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47 CFR Parts 1, 2, and 27
Commercial Operations in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz Bands; Final Rule

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 2, and 27

[GN Docket No. 13–185; FCC 14–31]

Commercial Operations in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz Bands

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Federal Communications Commission (Commission) adopts rules governing use of spectrum in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands that will make available significantly more commercial spectrum for Advanced Wireless Services. This additional 65 megahertz of spectrum for commercial use will help ensure that the speed, capacity, and ubiquity of the nation's wireless networks keeps pace with industry demands for wireless service. This is another step in implementing the Congressional directive in Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 to make more spectrum available for flexible uses.

DATES: Effective July 7, 2014 except for the amendment to 47 CFR 2.106 adding Fixed and Mobile allocations for the 2025–2110 MHz band to the Federal Table of Frequency Allocations, which will become effective after the Commission publishes a document in the **Federal Register** announcing the relevant effective date, and except for 47 CFR 2.1033(c)(19)(i)–(ii); 27.14(k), (s); 27.17(c); 27.50(d)(3); 27.1131; 27.1132; 27.1134(c), (f), which contain new or modified information collection requirements that are not effective until approved by the Office of Management and Budget. The Commission will publish a document in the **Federal Register** announcing the effective date for those sections.

ADDRESSES: Federal Communications Commission, 445 12th Street SW., Washington, DC 20554. A copy of any comments on the Paperwork Reduction Act information collection requirements contained herein should be submitted to the Federal Communications Commission via email to *PRA@fcc.gov* and to Cathy Williams, Federal Communications Commission, Room 1–C823, 445 12th Street SW., Washington, DC 20554 or via the Internet at *Cathy.Williams@fcc.gov.*

FOR FURTHER INFORMATION CONTACT: Ronald Repasi, Office of Engineering and Technology, at (202) 418–0768 or *Ronald.Repasi@fcc.gov* or Peter Daronco, Broadband Division, Wireless Telecommunications Bureau, at (202) 418–7235 or *Peter.Daronco@fcc.gov.* For additional information concerning the Paperwork Reduction Act information collection requirements contained in this document, contact Cathy Williams at (202) 418–2918, or via the Internet at *PRA@fcc.gov.*

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's AWS–3 *Report and Order,* FCC 14–31, adopted and released on March 31, 2014 (corrected by *Erratum,* released on May 6, 2014. The full text of this document is available for inspection and copying during normal business hours in the FCC Reference Information Center, Room CY–A257, 445 12th Street SW., Washington, DC 20554. The complete text may be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc. (BCPI), Portals II, 445 12th Street SW., Room CY–B402, Washington, DC 20554, (202) 488–5300, facsimile (202) 488–5563, or via email at *fcc@bcpiweb.com.* The complete text is also available on the Commission's Web site at *http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-14-31A1.docx.* Alternative formats (computer diskette, large print, audio cassette, and Braille) are available by contacting Brian Millin at (202) 418–7426, TTY (202) 418–7365, or via email to *bmillin@fcc.gov.*

Summary

1. With the *Report and Order,* we adopt rules governing use of spectrum in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands that will make available significantly more commercial spectrum for Advanced Wireless Services (AWS). We refer to these bands as AWS–3. This action is another step in implementing the Congressional directive in Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Public Law 112–96, 126 Stat. 156 (2012) (Spectrum Act) to make more spectrum available for flexible uses. It also represents a milestone in speeding commercial access to bands through spectrum-sharing arrangements with incumbent Federal users. In particular, 40 megahertz in the band is being made available for commercial use pursuant to collaboration among the wireless industry and Federal agencies facilitated by the Commerce Spectrum Management Advisory Committee (CSMAC) chartered to advise the National Telecommunications and Information Administration (NTIA).

