Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Proposed Amendments to the Service Rules Governing Public Safety Narrowband Operations in the 769-775/799-805 MHz Bands	)	PS Docket No. 13-87
	)	
National Public Safety Telecommunications Council Petition for Rulemaking on Aircraft Voice Operations at 700 MHz	)	RM-11433
	)	
National Public Safety Telecommunications Council Petition for Rulemaking to Revise 700 MHz Narrowband Channel Plan	)	RM-11433
	)	
Region 24 700 MHz Regional Planning Committee Petition for Rulemaking	)	WT Docket No. 96-86 PS Docket No. 06-229
	)	
State of Louisiana Petition for Rulemaking	)	RM-11577

REPORT AND ORDER

Adopted: October 17, 2014 **Released: October 24, 2014**

By the Commission:

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Heading Paragraph #

I. INTRODUCTION AND SUMMMARY

1. In this *Report and Order* we implement certain changes to the rules governing the 700 MHz public safety narrowband spectrum (769-775/799-805 MHz). We eliminate the requirement for narrowbanding of the spectrum by December 2016, which will enable licensees to extend the life of existing systems and will provide public safety with greater flexibility in determining the optimal future use of the band. In addition, we revise and update the technical rules for the band to enhance interoperability and open up certain channels to new uses, and we release reserve spectrum to provide additional capacity, particularly for licensees relocating to the 700 MHz band from the T-Band. These rule changes will enhance the ability of public safety licensees to use this spectrum to protect the safety of life and property.

2. In 2013, the Commission's *Notice of Proposed Rulemaking* (*NPRM*) sought comment on several proposals to amend the 700 MHz public safety narrowband rules.[1] First, the Commission asked whether it should extend or eliminate the December 31, 2016 narrowbanding deadline for 700 MHz public safety narrowband licensees.[2] Next, it sought comment on a 2010 National Public Safety

[1] *See* Development of Operational, Technical and Spectrum Requirements for Meeting Federal State and Local Public Safety Communication Requirements Through the Year 2010, WT Docket No. 96-86, *Seventh Report and Order and Notice of Proposed Rulemaking*, 28 FCC Rcd 4783 (2013) (*Seventh Report and Order* and *NPRM*). For information on previous recent amendments to the 700 MHz rules, *see Seventh Report and Order* and *NPRM*, 28 FCC Rcd at 4785-4788 ¶¶ 3-8.

[2] *Id.* at 4810-4812 ¶¶ 86-91.

Telecommunications Council (NPSTC) proposal to designate certain 700 MHz narrowband channels for low-altitude, low power, air-ground voice communications.[3] Finally, it sought comment on other NPSTC proposals made in an earlier 2008 petition and matters raised on the Commission's own motion.[4]

3. In this Report and Order, we:

- Eliminate the December 31, 2016 narrowbanding deadline for 700 MHz public safety narrowband licensees to transition from 12.5 kilohertz to 6.25 kilohertz channel bandwidth technology.[5]
- Redesignate channels in the 700 MHz band that are currently licensed for secondary trunking operations for public safety aircraft voice operations, consistent with NPSTC's 2010 proposal.
- Decline to establish a Nationwide Interoperability Travel Channel.
- Allow voice operations on Data Interoperability Channels on a secondary basis.
- Reallocate the Reserve Channels to General Use Channels and afford T-Band public safety licensees priority for licensing of the former Reserve Channels in T-Band areas.
- Decline to increase the permissible 2 watt ERP for radios operating on the mobile-only low power channels.
- Encourage manufacturers of 700 MHz public safety radios to obtain Compliance Assessment Program (CAP) certification for new equipment to demonstrate that the equipment meets P25 interoperability standards as required by Section 90.548 of the Commission's rules. CAP certification will presumptively establish compliance with Section 90.528; manufacturers that elect not to obtain CAP certification must disclose their basis for asserting compliance.
- Encourage Public Safety Licensees to incorporate CAP into their solicitations for supporting equipment.
- Adopt rules governing the spectral output of signal boosters when simultaneously retransmitting multiple signals.
- Adopt Effective Radiated Power (ERP) as a regulatory parameter in this band, in place of Transmitter Power Output (TPO).
- Recommend, but do not require, that 700 MHz radios operating on interoperability calling channels employ the Project 25 Network Access Code (NAC) $293. Clarify that 700 MHz radios must be capable of being programmed to any of the 64 interoperability channels, but that all interoperability channels do not have to be accessible to the radio's user.
- Clarify that the rules do not allow analog operation on the 700 MHz interoperability channels.

[3] *Id.* at 4815-4816 ¶¶ 98-102.

[4] *Id.* at 4821 ¶¶ 118-120.

[5] As a result of our decision to eliminate the 700 MHz narrowbanding deadline, we dismiss as moot several requests for waiver filed prior to and during the pendency of this rulemaking.

II. DECEMBER 31, 2016 DEADLINE FOR TRANSITION TO NARROWBAND 6.25 KILOHERTZ TECHNOLOGY

A. Background

4. In 2002 the Commission adopted narrowbanding rules requiring 700 MHz public safety narrowband licensees to migrate from a 12.5 kilohertz voice efficiency standard to a 6.25 kilohertz voice efficiency standard by December 31, 2016.[6] The Commission adopted the December 2016 deadline based on its assessment, at the time, of the future availability of 6.25 kilohertz-capable equipment and the reasonable useful life of 12.5 kilohertz equipment in use by incumbent licensees.[7] The Commission also established December 31, 2014, as an interim deadline for manufacturers to cease marketing, manufacturing, or importing 700 MHz narrowband equipment not capable of operating at 6.25 kilohertz efficiency.[8] This interim date also marks the deadline after which the Commission will no longer accept applications for new 12.5 kilohertz bandwidth systems in the 700 MHz band.[9]

5. The *NPRM* sought comment on whether to extend the December 31, 2016 deadline and, if the Commission chose to extend the deadline, by how long.[10] The Commission similarly sought comment on whether to extend the interim December 31, 2014 deadline.[11] The Commission asked commenters to update the record on the availability of 6.25 kilohertz equipment that is fully tested and ready for deployment in the 700 MHz band. The Commission asked whether factors aside from the commercial availability of narrowband-capable equipment might have caused licensees to continue purchasing and deploying 12.5 kilohertz equipment.[12]

6. The *NPRM* also sought comment on whether, in lieu of extending the narrowbanding deadline, the Commission should eliminate the deadline entirely and no longer require 6.25 kilohertz narrowbanding in the 700 MHz narrowband spectrum.[13] The *NPRM* noted the possibility that broadband technology eventually could evolve to support the mission-critical voice services that narrowband systems currently provide and asked whether this would spur greater demand for conversion of 700 MHz narrowband spectrum to broadband use.[14] It also noted that in 2012 Congress expressly granted the Commission discretion to allow the 700 MHz narrowband spectrum "to be used in a flexible manner, including usage for public safety broadband communications."[15] The Commission further asked whether the spectral efficiency benefits of narrowbanding could be "outweighed by the potential inefficiency of requiring public safety agencies to devote resources in this band to a technological path that may not meet their long-term needs."[16]

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[6] 47 C.F.R. § 90.535(d)(2).

[7] *See* Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, *Fifth Report and Order,* 17 FCC Rcd 14999, 15004-05 ¶ 11, 15007 ¶ 16 & n.54 (2002) (*Fifth Report and Order*).

[8] 47 C.F.R. §§ 90.203(m)-(n).

[9] 47 C.F.R. § 90.535(d)(1).

[10] *NPRM,* 28 FCC Rcd at 4810-4811 ¶¶ 86, 88.

[11] *Id.* at ¶ 86.

[12] *Id.* at ¶ 87.

[13] *Id.* at ¶ 91.

[14] *Id.* at ¶ 90.

[15] *NPRM,* 28 FCC Rcd at 4812 ¶ 90, *citing* Middle Class Tax Relief and Job Creation Act of 2012, § 6102, Pub. L. No. 112-96, 126 Stat. 156 (2012) (Public Safety Spectrum Act), codified at 47 U.S.C. § 1412.

[16] *Id.* at ¶ 91.

7. Commenting parties almost universally support either extending[17] or eliminating[18] the December 31, 2016 deadline. Many claim that meeting the deadline would impose a financial hardship.[19] Some state they have recently implemented 12.5 kilohertz systems, in light of the extension of the digital television (DTV) transition until June 2009 and the delayed availability of equipment, and that transitioning by the December 2016 deadline would render those systems "legally obsolete" well before the end of their normal life cycle notwithstanding substantial expenditure on them.[20] Others argue that the current deadline could force parties to replace their equipment before FirstNet's broadband network is available to provide mission-critical voice capability.[21] Some parties also dispute the Commission's assumption of a ten-year life cycle for land-mobile equipment, claiming that a more realistic life-cycle is 15 to 20 years.[22] NPSTC and NRPC argue that the narrowbanding deadline should be eliminated and decisions regarding whether to adopt more efficient technologies should be left to the regional planning process based on the specific spectrum needs and conditions of each particular region.[23]

8. Many commenters also express reservations about the current maturity of 6.25 kilohertz

[17] Comments filed in support of extending the deadline included: Comments of the City of College Station, PS Docket No. 13-87 (filed June 7, 2013) (College Station Comments) at 1; Comments of Steve Sciotto, PS Docket No. 13-87 (filed June 18, 2013) (Steve Sciotto Comments) at 3; Comments of the Region 6 (Northern California) Regional Planning Committee Concerning the Seventh Report and Order Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 18, 2013) (Region 6 Comments) at 2; and Comments of the State of Maryland, PS Docket No. 13-87 (filed June 18, 2013) (Maryland Comments) at 4.

[18] Comments filed in support of eliminating the deadline included: Comments of the National Public Safety Telecommunications Council, PS Docket No. 13-87 (filed June 18, 2013) (NPSTC Comments) at 4; Comments of the City of New York, PS Docket No. 13-87 (filed June 18, 2013) (City of New York Comments) at 2; Comments of Public Safety Region 28 Regional Planning Committee, PS Docket No. 13-87 (filed June 18, 2013) (Region 28 Comments) at 1; and Comments of the National Regional Planning Council, PS Docket No. 13-87 (filed June 18, 2013) (NRPC Comments) at 15.

[19] College Station Comments at 1; Region 28 Comments at 1; Michigan Public Safety Frequency Advisory Committee- Region 21, PS Docket No. 13-87 (filed June 17, 2013) (Region 21 Comments) at 1; Comments of the City of Savannah and the Southeast Georgia Regional Radio Network), PS Docket No. 13-87 (filed June 17, 2013) (SEGARRN Comments) at 4; Comments of the State of Illinois No. 13-87 (filed June 10, 2013) (State of Illinois Comments) at 25; Comments of the Regional Wireless Cooperative- Arizona, PS Docket No. 13-87 (filed June 14, 2013) (Regional Wireless Cooperative Comments) at 5; Comments of the Region 49 (Central Texas) Regional Planning Committee, PS Docket No. 13-87 (filed June 13, 2013) (Region 49 Comments) at 1; Comments of Washington County, Texas, PS Docket No. 13-87 (filed June 11, 2013) (Washington County TX Comments) at 1; Comments by Patrick Roland of the Tennessee Valley Regional Communications System, PS Docket 13-87 (filed on June 7, 2013) (Comments of the Tennessee Valley Regional Communications System) at 1; Comments by David G. Gates of the Pocatello Fire Department & District Interoperability Governance Board 5(DIGB 5), PS Docket No. 13-87 (filed April 23, 2013) (Comments of Pocatello DIGB 5) at 1; City of Ammon Comments, PS Docket No. 13-87 (filed April 23, 2013) (Comments of City of Ammon) at 1; Comments of Ada County Paramedics, PS Docket No. 13-87 (filed April 23, 2013) (Comments of Ada County) at 1.

[20] Comments of the City of Bryan, Texas, PS Docket No. 13-87 (filed June 18, 2013) (City of Bryan Comments) at 1-2. *See also* Comments of the Association of Public-Safety Communications Officials-International, Inc., PS Docket 13-87 (filed June 18, 2013) (APCO Comments) at 2; Comments of the California Public-Safety Radio Association, PS Docket No. 13-87 (filed June 17, 2013) (CPRA Comments) at 2; Comments of the Ohio Statewide Interoperability Executive Committee, PS Docket No, 13-87 (filed June 14, 2013) (Ohio SIEC Comments) at 3.

[21] APCO Comments at 2-3, Washington County, Texas Comments at 1.

[22] Comments of Camden County- Georgia Concerning Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 7, 2013)(Comments of Camden County) at 1; Virginia Comments, at 3; Washington County, Texas Comments at 2; BVWACS Comments at 2; Regional Wireless Cooperative Comments at 4; SEGARRN Comments at 2-3; City of Bryan Comments at 2.

[23] NPSTC Comments at 4; NRPC Comments at 15.

technology, pointing out that there is no open standard for 6.25 kilohertz unit-to-unit (talk around) communications, vehicular repeaters, or 6.25 kilohertz frequency division multiple access (FDMA) non-trunked communications.[24] Some commenters argue on this basis that the Commission should delay or eliminate the December 2014 equipment manufacturing deadline.[25] Some parties recommend various dates in the future;[26] others propose that the equipment manufacturing deadline be made coincident with the implementation deadline.[27] A few commenters support retaining the current deadline and providing relief as needed on a waiver basis, similar to the approach the Commission took in implementing the recent UHF/VHF narrowbanding deadline.[28]

B. Discussion

9. We conclude that the December 31, 2016 narrowbanding implementation deadline is no longer viable. The record indicates that requiring narrowbanding by December 2016 would force many licensees to modify or replace existing systems well before the end of their useful life.[29] In addition, we share the concerns expressed by many commenting parties about the maturity of 6.25 kilohertz-capable equipment, including the lack of developed open standards governing major system components.[30]

10. We further conclude that rather than extending the deadline to a subsequent date, the better course is to eliminate the narrowbanding requirement altogether. We agree with NPSTC and NRPC that spectrum requirements in the 700 MHz band may vary significantly from region to region, and that assessing these requirements is best left to the Regional Planning Committees (RPCs) that have been tasked with developing regionally specific plans for use of the band. Imposing a national narrowbanding deadline – even with an extended timeline – would limit the flexibility of the RPCs to develop spectrum plans that are optimized to regional needs and could a create risk of stranded investment.

11. Our decision not to require further narrowbanding does not preclude voluntary migration

[24] Reply Comments of Motorola Solutions, PS Docket No. 13-87 (filed June 18, 2013) (Motorola Reply Comments) at 3; Reply Comments of ICOM America, PS Docket No. 13-87 (filed July 18, 2013) (ICOM Reply Comments) at 3, Virginia Comments at 1-3, Reply Comments of the Commonwealth of Virginia, PS Docket No, 13-87 (filed July 11, 2013) (Virginia Reply Comments) at 1-4; Maryland Comments at 18; Comments of E.F. Johnson Technologies, Inc., PS Docket 13-87 (filed June 17, 2013) (E.F. Johnson Comments) at 2 (delays in technology development make practical implementation by 2016 untenable; common air interface standard was not finalized until December 2010); Regional Wireless Cooperative Comments at 4; Weld County Comments at 5-6; Comments of Adams County Communications Center Concerning the Seventh Report and Order Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 7, 2013) (Comments of Adcom911) at 3; Comments of Tony Hafla, PS Docket No. 13-87 (filed April 23, 2013) (Comments of Tony Hafla) at 33. *But see* Comments of Harris Corporation, PS Docket No. 13-87 (filed June 18, 2013) (Harris Comments) at 7-8 (no lack of 6.25 kilohertz technology or standards justify delaying the deadline; the technology exists and TIA has published the necessary standards).

