely with a radio provider, he/she may not need to look any further.

An effective consultant should be able to demonstrate all of the following attributes:

- Long history in RF communications
- Certified technicians and engineers
- Ability to assist with FCC frequency coordination, regardless of the size of the user’s operation and radio fleet

Start Planning Now

Ian Torok, Director of Technical Services at BearCom, suggests that users should be careful not to wait until the last minute to develop a migration plan to narrowband systems. “As the 2013 deadline looms closer, wireless providers will be busy assisting their current and new customers with new system designs and new radio purchases. Also, when the deadline passes and users are caught operating out of compliance, they risk losing their current FCC license, and reapplying can be costly and very time consuming,” says Torok.

Operating out of license and out of regulation will be costly. “The FCC has yet to specify how much,” Torok notes.

Torok recommends following these steps:

- *Take inventory.* Review current equipment to determine what can be converted to 12.5 kHz and what will need to be replaced before January 1, 2013. Most new equipment has the capability for both 25 kHz and 12.5 kHz operation because any VHF/UHF radio equipment accepted by the FCC after February 14, 1997, had to have 12.5 kHz capability. Contact your narrowbanding consultant to determine if your radio equipment is capable of operating in the 12.5 kHz mode.
- *Develop budget requirements, explore funding options, and establish a conversion and implementation schedule.* Include studies to ensure 12.5 kHz operation continues to provide similar

“It’s very important for users to know what happens if they don’t do this, because we’ve had questions along that line. The FCC kept its options open in terms of what happens. But the FCC will enforce compliance.”

Al Ittner

Senior Manager of Spectrum and Regulatory Strategy
Motorola

coverage. Once you determine possible equipment conversion needs, start developing funding and conversion schedules. Remember to coordinate your conversion with neighboring agencies and/or other affected organizations to help maintain continued interoperability.

- *Obtain new or modified licenses.* In addition to operating on narrowbanded equipment, users must be properly licensed by the FCC with the correct emissions designator. Contact your narrowbanding consultant for assistance.

The FCC was very stern in a recent public notice about the consequences of not abiding by the narrowbanding initiative, asking the following question—May a station that does not meet the January 1, 2013, narrowbanding deadline operate after that date on a secondary basis?—and then answering it: “No. As of January 1, 2013, the Commission’s rules will prohibit industrial/business and public safety radio pool licensees in the 150-174 MHz and 421-512 MHz bands from operating with wideband channels (unless their equipment meets the narrowband efficiency standard), even if the license still lists a wideband emission designator. Operation in violation of the Commission’s rules may subject licensees to enforcement action, including admonishments, monetary forfeitures, and/or license revocation, as appropriate.”

It then offered the following cautionary advice to the public safety sector in particular. “Public safety agencies need to aggressively develop a strategy to meet narrowband deadlines to avoid cancellation of existing wideband FCC authorizations. Although the migration deadline may seem far off, the long lead time and interim deadlines make it necessary for agencies to plan well in advance.”

BearCom stands ready to assist users with the challenge of migrating their two-way radio systems to meet the FCC’s narrowbanding requirements, whether it be compliance analysis, license preparation and modification, or equipment upgrades.

Frequently Asked Questions

- *Q Will I need to change the frequency band I’ve been using to be compliant with the FCC mandate?*
- *A No. Narrowbanding does not require moving to another frequency band. Licensees stay on the same channel center(s) but reduce the bandwidth of the channel(s) currently used from 25 kHz to 12.5 kHz.*

“Users should first verify that they have a current and valid FCC Part 90 radio station license and then create a database of their equipment. This will save time and effort, maximizing the use of the narrowbanding consultant. For those users who need help with the narrowbanding process, BearCom has an on-staff FCC licensing expert and several systems solution specialists who are standing by to assist them.”

Jerry Denham
 President & CEO
 BearCom

- Q** *If I need to upgrade my equipment, do I need to implement digital equipment?*
- A** No. The 12.5 kHz narrowband equipment is available in both analog and digital formats (e.g., Project 25). After January 1, 2013, analog and digital equipment must operate on a 12.5 kHz channel or achieve equivalent efficiency.
- Q** *What exactly does it mean to use technology that achieves equivalent efficiency?*
- A** For voice applications, the FCC efficiency standard can be met if equipment either operates on a 12.5 kHz channel or transmits at least one voice channel per 12.5 kHz of bandwidth. This means equipment operating on a 25 kHz channel bandwidth is compliant if the equipment supports two or more voice channels.
- Q** *Has the FCC established a schedule for mandatory migration to 6.25 kHz bandwidth?*
- A** No. The FCC has not yet set any date by which licensees must operate in 6.25 kHz efficiency.
- Q** *How can I determine if I have a valid FCC license?*
- A** Contact BearCom headquarters or your local branch for expert advice or assistance.
- Q** *If I currently have a license for a 25 kHz channel, will I automatically be entitled to license two 12.5 kHz channels?*
- A** No. Your 12.5 kHz channel will remain on the same channel center. Your current 25 kHz channel will not be split into two 12.5 kHz channels. You will need to justify and apply for the additional 12.5 kHz channels to the FCC through a certified frequency coordinator, such as BearCom.
- Q** *What will happen if I fail to comply with the FCC narrowbanding mandate? Can I continue to operate at 25 kHz efficiency on a secondary status after January 1, 2013?*
- A** No. The FCC will prohibit licensees from operating non-compliant equipment on a secondary basis. Non-compliance will be considered a violation subject to FCC Enforcement Bureau action, which may include admonishment, monetary fines, and loss of license.

By January 1, 2013:

- All licensees must convert to and operate in at least 12.5 kHz efficiency.
- Equipment capable of operating only at 25 kHz efficiency must be replaced.
- Existing certified dual-mode (25/12.5 kHz) equipment must have the 25 kHz mode disabled via software.

“Embrace the benefits that the FCC’s narrowbanding mandates offer you. Narrowbanding is more than just obligatory compliance dates. There are real opportunities to review your wireless communication requirements and enhance system objectives through new technologies and product feature sets that are now available.”

Mark Crosby
 President & CEO
 Enterprise Wireless Alliance



- Q** *Will migration to 12.5 kHz change my system coverage area?*
- A** Maybe. Conduct tests during conversion to ensure your system continues to provide similar coverage. Contact BearCom to help you determine if transmitter site changes or additions will be required to compensate for possible coverage change.
- Q** *I noticed that the FCC recently eliminated the interim narrowbanding deadlines that were scheduled to take effect at the end of this year. What was the FCC trying to accomplish with these deadlines in the first place?*
- A** The FCC had initially decreed that, after January 1, 2011, it would not grant applications for new voice operations or applications to expand the authorized contour of existing stations that use 25 kHz channels. In addition, it had planned, after that date, to prohibit the manufacture or importation of new equipment which operates on 25 kHz channels. The goal was to reduce the availability of new equipment for legacy radio systems.



For more information about meeting the FCC narrowbanding mandate for two-way radios, please contact BearCom at **800.527.1670** or **Solutions@BearCom.com**.

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