2. We will license the AWS–3 spectrum in two sub-bands. We will pair the 2155–2180 MHz band for downlink/base station operations with the 1755–1780 MHz band for uplink/mobile operations. The 2155–2180 MHz band is already currently allocated for non-Federal, commercial use. The 1755–1780 MHz band is being made available on a shared basis with a limited number of Federal incumbents indefinitely, while many of the Federal systems will over time relocate out of the band. We also adopt rules to allocate and license the 1695–1710 MHz band for uplink/mobile operations on an unpaired shared basis with incumbent Federal meteorological-satellite (MetSat) data users. We will assign AWS–3 licenses by competitive bidding, offering 5 megahertz and 10 megahertz blocks that can be aggregated using Economic Areas (EAs) as the area for geographic licensing, except for 1755–1760/2155–2160 MHz, which will be licensed by Cellular Market Areas (CMAs).

I. Background

3. *Section 6401 of the Spectrum Act.* In February 2012, Congress enacted the Spectrum Act. That Act includes several provisions designed to make more spectrum available for commercial use. It established, among other things, deadlines applicable to both the Secretary of Commerce and the Commission to identify, reallocate, auction, and license, subject to flexible use service rules, spectrum for commercial use. Specifically, the Spectrum Act requires the allocation of spectrum in the following bands for services that support commercial use: 25 megahertz at 2155–2180 MHz; an additional contiguous 15 megahertz to be identified by the Commission; 15 megahertz between 1675–1710 MHz, to be identified by NTIA by February 2013; and 10 megahertz at 1915–1920 MHz and 1995–2000 MHz, if the Commission finds no harmful interference to the neighboring Personal Communications Service (PCS) band. The Spectrum Act states that the Commission shall grant new initial licenses for all of these bands by February 2015. In June 2013 the FCC adopted service rules for the last of these four bands listed above (1915–1920 and 1995–2000 MHz, or the H Block) in a separate FCC proceeding and the Commission completed the H Block auction on February 27, 2014.

4. The Spectrum Act also amended the Commercial Spectrum Enhancement Act, Public Law 108–494, 118 Stat. 3986, 3991 (2004), codified at 47 U.S.C. 309(j), 923(g), 928 (CSEA). In 2004, the CSEA created the Spectrum Relocation

Fund (SRF) to streamline the process by which Federal incumbents can recover the costs associated with relocating their spectrum-dependent systems from spectrum bands authorized to be licensed under the Commission's competitive bidding authority. *See* 47 U.S.C. 309(j), 928. The Spectrum Act extended the CSEA cost reimbursement mechanism for Federal incumbents to include sharing as well as relocation costs, and to facilitate Federal incumbents sharing of spectrum with commercial users by expanding the types of expenditures that can be funded or reimbursed from the SRF. These changes are intended to permit agencies to receive funds associated with planning for Commission auctions and relocations, spectrum sharing, the use of alternative technologies, the replacement of existing government-owned equipment with state-of-the-art systems, and the research, engineering studies, and economic analyses conducted in connection with spectrum sharing arrangements, including coordination with auction winners. The Spectrum Act also created a new category of allowable pre-auction costs that may, in certain circumstances, be funded before the start of a Commission auction of licenses for applicable eligible frequencies.

5. The conclusion of any auction of eligible frequencies reallocated from Federal use to non-Federal use or to shared use is contingent on obtaining from such auction cash proceeds amounting to at least 110 percent of the total estimated relocation or sharing costs provided to the Commission by NTIA. Proceeds attributable to the 2155–2180 MHz, 1915–1920 MHz, and 1995–2000 MHz non-Federal bands must also be deposited in the PSTF. The Spectrum Act establishes the priority for making payments or deposits from the PSTF as amounts are deposited into the Fund. Spectrum Act section 6413(b), codified at 47 U.S.C. 1457(b). Once the relocation and sharing costs of the Federal incumbents are covered, however, the remainder of the proceeds attributable to eligible Federal frequencies required to be auction under the Spectrum Act must be deposited in the Public Safety Trust Fund (PSTF) rather than the SRF.