[25] ICOM Reply Comments at 3; Commonwealth of Virginia Reply Comments at 5.

[26] Motorola advocates a one-year delay. Comments of Motorola Solutions, PS Docket No. 13-87 (filed June 18, 2013) (Motorola Comments) at 4, Motorola Reply Comments at 2. E. F. Johnson believes the date should be 2024. E. F. Johnson Comments at 3.

[27] NPSTC and the Regional Wireless Cooperative believe the Commission should make the deadline 1-2 years ahead of any implementation deadline. NPSTC Reply Comments at 5; Regional Wireless Cooperative Comments at 5. Savannah argues that the deadline should be 10-15 years ahead of implementation. SEGARRN Comments at 4.

[28] Harris Comments at 7; Comments of the Arkansas Interoperable Communications Committee Concerning the Seventh Report and Order Notice of Proposed Rulemaking, PS Docket No, 13-87 (filed June 14, 2013) (AICC Comments) at 4; Comments by the Region 7 (Colorado) Regional Planning Committee Concerning the Seventh Report and Order Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 13, 2013) (Region 7 Comments) at 3-4.

[29] *See* n. 22, *supra.*

[30] *See* n. 24, *supra.*

to 6.25 kilohertz technology. To the contrary, we recognize that some licensees have already narrowbanded, and we encourage RPCs in areas where channel capacity is at a premium to investigate the benefits of 6.25 kilohertz efficiency. At the same time, eliminating the narrowbanding requirement also allows RPCs to consider other options for optimizing use of the spectrum, including the possibility of future broadband use. Although no RPC has proposed such use at this point, the incentives to develop broadband applications in this band could change over time, particularly as FirstNet builds out the nationwide public safety broadband network in the adjacent spectrum band, and as LTE progresses towards development of mission-critical voice capability. We encourage the RPCs to monitor the development of trends in broadband technology that could support proposals for flexible use of the 700 MHz narrowband spectrum, and we encourage RPCs to submit such proposals for our consideration.

12. Finally, having decided to eliminate the December 31, 2016 deadline, there is also no reason to retain the December 31, 2014 interim deadline for the cessation of marketing, manufacture, or import of 700 MHz narrowband equipment not capable of operating at 6.25 kilohertz efficiency, given that the interim deadline is designed to function as a step for facilitating and otherwise motivating progress toward the final deadline. We therefore eliminate the interim deadline as well.

III. AIR-GROUND COMMUNICATIONS ON SECONDARY TRUNKING CHANNELS

A. Background

13. The *NPRM* sought further comment on NPSTC's proposal to redesignate the 700 MHz secondary trunking channels for low-altitude (457 meters/1500 feet), low-power (2 watt ERP), air-ground voice communication.[31] The secondary trunking channels are sixteen 6.25 kilohertz channel pairs, each immediately adjacent to one of the corresponding 6.25 kilohertz interoperability channel pairs.[32] The Commission intended to allow the interoperability and trunking channel pairs to be aggregated to form 25 kilohertz bandwidth channels,[33] which could be used for trunking operations on a secondary basis when the interoperability channels were not needed for interoperability purposes.[34] The current rules do not allow the secondary trunking channels to be used for any other purpose.[35]

14. The *NPRM* noted that the State of Maryland and other commenters on the NPSTC petition had expressed strong interest in using secondary trunking channels to integrate air-ground communication into their 700 MHz narrowband systems.[36] The *NPRM* asked whether the secondary trunking channels were the most appropriate channels for this purpose, whether airborne use could pose any interference risk to terrestrial users on either the trunking channels or adjacent channels, and how to

[31] *NPRM*, 28 FCC Rcd at 4812-16 ¶¶ 92-102. *See* Petition for Rulemaking of the National Public Safety Telecommunications Council, RM 11433 (filed Mar. 19, 2010) (NPSTC Air-to-Ground Petition). The Public Safety and Homeland Security Bureau had previously sought and received comments on NPSTC's petition. *See NPRM,* 28 FCC Rcd at 4814-15 ¶¶ 96-97.

[32] 47 C.F.R. § 90.531(b)(7). The channel pairs reserved for secondary trunking are: 21/981, 22/982, 101/1061, 102/1062, 181/1141, 182/1142, 261/1221, 262/1222, 659/1619, 660/1620, 739/1699, 740/1700, 819/1779, 820/1780, 899/1859, and 900/1860.

[33] A 25 kilohertz bandwidth channel is formed by combining two contiguous 6.25 kilohertz secondary trunking channels with the two adjacent 6.25 kilohertz interoperability channels.

[34] 47 C.F.R. § 90.537(b).

[35] 47 C.F.R. § 90.531(b)(7) (channels "reserved" for secondary trunking operations).

[36] *NPRM*, 28 FCC Rcd at 4815 ¶ 98. As noted in the *NPRM*, the Public Safety and Homeland Security Bureau granted a waiver to Maryland allowing it to use the secondary trunking channels for air-ground communications, subject to the outcome of this proceeding. State of Maryland Request for Waiver of 47 CFR §90.531(b)(7) to Permit Operation of Air-to-Ground Radio Equipment on 700 MHz Secondary Trunking Channels, *Order*, 27 FCC Rcd 10065 (PSHSB 2012) (*Air-to-Ground Order*).

coordinate airborne use with geographically adjacent jurisdictions.[37]

15. Most commenters support low-altitude air-ground operations in the 700 MHz band[38] and agree that lack of terrestrial use of the secondary trunking channels makes them particularly suitable for air-ground use.[39] Maryland asserts that the need for secondary trunking channels has been eliminated by the Project 25 (P25) standard for interoperability channels, and thus that this is "fallow spectrum."[40] Region 49 states it is unaware of any current use of the secondary trunking channels and foresees no "interference potential resulting from airborne low-power use."[41]

16. Region 21 argues that 700 MHz air-ground communications should not be limited to the secondary trunking channels, contending that local agencies or regions should have flexibility to use any licensed frequency that suits their needs.[42] Region 21 states that it has allocated state-use channels for aircraft to communicate "reliably and seamlessly" with ground units."[43] This, Region 21 claims, offers the "best possible solution for both routine and disaster air to ground communications" because it "avoids complications and inherent errors of relaying or patching communications from separate aircraft-only frequencies."[44]

17. Most parties support limiting air-ground transmissions on the secondary trunking channels to two watts ERP, as proposed by NPSTC.[45] Motorola states that a two-watt ERP limit will "enable robust communications while also limiting the potential for adjacent channel interference."[46] Maryland concurs, finding two watts ERP an "appropriate power setting" based upon initial testing of its air-ground system.[47] Region 21, however, proposes a ten watt power limit, which is the limit under the general rule allowing airborne transmissions on Part 90 private land mobile frequencies.[48] Florida is concerned that the two watt ERP limit would "limit operations specifically to the vicinity of the scene of the incident similar to how talk-around or 'Direct' mode already does."[49]

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[37] *NPRM*, 28 FCC Rcd at 4815-16 ¶¶ 98-102.

[38] Region 6 Comments at 2; Comments of the National Regional Planning Council to the Commission's Seventh Report and Order and Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 18, 2013) (NRPC Comments) at 7-8; Motorola Comments at 4-6; Comments of the State of Florida to the Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 18, 2013) (Florida Comments) at 2-3; NPSTC Comments at 4-5; Maryland Comments at 8-16; APCO Comments at 3; Ohio SIEC Comments at 7-9; Region 49 Comments at 2; ICOM Reply Comments at 4; Reply Comments of the State of Maryland, PS Docket No. 13-87 (filed July 18, 2013) (Maryland Reply Comments) at 4-11.

[39] Region 6 Comments at 2; NRPC Comments at 7; Florida Comments at 2-3; NPSTC Comments at 5; APCO Comments at 3; Region 49 Comments at 2; ICOM Reply Comments at 2; Maryland Reply Comments at 4-5.

[40] Maryland Reply Comments at 4-5. We note that the Project 25, Phase I standard employs 12.5 kHz channels. *Id.*

[41] Region 49 Comments at 2.

[42] Region 21 Comments at 2

[43] *Id.* at 3.

[44] *Id.*

[45] Motorola Comments at 5-6; NPSTC Comments at 5; Maryland Comments at 8; Maryland Reply Comments at 10.

[46] Motorola Comments at 6.

[47] Maryland Reply Comments at 7, 10. The Public Safety and Homeland Security Bureau has granted Maryland a waiver for air-ground communications on the secondary trunked channels. *See Air-to-Ground Order*, 27 FCC Rcd 10065.

[48] *Id.* Part 90 licensees are permitted to operate transmitters with an output power of as much as 10 watts aboard aircraft. Such operations are secondary to land-based systems. *See* 47 C.F.R. § 90.423(a).

[49] Florida Comments at 3.

B. Discussion

18. We redesignate the 700 MHz secondary trunking channels and reserve them for air-ground communication between low-altitude aircraft and associated ground stations, *e.g.*, between medevac helicopters and first responders. We agree with NPSTC and commenting parties that there is a need to designate specific channels in the band for air-ground use.[50] The secondary trunking channels are the most suitable available channels for air-ground communication because they are not used for their originally intended purpose*, i.e.,* aggregation with the adjacent interoperability channels to form 25 kilohertz bandwidth channels for trunking.[51] Because these channels are clear of incumbents, there is little risk of co-channel interference.

19. We adopt the proposed two watt ERP limit and restrict airborne use to altitudes at or below 457 meters (1500 feet) above ground level, in order to limit the geographic area impacted by aeronautical transmissions. Although some commenters advocate a higher limit, Maryland's testing reveals that aircraft operating at approximately 1400 feet above ground level with 2 watts ERP can communicate adequately, even with distant base stations, and are able to do so without causing interference to other licensees.[52] We assign responsibility for coordinating these channels to the states and permit aircraft to use either the mobile transmit or base transmit side of the channel pair.[53]

20. We note that our agreements with Canada and Mexico for the 700 MHz band cover only terrestrial land mobile operations along the border; neither agreement contemplates airborne operations.[54] Therefore, we will consider applications for air-ground use of the secondary trunking channels within 315 kilometers of the Canada or Mexico border on a case-by-case basis.[55] We advise applicants for such channels in the border areas to specify channels on U.S. primary spectrum whenever possible. Should any future coordination zones or international procedures affecting the 700 MHz band be agreed to and memorialized in international agreements with Canada and Mexico, the Chief, Public Safety and Homeland Security Bureau, may codify such changes in the Commission's rules pursuant to the Bureau's pre-existing delegated authority under Section 0.392(e) of the Commission's rules[56] to the extent that "novel questions of fact, law or policy"[57] are not involved.

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[50] NPSTC Comments at 4-5; Motorola Comments at 4-5; Maryland Comments at ii; Region 6 Comments at 2; NRPC Comments at 7; APCO Comments at 3; ICOM Reply Comments at 4; Maryland Reply Comments at ii.

[51] A nationwide search of the Commission's ULS database revealed only one licensee operating in a 25 kilohertz mode on any of the secondary trunking channels.

[52] Maryland Reply Comments at 7-10.

[53] *See* 47 C.F.R. § 90.531(a). Because the states are responsible for administration of the adjacent interoperability channels, they are in the best position to manage operations on the newly designated air-ground channels. Nonetheless, we encourage the states to coordinate operations on the newly designated air-ground channels with regional planning committees.

[54] *See* Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 768-776 MHz and 798-806 MHz by the Land Mobile Service Along the Canada-United States Border (May 2013) (Arrangement Q); Protocol Between the Department of State of the United States of America and the Secretariat of Communications and Transportation of the United Mexican States Concerning the Allotment and Use of the 698-806 MHz Band for Terrestrial Non-Broadcasting Radiocommunication Services Along the Common Border (Nov 2006) (700 MHz Mexico Protocol).

[55] The 315 km distance is based on "worst case" radio line of sight from an aircraft at an altitude of 457 meters AGL to a typical base station antenna elevation on the other side of the borders, assuming certain median terrain levels above mean sea level for both the aircraft's location and the base station's location.

[56] 47 C.F.R. § 0.392(e).

[57] *Id.*

21. Our creation of designated air-ground channels does not affect the general Part 90 rule allowing secondary airborne transmissions (at up to 10 watts) so long as they do not interfere with other licensees' ground-based operations.[58] Nonetheless, as the 700 MHz band becomes more congested, we believe it will become increasingly difficult to use 700 MHz channels other than secondary trunking channels for airborne communications without interfering with terrestrial facilities. Therefore, we encourage any licensee planning airborne use of 700 MHz channels to consider the newly designated air-ground channels as a first option.[59]

IV. 2008 NPSTC PETITION – PROPOSED REVISIONS TO 700 MHZ NARROWBAND CHANNEL PLAN

A. Nationwide Interoperability Travel Channel

1. Background

22. Section 90.531(b)(1)(ii) of the Commission's rules establishes four 6.25 kilohertz channel pairs (channels 39/999, 40/1000, 681/1641, and 682/1642) as nationwide calling interoperability channels.[60] The *NPRM* sought comment on NPSTC's proposal to redesignate the two upper channel pairs as "Nationwide Interoperability Travel Channels," with the lower pairs being retained for nationwide calling.[61] NPSTC contends that nationwide interoperability travel channels would facilitate coordination of vehicle convoys transporting resources, assets, and personnel to major incidents, thereby allowing "first responders and equipment to be deployed to an area directly instead of having to first travel to a staging area."[62]

23. A number of commenters support the NPSTC proposal.[63] MCP contends that the NPSTC proposal merely codifies current practice, *i.e.,* that users already employ the calling channels while travelling to an incident.[64] The Association of Public-Safety Communications Officials (APCO), however, argues that, since the 700 MHz narrowband allocation has been combined, having two sets of calling channels may lead to confusion as to which channel to use in a given area.[65] Region 6 supports the NPSTC proposal and notes that California's fire response service has been using a statewide VHF channel as a travel channel for years with great success.[66]

24. NPSTC submits that establishing a travel channel would not adversely affect cross border

[58] *See* Region 21 Comments at 2-3 (noting that Region 21 is selecting channels licensed for statewide operation for air-ground voice communications). *See also* 47 C.F.R. § 90.423(a)(3).

[59] *Id.*

[60] 47 C.F.R. § 90.531(b)(1)(ii). Licensees may generally combine adjacent channel pairs for wider bandwidth operation, resulting in two 12.5 kilohertz bandwidth channel pairs reserved for nationwide calling. *See* 47 C.F.R. § 90.531(d).

[61] *NPRM*, 28 FCC Rcd at 4817 ¶ 107. *See* 2008 NPSTC Petition at 6.

[62] 2008 NPSTC Petition at 6.

[63] Adcom911 Comments at 4; APCO Comments at 4; NPSTC Comments at 7; NRPC Comments at 10; Comments of Mission Critical Partners, PS Docket No. 13-87 (filed June 18, 2013) (MCP Comments) at 5; Region 6 Comments at 3; Region 7 Comments at 4; Comments of the National Regional Planning Council to the Commission's Seventh Report and Order and Notice of Proposed Rulemaking, PS Docket No. 13-87 (filed June 18, 2013) (Region 54 Comments) at 9; ICOM Reply Comments at 4-5; and Reply Comments of the New York State Division of Homeland Security and Emergency Services, PS Docket No. 13-87 (July 16, 2013) (New York Comments) at 2.