6. *CSEA Transition Planning Process.* The CSEA also requires the Commission to notify NTIA at least 18 months before the start of an auction of eligible frequencies and for NTIA to notify the Commission of estimated relocation and sharing costs associated therewith, and timelines for such relocation or sharing, at least 6 months before the start of the auction. On March 20, 2013, the Commission notified NTIA that it ''plans to commence the auction of licenses in the 1695–1710 MHz band and the 1755–1780 MHz band as early as September 2014'' in order to satisfy the Spectrum Act licensing deadline of February 2015. NTIA subsequently notified the affected agencies of their requirement to prepare transition plans.

7. As noted above, the Spectrum Act amended the CSEA to expand the types of costs for which Federal agencies can be reimbursed from the Spectrum Relocation Fund. It also required the Department of Commerce to adopt a common format for Transition Plans, create an expert Technical Panel to review the sufficiency of these transition plans, and adopt a process to resolve disputes regarding the execution, timing, or cost of transition plans. The Technical Panel consists of three members, one appointed by the Director of the Office of Management and Budget (OMB), one appointed by the Assistant Secretary of Commerce for Communications and Information, and one appointed by the Chairman of the Federal Communications Commission. Each member must be a radio engineer or a technical expert. 47 U.S.C. 923(h)(3)(B); *see* 47 CFR 301.100. The Technical Panel reviews each Federal entity's transition plan and reports on its sufficiency. 47 U.S.C. 923(h)(4); *see* 47 CFR 301.120.

8. The Spectrum Act amendments to the CSEA require Federal agencies authorized to use eligible frequencies to submit a Transition Plan to NTIA and the Technical Panel no later than 240 days (*i.e.,* 8 months) before the auction start date. The amendments further require the Technical Panel to submit to NTIA and the applying Federal agency a report on the sufficiency of the Transition Plan no later than 30 days after the submission of the plan (*i.e.,* 7 months, or 210 days, before the auction start date). NTIA must make the Transition Plans available on its Web site with the exception of classified and other sensitive information, no later than 120 days (*i.e.,* 4 months) before the auction start date. 47 U.S.C. 923(h)(5). *See also* Common Format for Federal Entity Transition Plans, Notice of Inquiry in Doc No. 130809701–3701–01, 78 FR 50396, Aug. 19, 2013.

9. *CSMAC Working Groups.* As discussed in the *AWS–3 NPRM,* NTIA established five joint government/industry working groups within its CSMAC to facilitate the implementation of services that support commercial use in the 1695–1710 MHz and 1755–1850 MHz bands. Working Group 1 (WG1) was charged with addressing sharing issues related to the 1675–1710 MHz band, while Working Groups 2–5 were charged with addressing sharing issues related to Federal operations in the 1755–1850 MHz band. WG1's final report, adopted by CSMAC on February 21, 2013, recommended that the Commission adopt a framework for reallocating the 1695–1710 MHz band for commercial use with ''Protection Zones.'' Under this framework, commercial operations could be freely deployed outside of these ''Protection Zones.'' Operations inside these ''Protection Zones,'' however, would require prior successful Federal coordination. With respect to the 1755–1850 MHz band, only WG2's final report was completed before the *AWS–3 NPRM* was released. The Commission noted that the record of the instant proceeding would be informed by NTIA's subsequent recommendations regarding CSMAC's then ongoing study of the potential for Federal/non-Federal spectrum sharing. If NTIA endorsed these reports, the Commission would add them to the record for commenters to discuss in comments, reply comments, or *ex parte* presentations, as appropriate, depending on the timing. *AWS–3 NPRM,* 28 FCC Rcd at 11491 para. 19. *See also* Wireless Telecommunications Bureau and Office of Engineering and Technology Exempt Certain *Ex Parte* Presentations in GN Docket No. 13–185, *Public Notice,* 28 FCC Rcd 12268 (2013).