[64] MCP Comments at 5.

[65] APCO Comments at 4.

[66] Region 6 Comments at 3.

communications with Canada, but APCO notes that use of the travel channel for convoys must comply with relevant treaties.[67] Similarly, NRPC states that "[t]he retention of this international capability [*i.e.* cross-border calling channels] would be predicated on the state administering the 700 MHz channels along the Canadian border ensuring that the new travel channel designation and protocol were shared with Canadian authorities by distributing the 700 MHz Interoperability Plan for their respective state."[68]

25. Maryland supports the travel channel proposal, but asks that the scope of permissible use be clarified to allow "broad based communications" when a user is out of state, but conducting official business."[69] Florida generally agrees with NPSTC's proposal but suggests several variations and limitations.[70] Adcom911 and Region 7 argue that the designated travel channel should remain available for use as a secondary command and control channel for incident commanders.[71]

26. Region 21 opposes the NPSTC travel channel proposal,[72] arguing that the travel channel would result in a mere "duplication of functionality" currently ascribed to the calling channels and that any "confusion" could be avoided by referring to the relevant regional plans.[73] Additionally, Region 21 argues that a travel channel could adversely affect the role of Incident Commanders and notes that a second or third calling channel would be of "inestimable value" in the event that more than one large incident occurred simultaneously.[74] Region 21 suggests that the 700 MHz Regional Planning Committees (RPCs) be allowed to designate a nationwide calling channel as a "regional" travel channel.[75]

27. In its reply, NPSTC states that the proposed travel channel will support both the coordination of resources while en route and the direction of resources upon arrival to the incident scene.[76] NPSTC contends that some uses of its proposed travel channel would not be permissible uses of the calling channels.[77] NPSTC also submits that Florida's proposed restrictions would preclude several of

[67] APCO Comments at 4; NPSTC Comments at 8.

[68] NRPC Comments at 10-11.

[69] Maryland Comments at 16. Additionally, Maryland advocates "that the channel's permitted uses should be expanded on a secondary basis and with certain administrative restrictions to support official law enforcement activities occurring out of State." Maryland Comments at 17-18; Maryland Reply Comments at 11-12.

[70] Florida Comments at 4. For example, Florida proposes (1) that this new channel should not be referred to as a calling channel; (2) "Talk-around or "Direct" should be allowed on the repeater output of the channel pair between mobile users"; (3) FB2T should also be allowed on a nationwide basis for mobile repeater systems; (3) the travel channel should not undermine the need for using the resulting one 700 MHz "Calling Channel" for local agency contact upon arrival in the incident area or in transit"; and (4) FB2 should be prohibited to avoid "'co-channel chaos' when two or more co-channel users operate on the same interoperability channel in the same area without cooperative use." Florida Comments at 4.

[71] Adcom911 Comments at 4; Region 7 Comments at 4.

[72] Region 21 Comments at 4-6.

[73] *Id.* at 4-5.

[74] *Id*. at 6.

[75] *Id.*

[76] NPSTC Reply Comments at 8. NPSTC clarifies that its proposed uses include: (1) simplex communication for coordination between responding personnel and/or vehicles making up a Strike Team, Task Force, or other group with responding resources; (2) contact with a local agency for assistance or support (directions, equipment repair to a vehicle breakdown, etc.); (3) contact with incident command and/or Resource Unit while still some distance away for cancellation or redirection to a different and/or change of Staging Area location; and (4) collection of responder information or follow-on questions. NPSTC Reply Comments at 8-9.

[77] *Id*. at 9.

the major uses proposed for this channel pair such as wide-area communications.[78] Addressing Maryland's proposal, NPSTC submits that, with no restriction on licensed area of operation for mobile and portable units, the law enforcement use Maryland proposes is already permissible on any of the nationwide interoperability channels, except the Calling Channels, or on any of the nationwide Itinerant Channels.[79]

2. Discussion

28. We decline to establish nationwide interoperability travel channels. We agree with MCP and Region 21 that the existing calling channels provide the travel-related functionality that NPSTC proposes. For example, the calling channels enable public safety entities en route to an emergency to communicate with local emergency responders already at the scene of an incident and to switch to another interoperability channel if indicated. The Commission envisioned the calling channels as "gateways" to other channels,[80] noting that "[p]ublic safety entities, particularly those from 'outside the system,' would use calling channels to access the public safety communications infrastructure in the area where they are located."[81] Thus, the rules already permit first responders travelling to an emergency to communicate with first responders at the scene of such an emergency and to coordinate disaster response transportation activities.[82] The Commission encourages the States and RPCs to work with FEMA and other Federal agencies to establish clear "joining" procedures as Federal responders join incident response teams.

29. NPSTC's proposal also could impair communications in major emergencies because it would reduce the number of 12.5 kilohertz 700 MHz channel pairs devoted to nationwide calling interoperability from two to one pair.[83] The interoperability requirements of Federal, regional, state, and local jurisdictions simultaneously responding to a mass casualty event could easily inundate a single calling channel. Additionally, a single calling channel pair may be inadequate when there are simultaneous emergencies in different locations.

30. Repurposing the upper calling channel pair would also reduce the number of channels for cross-border calling interoperability with Canada.[84] We note that Congress has sought to expand international interoperability through the Border Interoperability Demonstration Project.[85] We conclude,

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[78] *Id*.

[79] *Id.* at 11.

[80] *See* Development of Operational, Technical and Spectrum Requirements for Meeting Federal State and Local Public Safety Communication Requirements Through the Year 2010, WT Docket No. 96-86, *Fourth Report and Order and Fifth Notice of Proposed Rulemaking*, 16 FCC Rcd 2020, 2042 ¶ 65 (2001).

[81] *Id.* at 2042-2043 ¶ 65. Travel functions, such as Maryland describes (*e.g.* conducting "official business" out of state), can be accommodated on any of the other thirty two interoperability channel pairs on an ad hoc basis.

[82] MCP Comments at 5; Region 21 Comments at 4-6.

[83] *See NPRM,* 28 FCC Rcd at 4817-18 ¶ 107 (overload of 800 MHz band mutual aid channels during Hurricane Katrina).

[84] Canada and the U.S. have designated the channel pairs identified by NPSTC for cross-border calling interoperability within the border region. Sharing Arrangement Between the Dept. of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 764 to 776 MHz and 794 to 806 MHz by the Land Mobile Service Along the Canada-United States Border (June 2005) at ¶ 3.2.3(a) (Arrangement G). This document is available on the Commission's web site at http://www.fcc.gov/ib/sand/agree/files/can-nb/764_806.pdf. Note, however, that Arrangement G is based upon the pre-consolidation band plan. The United States and Canada are currently working on a replacement arrangement which will maintain the sharing principles detailed in Arrangement G but reflect the current U.S. domestic channel plan.

[85] 6 U.S.C. § 580. Congress authorized the Department of Homeland Security's Office of Emergency Communications to establish the Border Interoperability Demonstration Project (BIDP), a competitive grant

(continued….)

therefore, that maintaining the current calling channels will better facilitate interoperable communications among all first responders responding to threats and natural disasters along the border.

B. Voice Communications on Data Interoperability Channels

1. Background

31. The Commission's rules reserve four 6.25 kilohertz channel pairs for data-only interoperability.[86] The *NPRM* sought comment on NPSTC's proposal to allow voice communications on a secondary basis on the upper two of these channel pairs to meet an expanding demand for channels.[87] NPSTC argues that this "promote[s] more effective and extensive use of the channels while preserving their prime purpose when required for data use."[88]

32. Commenters generally support voice on a secondary basis on the upper data-only interoperability channels[89] and do not anticipate this would adversely affect data communications.[90] NPSTC and APCO recommend deleting section 90.531(b)(1)(i) of the rules and allowing all channels currently designated for data interoperability to also be available for primary use as voice interoperability channels.[91]

2. Discussion

33. The record does not reflect a large demand for dedicated data interoperability channels. No commenter suggests that secondary voice use would have an adverse impact on existing public safety systems. We conclude it is preferable to allow secondary use of these channels for voice operations instead of allowing them to lie fallow. However, we decline to remove the data-only designation or to designate the channels for primary voice use as NPSTC and APCO suggest. Although demand for data interoperability channels is limited at present, it could increase in the future. Our approach will allow public safety immediate access to these channels for voice use but also preserve them for future data use. As Region 21 notes, secondary voice use need not affect primary data operations in the international border areas or elsewhere within the region.[92]

C. Reserve Channels

1. Background

34. Section 90.531(b)(2) of the Commission's rules reserves twenty-four 12.5 kilohertz bandwidth channel pairs for future designation (Reserve Channels).[93] The Commission held these

(Continued from previous page)
program focused on developing innovative solutions to improve emergency communications in communities on the U.S.-Canadian and the U.S.-Mexican borders.

[86] 47 C.F.R. § 90.531(b)(1)(i) (reserving channel pairs 279/1239, 280/1240, 921/1881, and 922/1882.

[87] *NPRM*, 28 FCC Rcd at 4818 ¶ 110. *See* 2008 NPSTC Petition at 7. We note that NPSTC sought comment on the use of these channels for "tactical voice communications" but since our rules do not have a definition for what constitutes "tactical" we broaden the scope of the rule change to voice use generally.

[88] *Id*.

[89] ICOM Reply Comments at 5; Maryland Reply Comments at 12; Region 6 Comments at 3; Region 21 Comments at 6.

[90] Florida Comments at 4 (Florida does not believe that primary voice communications on the proposed channel would upset the channel naming convention per APCO/NPSTC ANS 1.104.1-2010); Region 7 Comments at 4.

[91] NPSTC Comments at 8; APCO Comments at 4.

[92] Region 21 Comments at 6.

[93] 47 C.F.R. § 90.531(b)(2). The 700 MHz channel plan identifies 48 Reserve Channel pairs with 6.25 kilohertz bandwidth, which can be aggregated into 24 12.5 kilohertz channel pairs.

channels in reserve to meet developing needs for 700 MHz spectrum.[94] In its 2010 petition, NPSTC proposed that all of the Reserve Channels be designated for temporary deployable mobile trunked infrastructure that could be transported into an incident area to assist with emergency response and recovery.[95] NPSTC asserted that such designation would allow 700 MHz licensees to pre-program these channels into their subscriber radios, eliminating the need during a disaster to reprogram radios in the field or distribute cached radios.[96]

35. The *NPRM* sought comment on whether to make the Reserve Channels available for temporary use, as proposed by NPSTC, or whether to make some or all of the channels available for permanent use.[97] In the latter regard, the Commission noted that the Los Angeles Regional Interoperable Communications System Joint Powers Authority (LA-RICS) had filed a waiver request for access to the Reserve Channels as part of a proposed "hybrid" system that would operate on both 700 MHz and T-Band channels and would facilitate eventual T-Band migration as required by the Public Safety Spectrum Act.[98] The Commission asked whether opening the Reserve Channels for licensing would facilitate T-Band migration in Los Angeles as well as in other metropolitan markets.[99] The Commission also asked whether the Reserve Channels could help address public safety capacity needs in non-T-Band areas, and whether a percentage of the Reserve Channels should be designated for temporary use and the remainder designated for permanent licensing.[100]

36. Most commenters support making the Reserve Channels available for a combination of uses, including (a) temporary use for deployable mobile trunked infrastructure, as proposed by NPSTC, (b) licensing on a priority basis to T-Band incumbents and (c) licensing to address spectrum shortages in areas not affected by T-Band relocation.[101] In its comments, NPSTC states that it supports a mixed-use approach in which some Reserve Channels would be designated for temporary use and others for permanent operations.[102] NPSTC proposes to designate at least eight 12.5 kilohertz channel pairs for temporary use consistent with its original petition.[103] New York and the NRPC generally concur with NPSTC but also propose that some Reserve Channels be dedicated to vehicular repeaters.[104]

37. LA-RICS and the Washington Metropolitan Area Transit Authority (WMATA) seek access to the Reserve Channels for themselves and other T-Band incumbents to facilitate eventual

[94] *See First Report and Order*, 14 FCC Rcd at 170 ¶ 32.

[95] *See NPRM*, 28 FCC Rcd at 4819-20 ¶¶ 113-116.

[96] 2008 NPSTC Petition at 8.

[97] *NPRM*, 28 FCC Rcd at 4821 ¶¶ 118-120.

[98] *Id.* at ¶ 120. Public Safety Spectrum Act § 6103 requires public safety T-Band incumbents to vacate the T-Band within two years after completion of the auction of this spectrum, which must begin by 2021. 47 U.S.C. § 1422.

[99] *Id*.

[100] *Id.* The *NPRM* noted a proposal by Virginia to designate half the channels for temporary use and make the remainder solely available to State licensees. *Id.*

[101] *See e.g.*, APCO Comments at Region 6 Comments at 3; California Public-Safety Radio Association (CPRA) Comments at 3; NPRC Comments at 11; Region 49 Comments at 2.

[102] NPSTC Comments at 5-6; NPSTC Reply Comments at 11.

[103] NPSTC Reply Comments at 14-15.

[104] New York Comments at 2; NRPC Comments at 11-12. "The operation of assigned vehicular repeater frequencies nationwide could also be dedicated to 700 MHz narrowband Secondary Trunked Spectrum on a nationwide basis." *Id*. As noted *supra*, we reallocate the secondary trunked spectrum to support air-ground communications.

migration from the T-Band.[105] LA-RICS proposes to work with the Region 5 RPC to develop the most effective use of the reserve spectrum in Southern California.[106] WMATA urges the Commission to place the Reserve Channels in the 700 MHz General Use pool under the governance of the RPCs.[107] Other commenters also favor having the RPCs coordinate use of the Reserve Channels, including affording priority access to T-Band incumbents.[108]

38. Some commenters also support using the Reserve Channels to address spectrum shortages in areas not affected by T-Band relocation.[109] Maryland proposes that the Commission allocate a portion of the Reserve Channels to the states in spectrally challenged areas.[110] Maryland further suggests that the FCC publish application criteria for assignment of Reserve Channels.[111]

2. Discussion

39. We conclude that the 700 MHz Reserve Channels should be added to the General Use pool and made available for multiple uses under RPC administration. The demand for 700 MHz narrowband spectrum has significantly increased in recent years, particularly in large urban areas. Some 700 MHz licensees have channel requirements that have surpassed what was envisioned in the original channel allotment process. Moreover, in Los Angeles, Washington DC, and other major metropolitan areas, the Reserve Channels offer much-needed capacity for relocating T-Band public safety licensees as required by the Public Safety Spectrum Act.

40. To accommodate these spectrum demands, we adopt the following overall approach. Rather than dedicating the Reserve Channels exclusively for use with deployable systems, we require the RPCs to administer the Reserve Channels subject to the following. In the non T-Band areas, up to eight 12.5 kilohertz channels may be dedicated for temporary deployable trunked use and the rest for General

[105] Comments of the Los Angeles Regional Interoperable Communications System, PS Docket 13-87 (filed June 18, 2013) (LA-RICS Comments) at 2; Comments of the Washington Metropolitan Area Transit Authority, PS Docket No 13-87 (filed June 18, 2013) (WMATA Comments) at 4. WMATA has also filed a separate waiver request for use of 700-MHz reserved narrowband channels in the region-wide simulcast trunked radio system. Request for Waiver of WMATA, PS Docket No. 13-87 (June 18, 2013); Amended Request for Waiver of WMATA, PS Docket No. 13-87 at 1 (Sept. 23, 2013, corrected Sept. 24, 2013). The WMATA waiver request, as amended, is rendered moot by the relief we provide herein, *i.e.* our designating reserve spectrum to relocating T-Band incumbents.

[106] LA-RICS Comments at 3.

[107] WMATA Comments at 6.

[108] APCO Comments at 5; CPRA Comments at 3-4; Harris Comments at 9-10. Region 28, which covers the Philadelphia T-Band market, and T-Band incumbent Southeastern Pennsylvania Transportation Authority (SEPTA), note that they are "reluctant to simply add the Reserve Channel spectrum to the General Use pool immediately" but instead agree "that the pending transition of T-band users to other bands […] represented a *developing need*." Region 28 Comments at 5 (emphasis in original). Region 28 recommends the Commission give incumbent T-band users priority access to Reserve Channels and that this would be "best implement[ed] … by delegating control of the assignment of Reserve Channel spectrum to the RPC." *Id*.

[109] *See, e.g.*, Region 49 Comments at 2 (Region 49 has "witnessed both 700 MHz and 800 MHz channel shortages in Texas' most urban area[s], and anticipate[s] similar shortages in others.").

[110] Maryland Comments at 22.

[111] Maryland Reply Comments at 13. After the close of the comment period, Maryland filed a waiver request in PS Docket 13-87 to use "a subset" of the Reserve Channels. Petition for Waiver filed by the State of Maryland at ii (filed Dec. 12, 2013). Maryland seeks a waiver to use Reserve Channels to supplement its allotment of state channels, which it contends have been used to their fullest capacity in implementing Maryland's statewide system. *Id*. Maryland states that the existing pool of State and General Use channels has been exhausted in many parts of central Maryland, and that it intends to coordinate its use of the requested reserve channels with WMATA. *Id*. Maryland's waiver request is rendered moot by the relief we provide herein, *i.e.,* allowing the RPCs to make the former Reserve Channels available for General Use to address spectrum shortages outside the T-Band markets**.**

Use, including low-power vehicular repeaters. In the T-Band markets, all twenty-four Reserve Channels will be available for General Use with priority given to relocating T-Band incumbents that commit to return an equal amount of T-Band channels. The RPCs shall submit channel plans consistent with this *Report and Order* within six months from publication in the Federal Register.[112] We encourage T-Band licensees transitioning to the former Reserve Channels to consider using spectrally efficient 6.25 kHz technology given the limited number (24) of available former Reserve Channels.

41. We decline Virginia's proposal to allocate a portion of the Reserve Channels to the States.[113] There is little support in the record for affording the States discretion over the administration of the 700 MHz narrowband reserve spectrum. Indeed, Florida opposes designating reserve spectrum as State Use channels.[114] Overall, commenters support a role for licensees and the RPCs in coordinating the use of the reserve spectrum to meet a variety of needs, including State spectrum needs.

42. Additionally, we decline Maryland's proposal to adopt a needs test as a condition to licensing Reserve Channels.[115] We conclude that the added cost and delay associated with a needs test or requiring T-Band licensees to obtain a Commission waiver is unnecessary given that these Reserve Channels will be subject to RPC administration. We require RPCs, as stewards of this limited spectrum resource, to be diligent to ensure that the reserve spectrum is used efficiently and not simply stockpiled. Accordingly, *infra,* we establish requirements and guidelines to ensure that RPCs appropriately balance the needs of all users and afford T-Band incumbents priority access to the Reserve Channels.

43. *T-Band Markets*. We afford T-Band public safety incumbents priority access to all twenty four 12.5 kilohertz channel pairs for base/mobile networks. Under the Middle Class Tax Relief and Job Creation Act of 2012, public safety incumbents are required to vacate the T-Band in order to facilitate an auction of the spectrum. The priority access we grant today will apply to all of the affected T-Band markets[116] in areas within 128 km (80 miles) from the center coordinates of each market.[117] In addition, where T-Band incumbents have obtained waivers to exceed the 128 km radius,[118] the RPCs shall afford priority access to Reserve Channels in the geographic areas covered by the waiver outside the 128 km radius.[119]

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[112] To facilitate the licensing of the reserve spectrum, we are directing the RPCs to modify their plans to conform to the new narrowband band plan. *See* 47 C.F.R. § 90.527(b) (regional plan modifications).

[113] *NPRM*, 28 FCC Rcd at 4821 ¶ 120.

[114] Florida Comments at 5.

[115] Maryland Comments at 22.

[116] These include Boston, Massachusetts; Chicago, Illinois; Dallas/Fort Worth, Texas; Houston, Texas; Los Angeles, California; Miami, Florida; New York, New York/N.E. New Jersey; Philadelphia, Pennsylvania; Pittsburgh, Pennsylvania; San Francisco/Oakland, California; Washington, District of Columbia/Maryland/Virginia (the Affected T-Band Markets). *See* 47 C.F.R. § 90.303. There are no T-Band public safety incumbents in Cleveland, Ohio, or Detroit, Michigan. *Id*.

[117] 47 C.F.R. § 90.303. Section 90.305(a) requires Private Land Mobile Radio Service (PLMRS) base stations operating in the 470-512 MHz band to be located within eighty kilometers (fifty miles) of the geographic centers of urbanized areas listed in Section 90.303, and requires associated mobile units to restrict their operations to an area within 48 kilometers (thirty miles) of the base station, thus creating a circular area with a radius of 128 kilometers (eighty miles) where PLMRS stations may operate on a primary basis. 47 C.F.R. § 90.305(a). *See* Goosetown Enterprises, Inc., *Memorandum Opinion and Order*, 16 FCC Rcd 12792, 12797-98 ¶ 13 (2001).

[118] *See, e.g.*, County of Franklin, Pennsylvania, *Order*, 25 FCC Rcd 8111 (PSHSB 2009) (granting a waiver to permit PLMRS operations more than 128 kilometers from the geographic center coordinates of Washington D.C./MD/VA); County of Dauphin, Pennsylvania, *Order*, 22 FCC Rcd 8628 (PSHSB 2007) (granting a waiver to permit base stations more than 80 kilometers from the geographic center coordinates of Philadelphia).

[119] *See* Region 28 Comments at 5.

44. We provide T-Band incumbents priority access to the Reserve Channels on the condition that relocating T-Band incumbents (1) commit to returning to the Commission an equal amount of T-Band spectrum and (2) obtain RPC concurrence. For example, a relocating T-Band incumbent seeking sixteen Reserve Channels must commit to return sixteen or more T-Band channels. Reserve Channels in the Affected T-Band Markets will remain unavailable until issuance of a Public Notice opening a filing window for acceptance of applications from T-Band incumbents. T-Band incumbents will enjoy priority access to the 700 MHz Reserve Channels for a five year period starting from the date of a Public Notice announcing the availability of the Reserve Channels, after which we may revisit extending the five year priority access period. We delegate to the Chief of the Public Safety and Homeland Security Bureau the authority to issue such a Public Notice.

45. Finally, we address WMATA's eligibility to relocate to the 700 MHz reserve spectrum to support what WMATA characterizes as "[p]ublic [s]afety and [i]ndustrial uses."[120] The Commission has concluded "that state or local government entities are eligible for licensing in the 700 MHz band without further showing as to eligibility."[121] Consequently, governmental transit agencies, such as WMATA, are eligible to hold 700 MHz narrowband licenses. As the Commission has emphasized, however, "even if the spectrum is *licensed* to a particular entity based on the identity of the *user* under Section 337(f)(1)(B),[[122]] *use* must also conform to the terms of Section 337(f)(1)(A)."[123] Therefore, we reiterate that even though state and local governmental entities, including transit agencies, have access to 700 MHz narrowband spectrum as eligible licensees, uses of this spectrum must conform to the "sole or principal purpose" prong of Section 337(f)(1)(A) (*i.e.* the protection of safety of life, health, or property).[124]

46. <u>*Amount of Spectrum for Deployable Trunked Systems and General Use*</u>. In areas other than the Affected T-Band Markets, we adopt NPSTC's proposal and set aside up to eight 12.5 kilohertz reserve spectrum channels to support deployable trunked systems. We note that several state and local entities already obtained waivers to use six to eight 12.5 kilohertz 700 MHz interoperability channels for deployable trunked systems.[125] We encourage the NRPC and NPSTC to identify specific Reserve Channels to support deployable trunked systems on a nationwide basis that can be incorporated into regional plans within three months from the publication of this *Report and Order* in the Federal Register. To the extent that an RPC designates fewer than eight channels for deployable trunked systems,[126] or in the event that an RPC does not amend its Regional Plan within six months from the publication of this *Report and Order* in the Federal Register to include channels for deployable trunked systems, the channels shall revert to General Use without further action by the Commission.

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[120] *See* Letter from Marc Biondi, Associate General Counsel, WMATA, *Notice of Oral Ex Parte* (filed Aug. 19, 2013); WMATA Amended Waiver Request at 1.

[121] *700 MHz First Report and Order*, 14 FCC Rcd at 180-181 ¶ 54.

[122] 47 U.S.C. § 337(f)(1)(B).

[123] Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, PS Docket No. 06-229, Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100, Request for Declaratory Ruling filed by the City of Charlotte, North Carolina, *Fourth Report and Order*, 26 FCC Rcd. 10799, 10808 ¶ 25 (2011) (emphasis in the original) (*Declaratory Ruling*), citing 47 U.S.C. § 337(f)(1)(A)..

[124] *Declaratory Ruling*, 26 FCC Rcd at 10808 ¶ 25. *See also 700 MHz First Report and Order*, 14 FCC Rcd at 181 ¶ 54 ("Section 337 mandates that this spectrum must be used for *services* whose sole or principal purpose is to protect the safety of life, health or property." (emphasis in original)).

[125] State of Florida, *Order*, 26 FCC Rcd 7730 (PSHSB 2011); City of Mesa, Police Department, *Order*, 26 FCC Rcd 8466 (PSHSB 2011); State of Colorado, *Order*, 27 FCC Rcd 6051 (PSHSB 2012); State of New Jersey, *Order*, 28 FCC Rcd 1358 (PSHSB 2013); State of Idaho, *Order*, 28 FCC Rcd 3251 (PSHSB 2013).

[126] Thus, RPCs have the flexibility to designate a mixture of General Use and temporary (deployable trunked infrastructure) channels in their Regional Plans.

47. We also adopt NPSTC's proposal that (a) mobiles and portables that operate on these eight 12.5 kilohertz channel pairs be licensed by rule, and (b) transportable "fixed" (base and relay) stations be individually licensed as "temporary" (FB2T) stations, with the licensee designating an area of operation, up to and including nationwide.[127] No commenter opposed this proposal. We direct that within six months from the publication of this *Report and Order* in the Federal Register, all licensees that obtained waivers to operate deployable trunked systems on the 700 MHz interoperability channels, shall reprogram their systems to the Reserve Channels identified by NRPC and NPSTC.

48. We conclude that the remaining 12.5 kilohertz Reserve Channels (in areas other than the Affected T-Band Markets) should remain available to address frequency congestion and spectrum shortages in areas not affected by T-Band relocation, and the need for low-power vehicular repeaters. We agree with NPSTC that eight channels will provide sufficient capacity for deployable trunked infrastructure[128] while allowing sufficient General Use channels to accommodate vehicular repeaters and system expansion.

49. *Operational and Technical Parameters for Deployable Trunked Systems.* We decline to adopt NPSTC's proposal to require deployable trunked systems to comply with the Project 25 standard.[129] Under our rules, 700 MHz narrowband equipment need comply with the Project 25 standard only on the designated interoperability channels.[130] Although we recommend that the RPCs and licensees follow American National Standard Institute (ANSI)-approved standards for deployable trunked systems wherever possible, we conclude that specifying operational and technical parameters for deployable trunked systems is unnecessary and premature. Indeed, NPSTC concedes that further study is required with regard to how to design and program deployable trunked systems.[131] RPCs may publish operational and technical parameters in their regional plans. Once ANSI approves operational and technical parameters, or when mission-critical voice becomes available on the FirstNet system, we may revisit this issue.

50. *Co-Channel and Adjacent Channel Interference Protection*. We believe that reallocating the reserve spectrum to General Use under the administration of the RPCs will alleviate many of the interference concerns raised in the *NPRM* concerning temporary systems.[132] Florida appears to recommend applying a unique set of adjacent channel power (ACP) limits to fixed infrastructure on the Reserve Channels "to protect State-Use, General-Use[, and] Interoperable-Use channels."[133] However, there is no record support for this proposal. Instead, other commenters support requiring temporary and permanent operations to follow the relevant technical standards for coordinating 700 MHz channel use within each regional plan to minimize interference.[134] Although the risk of harmful interference from deployable trunked systems may be minimal, we require them – and any new permanent operations on the Reserve Channels – to comply with the Commission's technical rules as well as the operational requirements of the relevant regional plan to safeguard State and General Use operations. This approach is consistent with Commission precedent concerning interference mitigation in the 700 MHz General Use

[127] *NPRM*, 28 FCC Rcd 4820 ¶ 114.

[128] NPSTC Reply Comments at 15.

[129] In comments, NPSTC adds that "use of the Reserve Channels, whether for deployable operations or for additional capacity, should meet a uniform nationwide approach for Project 25 equipment and programming parameters necessary to support deployable systems. NPSTC Comments at 6.

[130] 47 C.F.R. § 90.548.

[131] NPSTC Reply Comments at 15.

[132] *NPRM*, 28 FCC Rcd at 4821 ¶ 119.

[133] Florida Comments at 5.

[134] Harris Comments at 10; Motorola Comments at 8.

spectrum.[135] Accordingly, we decline to adopt a unique set of ACP limits for the former narrowband Reserve Channels that are more rigorous than those that already apply to any transmitter operating on 700 MHz narrowband spectrum.[136]

51. *Low Power Vehicular Repeaters*. New York and the NRPC propose allowing low power vehicular repeaters on the narrowband Reserve Channels nationwide but offer little detail in their filings. Although we find insufficient support in the record to set aside channels in the former reserve spectrum for low power vehicular repeater operations, we do not prohibit the use of these repeaters subject to regional plans. Therefore, we will allow RPCs to designate Reserve Channels for vehicular repeater use provided such use does not (a) result in interference to General Use, State, or interoperability facilities; (b) preclude the use of reserve spectrum to meet spectrum shortfalls or T-Band relocation; (c) conflict with any FCC-approved regional plan; or (d) violate international treaty obligations. Each license application to operate a low power vehicular repeater (MO3)[137] on reserve spectrum channels must be accompanied by RPC concurrence.

D. Power Limit for Low Power Channels

1. Background

52. Sections 90.531(b)(3) and (4) of the Commission's rules designate twenty-four 6.25 kilohertz bandwidth channel pairs for low power mobile-only operations for on-scene incident response.[138] The low power channels fall into two categories: (a) low power channels subject to regional planning and (b) low power channels available for nationwide itinerant operations. The rules limit the ERP on these channels to two watts.[139] In the *NPRM*, the Commission sought comment on NPSTC's proposal to increase the power limit for these channels to twenty watts ERP.[140] The Commission also noted that our existing international coordination agreement with Canada limits the maximum power on all narrowband low power channels to 2 watts ERP for operations within 140 kilometers of the U.S.-Canada border, and sought comment on whether it would be practical to implement a power limit applicable to mobile devices that would apply only outside the U.S.-Canada border region.[141]

53. NPSTC argues that the current power limits for the low power channels are too restrictive and that increasing the power limit to twenty watts will make these channels more effective for on-scene communications in critical safety-of-life situations, particularly for fire department radios operating in high ambient noise environments.[142] Some commenting parties support NPSTC's proposal.[143]

54. Motorola suggests raising the ERP limit to twenty watts only on the low power channels that are subject to regional planning, but opposes raising the limit on the nationwide itinerant low power

[135] *700 MHz First Report and Order*, 14 FCC Rcd at 216-217 ¶ 145 ("Our experience is that where criteria have been clearly set and appropriate inter-regional coordination has occurred, the regionally established criteria have worked well").

[136] *See infra* ¶ 61 and n.159 for a brief discussion of these ACP limits.

[137] Vehicular repeaters are portable transmitters designed to extend the coverage of radio systems and have the Station Class Code MO3.

[138] 47 C.F.R. §§ 90.531(b)(3)-(4).

[139] *Id.*

[140] *See NPRM*, 28 FCC Rcd at 4822-23 ¶¶ 121-125.

[141] *NPRM*, 28 FCC Rcd at 4823 ¶ 125. *See also* Arrangement Q at ¶ 3.2.4(b).

[142] *NPRM*, 28 FCC Rcd at 4822 ¶ 122 (*citing* 2008 NPSTC Petition at 10-11).

[143] Region 6 Comments at 3; Maryland Comments at 23; LA RICS Comments at 3; APCO Comments at 5; Region 21 Comments at 8; CPRA Comments at 4; Region 7 Comments at 4; Adcom911 Comments at 4; ICOM Reply Comments at 5; Maryland Reply Comments at 15.

channels because "there is a higher potential for interference between uncoordinated 20 watt ERP operations."[144] NPRC and Florida agree with Motorola's view.[145] Region 49 opposes increasing the existing power limits for any of the low power channels, arguing that an increase from 2 to 20 watts could "easily negate the unique values inherent to low power operation."[146]

2. Discussion

55. We retain the two watt ERP limit for the low-power channels. The Commission contemplated that the low-power channels would primarily be used on a portable-to-portable or mobile-to-portable basis. Allowing higher power operation would significantly increase the potential for interference at on-scene incidents and limit the ability of users to share these channels,[147] without addressing many of the limitations of two-watt power NPSTC cites in its petition. For example, NPSTC argues that high ambient noise such as that encountered in fire ground operations often results in severe transmission distortion.[148] An increase in RF power, however, will not make a radio less susceptible to interference from acoustical noise or provide a more audible signal in a high ambient noise environment. Indeed, the excess power of the mobile would likely only contribute to potential interference, impairing the ability to use these low-power channels for portable-to-portable or mobile-to-portable mobile communications, fundamentally changing the shared nature of these channels with little or no countervailing benefit. Thus, we find that a rule change that increased the power limit as suggested by NPSTC would not serve the public interest and should not be adopted.

56. We also find it impractical to authorize higher powered devices on the nationwide itinerant low power narrowband channels[149] while prohibiting their use within the coordination zone with Canada. Such a restriction would be confusing to licensees on the nationwide itinerant channels and difficult to enforce on channels which are licensed nationwide and exempt from regional planning. Finally, licensees needing additional transmit power to communicate over long distances or to penetrate RF-resistant buildings have the alternative of using full-power narrowband channels, which allow mobile units to operate at power levels up to 100 watts ERP.[150]

V. MISCELLANEOUS ISSUES

A. Project 25 Compliance Assessment Program

1. Background

57. Section 90.548 of the Commission's rules requires any radio designed to operate on the 700 MHz narrowband interoperability channels to conform to the ANSI 102 Project 25 (P25) technical

[144] *Id.* at 4822 ¶ 123 (*citing* Comments of Motorola, Inc., RM-11433 (filed July 16, 2008) (Motorola NPSTC Petition Comments)).

[145] NRPC Comments at 12-13; Florida Comments at 5.

[146] Region 49 Comments at 2.

[147] Allowing 20 watt mobiles to communicate on the low-power channels with portable units – which have a nominal ERP of 2.5 watts – would result in a system imbalance in which the range would be limited by the portable's ERP.

[148] *See Third Memorandum Opinion and Order*, 15 FCC Rcd at 19859 ¶ 37. Examples of applications the Commission considered appropriate for the narrowband low power channels include: hands free, voice activated firefighter-to-firefighter communications; a personnel accountability reporting (PAR) system for firefighters; police communications in connection with physical surveillance, stakeouts, raids and other such activities; as well as remote control of robotic devices. *Id*. at 19858-59 ¶¶ 35-36 & n.94.

[149] The itinerant channels, by definition, are for on scene portable and mobile use; they may not be used for vehicular repeaters. 47 C.F.R. § 90.531(b)(4).

[150] *See Third Memorandum Opinion and Order*, 15 FCC Rcd at 19859 ¶ 37.

standards.[151] Until recently, no independent testing program existed to verify that radios represented by equipment vendors to be P25-compliant are, in fact, interoperable.

58. In 2005 Congress funded an independent assessment program to test interoperability of all P25 equipment.[152] In 2008, the Department of Homeland Security's Office for Interoperability and Compatibility (OIC) and the National Institute of Standards and Technology (NIST), in partnership with industry and the emergency response community, launched the P25 Compliance Assessment Program (P25 CAP).[153] P25 CAP was established as a voluntary program that establishes an independent compliance assessment process to ensure that communications equipment conforms to P25 standards and is interoperable across vendors.[154] The program provides emergency response agencies with a means of verifying that the equipment they buy, regardless of vendor, is interoperable and otherwise compliant with the P25 standards.

59. The *NPRM* proposed requiring all vendors of 700 MHz narrowband equipment capable of operating on the interoperability channels to obtain P25 CAP certification prior to marketing or sale of such equipment.[155] Although 700 MHz licensees generally favor mandating P25 CAP certification,[156] all equipment manufacturers filing comments submit that the existing voluntary program is working well and that imposing regulation could hinder manufacturers' ability to introduce new products.[157].

2. Discussion

60. The record indicates that 700 MHz equipment manufacturers are uniformly participating in the voluntary CAP certification program, which has helped to ensure that 700 MHz radios operating on the narrowband interoperability channels are, in fact, interoperable. No commenting party has suggested otherwise. Therefore, rather than mandate CAP certification, we amend our rules to further encourage voluntary CAP compliance and to give licensees information regarding the basis for vendor assertions that equipment is interoperable.[158] Thus, we adopt a presumption that a manufacturer that submits its equipment for CAP certification is compliant with Section 90.548 of the Commission's rules. Alternatively, a manufacturer may elect not to submit its equipment for CAP certification, but must disclose in its equipment certification application to the Commission how it determined that its device complies with Project 25 standards and is interoperable across vendors. Finally, while we do not mandate CAP certification, we encourage 700 MHz licensees to require CAP compliance in their contracts for

[151] 47 C.F.R. § 90.548.

[152] *See* Science, State, Justice, Commerce and Related Agencies Appropriations Act of 2006, Pub. L. No. 109-108, § 605, 119 Stat. 2290, 2302; *see* H. R. Rep. No. 109-241 at 81(2005); S. Rep. No. 109-088, at 45 (2005).

[153] *See* Public Safety Communications Research program website at http://www.pscr.gov/projects/lmr/p25_cap/p25_cap.php.

[154] *Id.*

[155] *NPRM,* 28 FCC Rcd 4824 ¶ 127.

[156] Florida Comments at 6; NPRC Comments at 14; Maryland Comments at 24; LA-RICS Comments at 3; SEGARRN Comments at 5; Region 7 Comments at 4-5; Adcom911 Comments at 4.

[157] ICOM America Reply Comments at 4; Motorola Comments at 10, E.F. Johnson Comments at 6.

[158] We note that we are not the first entity to encourage CAP compliance for 700 MHz narrowband radios. DHS/OIC strongly encourages CAP compliance as part of Federal grant programs. *See* Safecom Position Paper, Project 25 -- Helping to Ensure Land Mobile Radio Interoperability, May, 2014, stating: "The use of incompatible equipment will create barriers to achieving interoperability and therefore increase risk to our first responders and the public they serve." *See also* U.S. Dept. of Homeland Security, Office for Interoperability and Compatibility, Project 25 Compliance Assessment Program ¶ 1.1: "Grant applicants proposing equipment that has not gone through P25 CAP testing are requested to submit written justification to Federal granting agencies explaining the need to purchase non-standard equipment and how that purchase will serve the needs of the applicant better than equipment or systems that meet or exceed such standards."

purchase of equipment.

B. Adjacent Channel Power Requirements for Class B Signal Boosters

1. Background

61. Section 90.543(a) of the Commission's rules establishes adjacent channel power (ACP) limits for transmitting devices operating on 700 MHz public safety narrowband frequencies.[159] These ACP limits establish in-band emission limits applicable to all 700 MHz narrowband devices, including Class A and Class B signal boosters.[160] The Commission designed the ACP limits to minimize adjacent channel interference while accommodating a "continuously evolving equipment market in ways that favor competition without favoring any particular technology."[161]

62. The *NPRM* sought comment on a proposal by Dekolink, a manufacturer of 700 MHz public safety narrowband equipment, to exempt Class B boosters from the in-band ACP limits in Section 90.543(a) when these units are simultaneously retransmitting multiple signals, and instead to apply the less restrictive out-of-band emission limits of Section 90.543(c).[162] Dekolink contended that some Class B signal boosters already on the market typically produce intermodulation products in excess of the Section 90.543(a) ACP limits when retransmitting two or more signals.[163]

63. Axell Wireless, the company that purchased Dekolink, argues that the Commission eliminated ACP limits for signal boosters as part of its comprehensive rewrite of the Part 90 signal booster rules in WT Docket No. 10-4.[164] Nonetheless, Axell contends that, if the Commission determines the ACP limits do still apply to signal boosters, it should exempt both Class A and B signal boosters because "it would be practically impossible or economically and technically burdensome for Class B and Class A signal boosters to comply with those requirements."[165]

64. Harris opposes exempting Class B signal boosters from in-band ACP requirements, contending that it "has witnessed numerous cases of problems caused by signal boosters when multiple

[159] 47 C.F.R. § 90.543(a). An ACP emission limit is based upon the absolute and relative levels of coupled power as a function of frequency that ensures that the adjacent channel interference potential of transmitters at various bandwidths is consistent and predictable. *See* Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, *Sixth Notice of Proposed Rulemaking*, 17 FCC Rcd 19303, 19304 ¶ 3 (2002) (*Sixth Notice*).

[160] Signal boosters are devices designed to improve communications by automatically receiving, amplifying and retransmitting signals received from base, fixed or portable stations. 47 C.F.R. § 90.7. Signal boosters are designed to boost signals without changing the frequency of the transmitted signal or exceeding the bandwidth authorized for its transmission. A Class A signal booster is a narrowband device that amplifies only those discrete frequencies intended to be retransmitted whereas a Class B signal booster is a broadband device which amplifies all signals within the passband of the signal booster. *Id*. These devices are often used in public safety communications to improve radio coverage inside buildings. *See* Dekolink slide presentation, submitted June 18, 2008) (Dekolink Presentation) at 3 (on file in PS Docket 13-87).

[161] See Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, First Report and Order and Third Notice of Proposed Rulemaking, 14 FCC Rcd 152, 214 ¶ 138 (1998).

[162] *NPRM*, 28 FCC Rcd at 4824-27 ¶¶129-135. Section 90.543(c) specifies less restrictive out-of-band emission limits for all emissions outside the 700 MHz public safety narrowband spectrum, whereas Section 90.543(a) specifies in-band emission limits.

[163] *NPRM*, 28 FCC Rcd at 4825 ¶ 130. Dekolink discovered this when it was denied certification of one of its own products because they exceeded the ACP limits when transmitting two and three signals.

[164] Letter from Rami Hasarchi, Director – Strategic Projects, Axell Wireless to Marlene H. Dortch, Secretary, Federal Communications Commission, PS Docket 13-87 (Nov. 14, 2013)(Axell Wireless Ex Parte Letter).

[165] *Id.* at 2.

signals are retransmitted."[166] Harris argues that exempting Class B signal boosters will "simply exacerbate the situation and increase interference threat to first responders."[167]

2. Discussion

65. As a threshold matter, we disagree with Axell Wireless's contention that the Commission eliminated ACP limits for signal boosters in its rewrite of the Part 90 signal booster rules. Rather, the *Signal Booster R&O* stated that signal boosters would continue to be required to meet in-band emission limits.[168] Moreover, after Dekolink filed its proposal with the Commission, the *Signal Booster R&O* changed the definition of a Class A signal booster to include any booster with a passband of 75 kilohertz or less.[169] Under this new definition, a Class A signal booster could potentially retransmit multiple signals. Thus, although Dekolink referred to Class B signal boosters in the proposed rule change on which the Commission invited comment in the *NRPM,* we have previously recognized that many signal booster systems include a combination of Class A and Class B signal booster components.[170] We also note that the same considerations apply with even greater force to Class A signal boosters: they are permitted to retransmit multiple signals in the same band, such use becomes infeasible if constrained by the ACP limits, and they operate in accordance with the same low power limits and other rules for interference purposes, with the salutary exception of operating with a *smaller* passband than Class B signal boosters. As the Commission noted in its *Signal Boosters R&O,* Class A boosters "have a lower potential to cause interference because of their narrow passbands . . .."[171] Accordingly, we find that the proposal made in the *NPRM* for exempting Class B signal boosters from our ACP limits when such boosters are simultaneously retransmitting multiple signals, extends logically to Class A signal boosters as well.

66. While we reaffirm that ACP limits apply to signal boosters generally, we exempt both Class A and Class B signal boosters from the ACP limits of Section 90.543(a) when such units are simultaneously retransmitting multiple signals. In lieu of the ACP limits, we will apply the emission limit listed in Section 90.543(c) as suggested by Dekolink.

67. In general, signal boosters transmitting multiple channels exceed the ACP limits in Section 90.543(a) only because these limits apply across the entire band segment of 700 MHz narrowband channels including the paired receive band.[172] By contrast, an emission mask applies only to the fundamental channel (the channel on which the unit is transmitting) and the immediate upper- and lower-adjacent channels.[173] Thus, a signal booster operating in the manner described by Dekolink is no more

[166] Harris Comments at 12; Harris Ex Parte, Oct. 24, 2013, at 2.

[167] Harris Comments at 12.

[168] *See* Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters, WT Docket No. 10-4, *Report and Order*, 28 FCC Rcd 1663, 1726 ¶ 176 (*Signal Booster R&O*). Although it did not specifically mention ACP limits, the Commission did cite to the emission mask limits of Section 90.210 —which are the technique for limiting adjacent-channel emissions in all other public safety frequency bands except the 700 MHz band. *Id. See also* § 90.219(e)(4)(iii).

[169] A Class A signal booster is now defined as any signal booster retransmitting one or more specific channels provided that none of the signal booster's passbands exceed 75 kHz. *See* 47 C.F.R. § 90.219(a). *See also NPRM,* 28 FCC Rcd at 4824 n.337, and source cited therein.

[170] *Signal Booster R&O,* 28 FCC Rcd at 1720 ¶ 157 & n.370.

[171] *Id.,* 28 FCC Rcd at 1715 ¶ 147, 1724 ¶ 169.

[172] *See* 47 C.F.R. § 90.543(a).

[173] For instance, emission mask G, which applies to the 800 MHz band, limits emissions up to 250 percent of the authorized bandwidth. For a transmitter with an authorized bandwidth of 20 kilohertz this would include emissions 50 kilohertz above and below the center frequency. *See* 47 C.F.R. § 90.210(g).

likely to create harmful interference in the 700 MHz band than in any other public safety band, but it violates in-band emission limits only on 700 MHz narrowband spectrum because the ACP restrictions apply to a larger swath of spectrum than an emission mask.

68. We also conclude that applying the ACP limits in this context would be unduly burdensome. First, it could inhibit use of existing signal boosters that enable first-responder communication within buildings. Second, as Axell Wireless notes, it could impose unreasonable requirements and costs in the design of future booster technology.[174] While Harris contends that an ACP exemption could exacerbate interference, it has not documented this contention or shown the feasibility of designing a signal booster that could meet the current ACP limits when retransmitting multiple signals. For the reasons stated above, we find that it is unlikely that the proposed change would result in harmful interference. Accordingly, we are not applying the ACP limits to boosters retransmitting two or more signals. The ACP limits remain in place, however, for boosters retransmitting a single signal.

C. Narrowband Power Limits

1. Background

69. The *NPRM* sought comment on power and antenna height limits for licensees operating on the 700 MHz public safety narrowband channels.[175] It noted that two sets of rules currently govern power limits and, by extension, antenna heights.[176]

70. Section 90.541 of the Commission's rules provides power limits for several categories of transmitters using a combination of effective radiated power (ERP) and transmitter output power (TPO) limits.[177] Section 90.545(b) of the Commission's rules, however, overlaps and conflicts in some respects with Section 90.541 by providing maximum ERP and antenna height above average terrain (HAAT) limits for mostly the same categories of transmitters.[178] Section 90.541 deals solely with power limits, whereas Section 90.545 establishes criteria for public safety licensees to protect co-channel and adjacent-channel full power TV and DTV broadcast stations from interference.[179] Below we summarize each section's categories and limits:

Parameter	**§ 90.541**	**§ 90.545(b)**
Base station power	§ 90.635(a), (b), and (c) (limits are in ERP)	1000 watts ERP
Base HAAT	N/A, but § 90.635 has HAAT limits	Refers to Figure B in § 90.309 for HAAT > 152 meters
Control station power	30 watts TPO	200 watts ERP
Control station HAAT	N/A	61 meters

[174] Boosters designed to meet the ACP limits while retransmitting multiple signals would require either "one amplifier for each individual signal," which would "consume significant amounts of power and dissipate significant amounts of heat," or a very linear high power, more expensive, multicarrier amplifier that also would consume excessive power and dissipate excessive heat. Axell Wireless Ex Parte Letter at 8.

[175] *NPRM*, 28 FCC Rcd at 4827-29 ¶¶ 136-141.

[176] *Id.* at 4827 ¶ 136.

[177] 47 C.F.R. § 90.541.

[178] 47 C.F.R. § 90.545(b).

[179] *See* 47 C.F.R. §§ 90.541 and 90.545.

Mobile station power	30 watts TPO	30 watts ERP
Mobile station ant. Height	N/A	6.1 meters
Portable station power	3 watts TPO	3 watts ERP
Low power channels	2 watts ERP	N/A

71. The *NPRM* proposed consolidating Sections 90.541 and 90.545(b) into a more comprehensive Section 90.541 to harmonize and eliminate redundant, conflicting, or unnecessary rules.[180] The *NPRM* proposed to use ERP limits from Section 90.545(b) in lieu of TPO because "ERP more accurately defines the actual operating power of the radio" while TPO "serves no meaningful purpose" if power limits are already set in terms of ERP.[181]

72. All parties that commented on this issue support deleting Section 90.545 and consolidating power limits into a revised Section 90.541.[182] Many commenting parties also support converting TPO to ERP limits.[183] Some commenting parties, however, support maintaining TPO limits.[184] Motorola argues that devices without integral antennas should have power limits based on TPO because "it is more practical and efficient to measure conducted power and adjacent channel power ('ACP') relative to TPO than to ERP."[185]

2. Discussion

73. We delete Section 90.545 and consolidate all power limits into a more comprehensive Section 90.541. We convert all TPO power limits into ERP and import the ERP limits from former Section 90.545(b) into Section 90.541, with some adjustments. We also correct all cross references in Section 90.541(a) to Section 90.635. The limits in our updated Section 90.541 are summarized below:

Parameter	**§ 90.541**
Base station power	See § 90.635(a)(limits are in ERP)
Base HAAT	See § 90.635(a)
Control station power	200 watts ERP
Mobile station power	100 watts ERP
Portable station power	3 watts ERP

[180] *NPRM*, 28 FCC Rcd at 4828 ¶ 138.

[181] *Id.* at 4828 ¶¶ 138-139. *See also* Amendment of Part 90 of the Commission's Rules and Policies for Applications and Licensing of Low Power Operations in the Private Land Mobile Radio 450-470 MHz Band, WT Docket No. 01-146, RM-9966, *Report and Order*, 18 FCC Rcd 3948, 3954 ¶ 13 (2003) (*Low Power R&O*) *citing* 1998 Biennial Review-47 C.F.R. Part 90-Private Land Mobile Radio Services, WT Docket No. 98-182, *Memorandum Opinion and Order and Second Report and Order,* 17 FCC Rcd 9830, 9840 ¶ 23 (2002).

[182] Region 6 Comments at 4; NRPC Comments at 3; Motorola Comments at 11; Harris Comments at 12-13; Florida Comments at 7; NPSTC Comments at 8-9; APCO Comments at 5-6; Region 7 Comments at 5; Adcom911 Comments at 5.

[183] Region 6 Comments at 4; NRPC Comments at 3; Harris Comments at 13; Florida Comments at 7; Region 7 Comments at 5; Adcom911 Comments at 5.

[184] Motorola Comments at 11-12; APCO Comments at 6 (stating that portable units should continue to be subject to a 3-watt TPO limit).

[185] *Id.*

Low power channels	2 watts ERP

74. We believe ERP limits are more appropriate than TPO limits because ERP more accurately defines the actual operating power of the radio system. TPO simply describes the transmitter power without considering other components of the overall radio system, whereas ERP describes the power of the entire radio system by considering the TPO plus the antenna gain minus any loss factors.[186] In regard to Motorola's concern about the impact that switching from TPO to ERP may have on its ability to certify mobile or portable equipment containing no integral antenna,[187] we clarify that manufacturers may continue the practice of measuring only conducted power[188] when certifying such equipment.[189]

75. For base stations operating on 700 MHz narrowband channels, we maintain the ERP and antenna height limits that currently apply. For control stations, we adopt the 200 watt ERP limit that was specified in former Section 90.545(b).[190] We find 200 watts to be representative of what licensees typically require for control station operation. We eliminate the antenna HAAT limit listed in Section 90.545(b) which applied solely to control stations in the 700 MHz band because control stations are typically licensed to operate within a geographic area and no coordinate or antenna height data are typically associated with a control station on a license. We retain, however, the general Part 90 restriction which limits control station antenna height to 20 feet above ground level when they are licensed on a geographic area basis.[191]

76. For mobile units, we establish an ERP limit of 100 watts. This is an increase over the current thirty watt TPO limit. The increase accounts for the fact that licensees may elect to use high-gain antennas with their mobile units. Since the embedded universe of mobile equipment was previously limited to thirty watts TPO, our increased ERP limit ensures that licensees may continue to use high-gain antennas with their existing inventory of mobile equipment without violating our new ERP limit. A search of our licensing database indicates that, with one exception, no licensee currently operates a 700 MHz mobile unit in excess of 100 watts ERP.[192]

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[186] *See Low Power R&O*, 18 FCC Rcd at 3954 ¶ 12.

[187] Motorola Comments at 11-12.

[188] Conducted power is one of the standard parameters manufacturers are required to measure when applying for an equipment authorization. *See* 47 C.F.R. § 2.1046.

[189] Licensees will ultimately be responsible for complying with our ERP limit based upon the TPO of their mobile or portable transmitter and the gain of the antenna they chose to employ. Manufacturers are required, however, to submit a copy of their equipment installation and operating instructions with their application for certification. This would typically include information about representative and/or specific antennae which may be connected to their equipment and detail the allowed maximum antenna gain for ERP compliance. *See* 47 C.F.R. § 2.1033(c)(3). Manufacturers must also report the maximum power rating of a device, as defined in the applicable rule part(s) (*e.g.*, ERP based upon the updated power limits). *See* 47 C.F.R. § 2.1033(c)(7).

[190] *See* 47 C.F.R. § 90.545(b). A control station is an operational fixed station, the transmissions of which are used to control automatically the emissions or operation of another radio station at a specified location. *See* 47 C.F.R. § 90.7.

[191] There is no limit on the number of control stations which may be authorized on a license if the control stations operate on the same frequency as a mobile station and the height of the antenna does not exceed 6.1 meters (20 feet) above ground or an existing man-made structure (other than an antenna structure). *See* 47 C.F.R. § 90.119(b). Control stations meeting these parameters are licensed over a geographic area in the same manner as a mobile unit. *See* FCC Form 601, Schedule D at items 3 and 4.

[192] We performed our ULS search under radio service codes SG and SY and examined all entries with an MO, MO3 or MOI station class code. One licensee listed an ERP of 282 watts for its mobile units. We question if a licensee

(continued….)

77. For portable units, we establish an ERP limit of three watts. The typical antenna for a portable unit has a negative gain or at most unity gain. Since the embedded universe of portable equipment was previously limited to three watts TPO, an ERP limit of three watts is an appropriate conversion.[193] Furthermore, a search of our licensing database reveals that no licensee operates a portable unit in excess of three watts ERP.[194] For transmitters operating on the low power channels, we maintain the current two watt ERP limit as discussed in a previous section.[195] We encourage vendors, industry groups, and public safety communication organizations to update their training and instructional materials to reflect the management of radio assets by ERP so that instructions to users are clear..

D. Interoperability Network Access Code

1. Background

78. The *NPRM* sought comment on whether we should specify a standardized Network Access Code (NAC), by rule, for use on the 700 MHz interoperability channels.[196] Most commenters support a standard NAC, but are divided on whether the Commission should codify a standard NAC in its rules or just recommend a standard NAC for operation on the interoperability channels.

79. For example, several commenters support the use of APCO/NPSTC ANS 1.104.1-2010 – a standard adopting $293 as the interoperability NAC – for any radio designed to operate on the 700 MHz interoperability channels.[197] Region 28, Maryland and MCP recommend that the Commission implement NAC requirements.[198] Region 6 and Region 21, on the other hand, support the use of a standard NAC but submit that the Commission should not codify it.[199] Region 21 asserts that that NPSTC-recommended NAC $293 is already the "*de facto*" standard and that many regions have already adopted this standard.[200] The City of Savannah, Georgia and the Southeast Georgia Regional Radio Network (SEGARRN) agree that $293 is likely the most commonly used NAC.[201] Florida states that its 700 MHz Public Safety Interoperability Channel Plan requires use of $293 as the NAC for all interoperable voice channels.[202]

80. NRPC and Region 54 urge the Commission to "either recommend or require/establish a Project 25 Network Access Code for the use of 700 MHz interoperability spectrum."[203] They submit that a standard NAC is particularly important because mobile/portable use of the interoperability spectrum is

(Continued from previous page)
could achieve such a high ERP from a mobile unit operating at 30 watts TPO, and find this an excessive power for a mobile unit. *See* call sign WQOA369.

[193] Since ERP is calculated by adding the antenna gain to the TPO and subtracting any loss factors, a portable unit with three watts TPO and a unity gain antenna would have an ERP of three watts assuming no loss factors while a portable unit with a TPO of three watts and a negative gain antenna would have an ERP of less than three watts.

[194] We performed our ULS search under radio service codes SG and SY and examined all entries with an MO, MO3 or MOI station class code listing a TPO of three watts or less.

[195] *See supra* Section IV.D.2.

[196] *NPRM*, 28 FCC Rcd at 4829 ¶ 143. *See* letter from John S. Powell, Chair, National Public Safety Telecommunications Council Interoperability Committee to David L. Furth, Deputy Chief, Public Safety and Homeland Security Bureau (Sept. 11, 2011) (NPSTC Sept. 2011 Letter) at 3 (on file in PS Docket No. 13-87).

[197] Adcom911 Comments at 5; APCO comments at 6; NPSTC Comments at 10; Region 7 Comments at 5.

[198] Region 28 Comments at 6; Maryland Comments at 25; MCP Comments at 8-9.

[199] Region 6 Comments at 20; Region 21 Comments at 9.

[200] Region 21 Comments at 9.

[201] SEGARRN Comments at 5.

[202] *Id.*

[203] NRPC Comments at 3; Regional Planning Committee 54 (RPC 54) Comments at 3.

"licensed by rule" and it is more difficult for users to determine which agencies utilize a given NAC in their mobile/portable radios in adjacent states.[204] To promote consistency in the use of NAC codes, NRPC and Region 54 urge the Commission to require, from each state that has committed to administer the 700 MHz interoperability spectrum, a plan to be updated annually that documents the parameters and variables licensees implement when utilizing these nationwide, common public safety spectrum resources.[205]

2. Discussion

81. We recommend, but do not require, that 700 MHz licensees use NAC $293 as specified in APCO/NPSTC ANS 1.104.1.1-2010. The record suggests that NAC $293 has been widely adopted by Federal, regional, state and local public safety agencies.[206] We note that Maryland supports a uniform NAC but observes that a separate NAC may be useful for air-ground and other operations involving channel sharing.[207] Upon consideration of all the comments, we conclude that the choice of a NAC for interoperability channels is best left to regional, state and local public safety agencies to address according to their operational security and organizational needs. We also decline to require states to submit their interoperability plans to the Commission. While we encourage states to share such plans with each other because it can improve interoperable communications, we do not find it necessary to require submission to the Commission because most states already share their plans with the Department of Homeland Security's Office of Emergency Communications.

E. User Access to Interoperability Channels

1. Background

82. Section 90.547(a) of the Commission's rules specifies that 700 MHz public safety narrowband mobile and portable transmitters "must be capable of operating on all of the designated nationwide narrowband Interoperability channels."[208] The *NPRM* noted that it is unclear whether this rule requires all interoperability channels to be simultaneously available to the user or whether it suffices if radios are capable of being programmed for any interoperability channel.[209]

83. Most commenters support requiring that radios be programmable so that they can operate on any of the interoperability channels, but believe that only a selected subset of the interoperability channels need be available to the user.[210] Harris agrees, but, recommends that such a subset must include the two nationwide interoperability calling channels.[211]

2. Discussion

84. We agree with commenters that the rules should require only that radios be capable of being programmed to operate on all of the interoperability channels, but not require that every radio have every interoperability channel programmed into it and available to the user. This approach is supported

[204] NRPC Comments at 4; Region 54 Comments at 4 citing 47 C.F.R. § 90.525(a).

[205] NRPC Comments at 4-5; Region 54 Comments at 4.

[206] Region 21 Comments at 9.

[207] Maryland Reply Comments at 15-16.

[208] 47 C.F.R. § 90.547(a)(emphasis supplied). Mobile and portable transmitters designed to operate exclusively on the low power or data interoperability channels are exempt from this requirement. *See* 47 C.F.R. §§ 90.547(a)(1) and (2).

[209] *NPRM*, 28 FCC Rcd at 4829 ¶ 144.

[210] APCO Comments at 6; Harris Comments at 13; Maryland Comments at 26; MCP Comments at 9; Motorola Comments at 13; NPSTC Comments at 10; SEAGARNN Comments at 5; Region 21 Comments at 9-10.

[211] Harris Comments at 14.

by the record and is consistent with a similar rule applicable to radios in the 800 MHz band.[212] Although Harris proposes that programming radios on the nationwide interoperability calling channels be made mandatory, we decline to do so because radio programming is a matter best left to public safety agencies in accordance with their needs. However, if a public safety agency wishes to have the interoperability calling channels immediately accessible to the user at all times, as suggested by Harris, it may choose to do so.

F. Analog Operation on Interoperability Channels.

1. Background

85. Section 90.548(a)(1) of the Commission's rules mandates that transmitters designed to operate on 700 MHz narrowband interoperability channels "shall include" a mode of operation conforming to the Project 25 standard (which requires digital modulation).[213] Section 90.535(a) states, however, that mobile and portable transmitters may use analog modulation as a secondary mode of operation.[214] Considered together, these two rules could be construed to mean that analog operation is permitted on the interoperability channels on a secondary basis. The *NPRM* asked whether to permit users to operate their mobile and portable equipment in analog mode on the interoperability channels.[215]

86. Most commenters support prohibiting analog operation on the interoperability channels,[216] citing the incompatibility of analog and digital communications,[217] and urge the Commission to prohibit dual-band equipment (equipment capable of operating in both the 700 and 800 MHz bands) from operating in analog mode on the 700 MHz interoperability channels.[218] However, several commenters argue that RPCs rather than the Commission should decide whether to allow analog operations on interoperability channels.[219]

2. Discussion

87. We conclude that analog operation should be prohibited on the interoperability channels. Specifically, we find that allowing two modulation modes on a channel reserved for interoperable voice communications would seriously impair interoperability. Although we acknowledge the concerns of those parties who believe this is an operational decision best left to the RPCs, doing so could lead to inconsistent regional approaches that would impair nationwide interoperability.

VI. PROCEDURAL MATTERS

A. Regulatory Flexibility Analysis

88. Pursuant to the Regulatory Flexibility Act of 1980,[220] as amended, the Final Regulatory Flexibility Analysis in this *Report and Order* is attached as Appendix A.

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[212] 47 C.F.R. § 90.203(i).

[213] *See* 47 C.F.R. § 90.548(a)(1).

[214] *See* 47 C.F.R. § 90.535(a).

[215] *NPRM,* 28 FCC Rcd at 4830 ¶ 147.

[216] Maryland Reply Comments at 18, Florida Comments at 8, Region 6 Comments at 5, NRPC Comments at 6, Harris Corporation Comments at 15, NPSTC Comments at 11, LA-RICS Comments at 3, APCO Comments at 6, Region 49 Comments at 3.

[217] NPSTC Comments at 11, LA-RICS Comments at 3, APCO Comments at 6

[218] Region 6 Comments at 5, NPRC Comments at 7, Harris Corporation Comments at 15.

[219] Region 7 Comments at 5, Adcom911 Comments at 5. *See also* Motorola Solutions Comments at 13.

[220] *See* 5 U.S.C. § 604.

B. Paperwork Reduction Act Analysis

89. This document contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new information collection requirements contained in this proceeding.

C. Congressional Review Act

90. The Commission will send a copy of this Report and Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act.[221]

VII. ORDERING CLAUSES

91. Accordingly, IT IS ORDERED that, pursuant to Sections 1, 4(i), 303, 316, 332 and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 303, 316, 332 and 337, this *Report and Order* IS HEREBY ADOPTED.

92. IT IS FURTHER ORDERED that the amendments of the Commission's Rules as set forth in Appendix B ARE ADOPTED, effective thirty days from the date of publication in the Federal Register, except for those rules and requirements containing new or modified information collection requirements that require approval by the OMB under the PRA, which WILL BECOME EFFECTIVE after such approval, on the effective date specified in a notice that the Commission publishes in the Federal Register announcing such approval and effective date.

93. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver filed by the Washington Metropolitan Area Transit Authority on June 18, 2013, IS DISMISSED AS MOOT.

94. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver filed by the Los Angeles Regional Interoperable Communications System Joint Powers Authority on December 7, 2012, IS DISMISSED AS MOOT.

95. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver filed by Central Maryland Area Radio Communications (CMARC) on April 3, 2013, IS DISMISSED AS MOOT.

96. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by Weld County, Colorado on February 14, 2013, IS DISMISSED AS MOOT.

97. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by the Region 12, 700 MHz Regional Planning Committee and the State of Idaho Statewide Interoperability Executive Council on February 8, 2013, IS DISMISSED AS MOOT.

98. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by the City of Pueblo, Colorado on December 12, 2012, IS DISMISSED AS MOOT.

[221] *See* 5 U.S.C. § 801(a)(1)(A).

99. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by the County of Douglas, Colorado on December 12, 2012, IS DISMISSED AS MOOT.

100. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by the City of Thornton, Colorado on December 5, 2012, IS DISMISSED AS MOOT.

101. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Request for Waiver and Request for Expedited Review and Action for Rulemaking filed by the Adams County Communications Center, Inc., Colorado on November 29, 2012, IS DISMISSED AS MOOT.

102. IT IS FURTHER ORDERED that, pursuant to Section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. § 154(i), and Section 1.925(b)(3) of the Commission's rules, 47 C.F.R. § 1.925(b)(3), the Petition for Waiver filed by the State of Maryland on December 12, 2013, IS DISMISSED AS MOOT.

103. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this *Report and Order* in a report to be sent to Congress and the General Accounting Office pursuant to the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A).

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Final Regulatory Flexibility Analysis
(*Report and Order*)

1. As required by the Regulatory Flexibility Act (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated into the *Notice of Proposed Rule Making* of this proceeding. The Commission sought written public comment on the IRFA. The RFA[1] requires that an agency prepare a regulatory flexibility analysis for notice-and-comment rulemaking proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[2] The RFA generally defines "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[3] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[4] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[5] The present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.

A. Need for, and Objectives of, the Report and Order

2. In the *Report and Order*, we amend the Commission's rules governing 700 MHz public safety narrowband spectrum at 769-775 MHz and 799-805 MHz. The rule changes adopted are intended to promote flexible and efficient use of public safety narrowband spectrum in the 700 MHz band while reducing the regulatory burdens on licensees wherever possible. In order to achieve these objectives, we:

- Eliminate the December 31, 2016 narrowbanding deadline for 700 MHz public safety narrowband licensees to transition from 12.5 kilohertz to 6.25 kilohertz channel bandwidth technology.[6]
- Redesignate channels in the 700 MHz band that are currently licensed for secondary trunking operations for public safety aircraft voice operations, at a maximum ERP of 2 watts, consistent with NPSTC's 2010 proposal.
- Decline to establish a Nationwide Interoperability Travel Channel.
- Allow voice operations on Data Interoperability Channels on a secondary basis.
- Reallocate the Reserve Channels to General Use Channels and afford T-Band public safety licensees priority for licensing of the former Reserve Channels in T-Band areas.

[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601 *et seq*., has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[2] *See* 5 U.S.C. § 605(b).

[3] 5 U.S.C. § 601(6).

[4] 5 U.S.C § 601(3) (incorporating by reference the definition of "small business concern" in Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[5] 15 U.S.C. § 632.

[6] As a result of our decision to eliminate the 700 MHz narrowbanding deadline, we dismiss as moot several requests for waiver filed prior to and during the pendency of this rulemaking.

- Decline to increase the permissible 2 watt ERP for radios operating on the mobile-only low power channels.
- Encourage manufacturers to demonstrate compliance with Section 90.548 of the Commission's rules (Interoperability Technical Standards) by submitting evidence of Compliance Assessment Program (CAP) approval. Alternatively, manufacturers may provide a document demonstrating how they determined that their devices are interoperable across vendors and meet Section 90.548 requirements.
- Adopt rules governing the spectral output of signal boosters when simultaneously retransmitting multiple signals.
- Adopt effective radiated power (ERP) as a regulatory parameter in place of transmitter power output (TPO).
- Recommend, but do not require, that 700 MHz radios operating on interoperability calling channels employ the Network Access Code (NAC) $293.Clarify that 700 MHz radios must be capable of being programmed to make all 64 interoperability channels immediately accessible, but need not actually be so programmed.
- Clarify that the rules do not allow analog operation on the 700 MHz interoperability channels.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

3. There were no comments filed that specifically addressed the rules and policies proposed in the IRFA.

C. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

4. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of entities that will be affected by the rules.[7] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[8] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[9] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[10]

5. *Public Safety Radio Licensees*. As a general matter, Public Safety Radio Licensees include police, fire, local government, forestry conservation, highway maintenance, and emergency medical services.[11] For the purpose of determining whether a Public Safety Radio Licensee is a small business as defined by the SBA, we use the broad census category, Wireless Telecommunications Carriers (except Satellite). This definition provides that a small entity is any such entity employing no more than 1,500

[7] 5 U.S.C. § 604(a)(3).

[8] 5 U.S.C. § 601(6).

[9] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C. § 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

[10] Small Business Act, 15 U.S.C. § 632 (1996).

[11] *See* subparts A and B of Part 90 of the Commission's Rules, 47 C.F.R. §§ 90.1-90.22.

persons.[12] For this category, census data for 2007 show that there were 11,163 establishments that operated for the entire year.[13] Of this total, 10,791 establishments had employment of 999 or fewer employees and 372 had employment of 1000 employees or more.[14] The Commission does not require Public Safety Radio Licensees to disclose information about number of employees, so the Commission does not have information that could be used to determine how many Public Safety Radio licensees constitute small entities under this definition. Nonetheless, the Commission estimates that the majority of Public Safety Radio Licensees are small entities.[15]

6. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* The Census Bureau defines this category as follows: "This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment."[16] The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees. According to Census Bureau data for 2007, there were a total of 939 establishments in this category that operated for part or all of the entire year. Of this total, 784 had less than 100 employees and 155 had more than 100 employees.[17] Thus, under that size standard, the majority of firms can be considered small.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements

7. This *Report and Order* adopts a rule that will entail reporting, recordkeeping, and/or third-party consultation. Specifically, the *Report and Order* requires all Wireless Communications Equipment Manufacturers who manufacture 700 MHz narrowband equipment capable of operating on the interoperability channels to demonstrate compliance with the Commission's Interoperability Technical Standards. One method of demonstrating this compliance is demonstrating compliance with the Project 25 Compliance Assessment Program (CAP). CAP is a program that establishes an independent compliance assessment process to ensure that communications equipment conforms to Project 25 standards and is interoperable across vendors. The purpose of this rule is to enhance interoperability and provide assurance to licensees that their equipment is interoperable across vendors regardless of which vendor they choose. Thus, the *Report and Order* establishes the presumption that CAP compliance is sufficient to show compliance with Section 90.548. Alternatively, a manufacturer may submit a document describing how it determined compliance with Section 90.548 and that its equipment is interoperable across vendors. The *Report and Order* concludes this is the most effective means of

[12] *See* 13 C.F.R. §121.201, NAICS code 517210.

[13] U.S. Census Bureau, Subject Series: Information, Table 5, "Establishment and Firm Size: Employment Size of Firms for the United States: 2007 NAICS Code 517210" (issued Nov. 2010).

[14] http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ2&prodType=table*Id*. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "100 employees or more."

[15] *See http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ2&prodType=table*

[16] The NAICS Code for this service is 334220. *See* 13 C.F.R 121/201. *See also* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=300&-ds_name=EC0731SG2&-_lang=en

[17] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=4500&-ds_name=EC0731SG3&-_lang=en

ensuring licensee adherence with Section 90.548 of our rules. The estimated burden and cost levels for equipment certification are described in more detail in the supporting statement for OMB Control No. 3060-0057.

8. This *Report and Order* designates the twenty-four 12.5 kilohertz bandwidth reserve channel pairs for General Use subject to the approved regional planning committee regional plans. To date, only 47 out of 55 regions have obtained approval for their plans. As a result, we direct these 47 700 MHz regional planning committees who have obtained approval for their regional plans to modify their plans to reflect the new 700 MHz narrowband General Use reserve spectrum allocation adopted in this *Report and Order*. Therefore, these 47 regions will incur a one time burden as they implement the final rule. Similarly, we estimate that each of the 55 regional planning committees will receive information on how to incorporate the reserve channels into their plans from approximately 20 eligible entities, so that the total number of third party respondents is estimated to be approximately 1100. The estimated burden and cost levels are described in more detail in the supporting statement for OMB 3060-0805, ICR Ref No. 201103-3060-001.

9. This *Report and Order* designates the twenty-four 12.5 kilohertz bandwidth reserve channel pairs for General Use subject to the approved regional planning committees' regional plans. Each applicant for General Use Reserve Spectrum shall notify the relevant Regional Planning Committee(s) prior to filing a license application with the Commission and allow the Regional Planning Committee the opportunity to review the application and prepare a statement of concurrence. Any statement of concurrence from the Regional Planning Committee shall be submitted with the applicant's license application. Therefore, these licensees and regional planning committees will incur a one-time burden each time an application is filed with the Commission. The estimated burden and cost levels are described in more detail in the supporting statement for OMB 3060-1198, ICR Ref. No. 201404-3060-023. Additionally, T-Band incumbents that seek to license the Reserve Channels must commit to return to the Commission an equal amount of T-Band spectrum.

10. This *Report and Order* redesignates the Secondary Trunking Channels to support Air-Ground communications subject to State administration. We assign responsibility for coordinating these channels to the states. Each applicant for Air-Ground spectrum shall notify the relevant State prior to filing a license application with the Commission and allow the State the opportunity to review the application and prepare a statement of concurrence. Any statement of concurrence from the State shall be submitted with the applicant's license application.

11. This *Report and Order* amends the rules to require radios to be capable of being programmed to operate on all sixty-four of the 6.25 kilohertz bandwidth interoperability channels in the 700 MHz band as opposed to requiring radios to operate on the narrowband interoperability channels. This rule change eliminates an ambiguity in the rules and reduces the compliance requirements on public safety licensees.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities and Significant Alternatives Considered

12. The *Report and Order* adopts a number of changes to the rules covering operation of public safety systems on narrowband spectrum in the 700 MHz band. In formulating rule changes in the *Report and Order*, we strived to promote efficient use of the 700 MHz public safety narrowband spectrum while reducing economic burdens on Public Safety Radio Licensees. Absent these rule changes, we conclude that Public Safety Radio Licensees would be subject to increased economic burdens and unnecessary restrictions.

13. *Deadline for Narrowbanding Transition to 6.25 Kilohertz Technology*. The *Report and Order* eliminates the December 31, 2016 deadline for 700 MHz public safety narrowband licensees to transition to 6.25 kHz bandwidth technology and the December 31, 2014 interim deadline for the cessation of marketing, manufacture, or import of 700 MHz narrowband equipment not capable of operating at 6.25 kilohertz efficiency. Elimination of the 2016 deadline, relieves public safety licensees of the economic burden associated with having to replace currently operating communications systems

prior to the end of their life-cycle. Elimination of the 2014 deadline allows for the development of industry standards for 6.25 kHz technology which will allow equipment manufacturers to develop equipment designed for interoperability among equipment of all manufacturers as opposed to equipment that can only communicate with a limited number of vendors' equipment.

14. *Air-Ground Communications on Secondary Trunking Channels*. The *Report and Order* re-designates the secondary trunking channels for air-ground communications to be used by low altitude aircraft and ground based stations. The *Report and Order* concludes there is a need to designate specific channels in the band for use by low-altitude aircraft and that secondary trunking channels are no longer used for their original purpose. Thus, public safety licensees benefit from this rule change because channels in the band which previously remained fallow become available for the increasingly important function of allowing aircraft responding to emergencies to interoperate with public safety officials on the ground.

15. *Nationwide Interoperability Travel Channel*. The *Report and Order* declines to re-designate one of the 12.5 kilohertz *bandwidth* nationwide calling channel pairs as a Nationwide Interoperability Travel Channel. The *Report and Order* concludes that the adverse impact of reducing the overall channel capacity devoted to nationwide calling interoperability outweighs any potential benefit to public safety licensees of designating a nationwide travel channel.

16. *Voice Communications on Data Interoperability Channels*. The *Report and Order* permits voice communications on a secondary basis on both of the two 12.5 kilohertz bandwidth data-only interoperability channels. This rule change benefits public safety licensees by providing them the flexibility to use additional channels for voice interoperability in jurisdictions that only have limited if any demand for data interoperability.

17. *Reserve Channels*. The *Report and Order* designates all twenty four 12.5 kilohertz bandwidth Reserve Channel pairs for General Use subject to approved regional planning committee regional plans. The Reserve Channels had been held in reserve to address public safety's developing needs. To further Congress' goal to facilitate relocation of public safety incumbents in the 470-512 MHz band, the *Report and Order* provides priority access to all twenty four 12.5 kilohertz channel pairs for T-Band relocation in the urban areas specified in Section 90.303 of the Commission's rules. Outside the urban areas specified by Section 90.303, the *Report and Order* permits approved regional planning committees to designate up to eight 12.5 kilohertz channel pairs for temporary deployable trunked use and the rest for General Use, including low power vehicular repeater operation. This approach affords public safety agencies with flexibility in operation on the former Reserve Channels while also avoiding undue economic burdens.

18. *Power Limit for Low Power Channels*. The *Report and Order* declines to increase the power limit on the low power channels from two to twenty watts effective radiated power (ERP). The *Report and Order* concludes public safety licensees would benefit from retaining these channels for their original intended purpose of providing first responders with on-scene low-power communications. The *Report and Order* instructs licensees needing additional transmit power in order to communicate over large distances or to penetrate RF-resistant buildings to consider the numerous full power narrowband channels available in the band.

19. *Compliance with Interoperability Technical Standards*. The *Report and Order* requires equipment manufacturers to demonstrate compliance with the requisite Interoperability Technical Standards as a condition for equipment certification. This will provide a benefit to public safety licensees by ensuring that only equipment that has been tested for trunked and conventional interoperability in a vendor-neutral environment can be marketed. This will provide the additional benefit of engendering competition in the public safety equipment marketplace by eliminating system compatibility as a gating factor when evaluating equipment purchases. We have attempted to reduce the burden on equipment manufacturers by allowing them to meet this standard by demonstrating compliance with the Project 25 Compliance Assessment Program. Compliance with this program is already a requisite for grant eligibility and agency purchasing standards and thus we feel that any new burden imposed by this

requirement would be minimal.

20. *ACP Requirements for Class B Signal Boosters*. The *Report and Order* exempts Class B signal boosters from the ACP limits of Section 90.543(a) only when such units are simultaneously retransmitting multiple signals. In lieu of the ACP limits, the *Report and Order* applies the emission limit listed in Section 90.543(c) to Class B signal boosters operating in this manner. Wireless Communications Equipment Manufacturers who produce Class B signal boosters benefit from this exemption because they will be able to continue manufacturing and marketing signal boosters capable of operating on 700 MHz public safety narrowband spectrum. Public safety licensees benefit from this exemption because they will continue to have access to signal boosters capable of providing in-building RF coverage in this band. Absent this exemption, public safety licensees may have been unable to find solutions for deficiencies in in-building RF coverage.

21. *Narrowband Power Limits*. The *Report and Order* converts all power limits from transmitter output power (TPO) to effective radiated power (ERP) and consolidates all power limits into a more comprehensive Section 90.541. The *Report and Order* also deletes Section 90.545 in its entirety because full power TV and DTV stations no longer occupy the band. Thus, this rule section is no longer necessary. Public safety licensees benefit from this update because all power limits will now be in terms of ERP which more accurately defines the actual operating power of the radio and is therefore more suitable for services—such as 700 MHz public safety narrowband operations—which are subject to licensing and frequency coordination.

22. *Interoperability Network Access Code*. The *Report and Order* declines to specify a standardized Network Access Code (NAC) by rule for operation on the 700 MHz interoperability channels. The NAC is a pre-programmed digital address in a Project 25 radio which allows the radio to "hear" only communications directed to that address from another radio. The *Report and Order* concludes that the choice of a NAC for interoperability channels is best left to regional, state and local public safety agencies to address according to their operational security and organizational needs. This approach affords public safety flexibility in programming radios while avoiding undue economic burdens.

23. *User Access to Interoperability Channels*. The *Report and Order* clarifies that Commission rules require only that radios be capable of being programmed to operate on all of the interoperability channels, but do not require that every radio have every interoperability channel programmed into it and available to the user. This approach affords public safety flexibility in programming radios while avoiding undue economic burdens.

24. *Analog Operation on the Interoperability Channels*. The *Report and Order* declines to permit users to operate their mobile and portable equipment in analog mode on the interoperability channels. In reaching this decision, the *Report and Order* concludes that allowing two modulation modes on a channel reserved for interoperable voice communications would seriously impair interoperability..

F. Federal Rules that may Duplicate, Overlap, or Conflict with the Proposed Rules

25. None.

G. Report to Congress

26. The Commission will send a copy of this *Report and Order*, including this FRFA, in a report to be sent to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996.[18] In addition, the Commission will send a copy of the *Report and Order,* including this FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the *Report and Order* and FRFA (or summaries thereof) will also be published in the Federal Register.[19]

[18] *See* 5 U.S.C. § 801(a)(1)(A).

[19] *See* 5 U.S.C. § 604(b).

APPENDIX B

Final Rules

Part 2 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 2— FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

The authority citation for Part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302, 303, 307, 336, and 337, unless otherwise noted.

Section 2.1033(c) is amended by adding a new paragraph (20) to read as follows:

§2.1033 Application for certification.

* * * * *

(c) * * *

(20) Applications for certification of equipment operating under Part 90 and capable of operating on the 700 MHz interoperability channels (See 90.531(b)(1)) shall include a Compliance Assessment Program Supplier's Declaration of Conformity and Summary Test Report or, alternatively, shall include a document detailing how the applicant determined that its equipment complies with § 90.548 and that the equipment is interoperable across vendors.

Part 90 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

The authority citation for Part 90 continues to read as follows:

AUTHORITY: Sections 4(i), 11, 303(g), 303(r) and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 161, 303(g), 303(r) and 332(c)(7).

Section 90.203 is amended by modifying paragraph (m) and reserving paragraph (n) to read as follows:

§ 90.203 Certification Required.

* * * * *

(m) Applications for part 90 certification of transmitters designed to operate in in 769-775 MHz and 799-805 MHz frequency bands will only be granted to transmitters meeting the modulation, spectrum usage efficiency and channel capability requirements listed in §§ 90.535, 90.547 and 90.548.

(n) [Reserved]

* * * * *

Section 90.531 is amended by modifying paragraph (b) to read as follows:

§ 90.531 Band plan.

* * * * *

(b) * * *

(1) * * *

(i) *Narrowband data Interoperability channels.* The following channel pairs are reserved nationwide for data transmission on a primary basis: 279/1239, 280/1240, 921/1881, and 922/1882. Voice operations are permitted on these channels on a secondary basis.

* * * * *

(iii) *Narrowband trunking Interoperability channels*. The following Interoperability channel pairs may be used in trunked mode on a secondary basis to conventional Interoperability operations: 23/983, 24/984, 103/1063, 104/1064, 183/1143, 184/1144, 263/1223, 264/1224, 657/1617, 658/1618, 737/1697, 738/1698, 817/1777, 818/1778, 897/1857, 898/1858. For every ten general use channels trunked at a station, entities may obtain a license to operate in the trunked mode on two of the above contiguous Interoperability channel pairs. The maximum number of Interoperability channel pairs that can be trunked at any one location is eight.

(2) *Narrowband General Use Reserve channels*. The following narrowband channels are designated for General Use subject to Commission approved regional planning committee regional plans and technical rules applicable to General Use channels: 37, 38, 61, 62, 77, 78, 117, 118, 141, 142, 157, 158, 197, 198, 221, 222, 237, 238, 277, 278, 301, 302, 317, 318, 643, 644, 683, 684, 699, 700, 723, 724, 763, 764, 779, 780, 803, 804, 843, 844, 859, 860, 883, 884, 923, 924, 939, 940, 997, 998, 1021, 1022, 1037, 1038, 1077, 1078, 1101, 1102, 1117, 1118, 1157, 1158, 1181, 1182, 1197, 1198, 1237, 1238, 1261, 1262, 1277, 1278, 1603, 1604, 1643, 1644, 1659, 1660, 1683, 1684, 1723, 1724, 1739, 1740, 1763, 1764, 1803, 1804, 1819, 1820, 1843, 1844, 1883, 1884, 1899, 1900.

(i) *T-Band Relocation*. The narrowband channels established in paragraph (b)(2) are designated for priority access by public safety incumbents relocating from the 470-512 MHz band in the urban areas specified in Sections 90.303 and 90.305 of the Commission's rules provided that such incumbent commits to return to the Commission an equal amount of T-Band spectrum and obtains concurrence from the relevant regional planning committee(s). Public safety T-Band incumbents shall enjoy priority access for a five year period starting from the date the Public Safety and Homeland Security Bureau releases a Public Notice announcing the availability of Reserve Channels for licensing.

(ii) *Deployable Trunked Systems*. Outside the urban areas specified in Sections 90.303 and 90.305 of the Commission's rules, the 700 MHz Regional Planning Committees may designate no more than eight 12.5 kilohertz channel pairs for temporary deployable mobile trunked infrastructure (F2BT) that could be transported into an incident area to assist with emergency response and recovery.

(iii) *General Use*. Outside the urban areas specified in Sections 90.303 and 90.305 of the Commission's rules, the 700 MHz Regional Planning Committees may designate sixteen to twenty four 12.5 kilohertz channel pairs for General Use, including low power vehicular mobile repeaters (MO3).

* * * * *

(6) *Narrowband general use channels.* All narrowband channels established in paragraph (b) of this section, other than those listed in paragraphs (b)(1), (b)(4), (b)(5) and (b)(7) of this section are reserved to public safety eligibles subject to Commission approved regional planning committee

regional plans. Voice operations on these channels are subject to compliance with the spectrum usage efficiency requirements set forth in § 90.535(d).

(7) *Air-Ground Channels*. The following channels are reserved for air-ground communications to be used by low-altitude aircraft and ground based stations: 21/981, 22/982, 101/1061, 102/1062, 181/1141, 182/1142, 261/1221, 262/1222, 659/1619, 660/1620, 739/1699, 740/1700, 819/1779, 820/1780, 899/1859, and 900/1860.

(i) Airborne use of these channels is limited to aircraft flying at or below 457 meters (1500 feet) above ground level.

(ii) Aircraft are limited to 2 watts effective radiated power (ERP) when transmitting while airborne on these channels.

(iii) Aircraft may transmit on either the mobile or base transmit side of the channel pair.

(iv) States are responsible for the administration of these channels.

* * * * *

Section 90.535 is amended by modifying paragraph (a) and (d) to read as follows.

§ 90.535 Modulation and spectrum usage efficiency requirements.

* * * * *

(a) All transmitters in the 769-775 MHz and 799-805 MHz frequency bands must use digital modulation. Mobile and portable transmitters may have analog modulation capability only as a secondary mode in addition to its primary digital mode except on the interoperability channels listed in § 90.531(b)(1). Analog modulation is prohibited on the interoperability channels. Mobile and portable transmitters that only operate on the low power channels designated in §§ 90.531(b)(3), 90.531(b)(4), are exempt from this digital modulation requirement.

* * * * *

(d) Transmitters designed to operate on the channels listed in paragraphs (b)(2), (b)(5), (b)(6) and (b)(7) of § 90.531 must be capable of operating in the voice mode at an efficiency of at least one voice path per 12.5 kHz of spectrum bandwidth.

* * * * *

The title and text of Section 90.541 is amended to read as follows:

§ 90.541 Transmitting power and antenna height limits.

The transmitting power and antenna height of base, mobile, portable and control stations operating in the 769-775 MHz and 799-805 MHz frequency bands must not exceed the maximum limits in this section. Power limits are listed in effective radiated power (ERP).

(a) The transmitting power and antenna height of base stations must not exceed the limits given in paragraph (a) of § 90.635.

(b) The transmitting power of a control station must not exceed 200 watts ERP.

(c) The transmitting power of a mobile unit must not exceed 100 watts ERP.

(d) The transmitting power of a portable (hand-held) unit must not exceed 3 watts ERP.

(e) Transmitters operating on the narrowband low power channels listed in §§ 90.531(b)(3), 90.531(b)(4), must not exceed 2 watts ERP.

The introductory text to Section 90.543 is changed to read as follows:

§ 90.543 Emission limitations.

Transmitters designed to operate in 769-775 MHz and 799-805 MHz frequency bands must meet the emission limitations in paragraphs (a) through (d) of this section. Class A and Class B signal boosters retransmitting signals in the 769-775 MHz and 799-805 MHz frequency bands are exempt from the limits listed in paragraph (a) when simultaneously retransmitting multiple signals and instead shall be subject to the limit listed in paragraph (c) when operating in this manner. Transmitters operating in 758-768 MHz and 788-798 MHz bands must meet the emission limitations in (e) of this section.

* * * * *

Section 90.545 is removed in its entirety.

Section 90.547 is amended by revising paragraph (a) to read as follows:

§ 90.547 Narrowband Interoperability channel capability requirement.

(a) Except as noted in this section, mobile and portable transmitters operating on narrowband channels in the 769-775 MHz and 799-805 MHz frequency bands must be capable of being programmed to operate on all of the designated nationwide narrowband Interoperability channels pursuant to the standards specified in this part.

* * * * *

Section 90.548 is amended by adding a new paragraph (c) to read as follows:

§ 90.548 Interoperability Technical Standards.

* * * * *

(c) Equipment certified by the P25 Compliance Assessment Program is presumed to comply with this section.

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