10. *DoD Proposal.* The *AWS–3 NPRM* also sought comment on two specific proposals for facilitating wireless industry access to the 1755–1780 MHz portion of the 1755–1850 MHz band, including the Department of Defense Alternative Proposal (DoD Proposal). Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC, at 1 (July 22, 2013) (GN Docket No. 09–51, ET Docket 10–123) (*NTIA July 2013 Letter*). *See also id.,* Enclosure 1 (Letter from Teresa M. Takai, Chief Information Officer, DoD, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce (July 17 2013). The other proposal was the ''Industry Roadmap.'' *See AWS–3 NPRM,* 28 FCC Rcd at 11514 para. 78. Under the DoD Proposal, the Commission would be able to auction licenses in the 1755–1780 MHz band in the near term, while protecting DoD's critical capabilities and preserving the flexibility necessary to address the long-term status of the remaining (1780–1850 MHz) portion of this band. DoD proposed to relocate most of its

operations out of the 1755–1780 MHz band by shifting and compressing some operations now at 1755–1850 MHz into the 1780–1850 MHz band and by relocating other operations on a shared basis to the 2025–2110 MHz band. DoD estimated the cost of implementing its proposal at $3.5 billion. *NTIA July 2013 Letter,* Enclosure 1. Under the DoD Proposal, DoD would not seek access to the 5150–5250 MHz band for telemetry. *NTIA July 2013 Letter,* Enclosure 1.

11. *NTIA Endorsement of CSMAC Reports and DoD Proposal.* In a letter filed with the Commission on November 25, 2013, NTIA endorsed the remaining CSMAC reports and transmitted final versions of all five reports to the Commission, which we added to the record of this proceeding. Letter from Letter from Karl B. Nebbia, Associate Administrator, NTIA Office of Spectrum Management to Julius Knapp, Federal Communications Commission at 1 (dated Nov. 25, 2013) (*NTIA November 2013 Letter*). NTIA also fully endorsed the DoD Proposal to relocate most of its operations out of the 1755–1780 MHz band and to gain additional access to the 2025–2110 MHz band by adding primary fixed and mobile allocations to the Federal Table of Frequency Allocations limited to certain military operations with protection and priority for non-Federal fixed and mobile operators in the Television Broadcast Auxiliary Service (BAS), the Cable Television Relay Service (CARS), or the Local Television Transmission Service (LTTS). NTIA clarified that coordination between military and these non-Federal operations should occur via a memorandum of understanding between the Federal and non-Federal fixed and mobile operators. Under this framework DoD operations would share the 2025–2110 MHz band with BAS, CARS, and LTTS, thus enabling DoD to relocate some military operations from the 1755–1780 MHz band to the 2025–2110 MHz band for those operations that could not compress into the 1780–1850 MHz band or could not relocate to other bands allocated for Federal use.

II. Discussion

A. Bands for AWS–3

12. In the *AWS–3 NPRM,* the Commission proposed AWS–3 service rules for the 1695–1710 MHz, 1755–1780 MHz, 2020–2025 MHz, and 2155–2180 MHz bands. We discuss each band below.

13. *1695–1710–MHz.* As discussed in the *AWS–3 NPRM,* in accordance with the Spectrum Act's mandate to identify new commercial spectrum for auction, NTIA identified 1695–1710 MHz for commercial services. The 1695–1710 MHz band is immediately below the AWS–1 uplink band at 1710–1755 MHz. The 1675–1700 MHz band segment is allocated to the meteorological aids service and restricted to radiosonde operation. This portion of the band is also allocated to the MetSat service and is restricted to space-to-Earth operation on a primary basis for Federal and non-Federal use. The 1700–1710 MHz segment is allocated to the fixed and MetSat service on a primary basis for Federal and on a secondary basis for non-Federal use, and restricted to space-to-Earth operation.

14. *Uplink Designation, Block Size and Service Area Size.* In the *AWS–3 NPRM,* to implement NTIA's endorsement of the CSMAC WG1 Final Report, the Commission proposed to limit use of the 1695–1710 MHz band to mobile/uplink operations subject to successful coordination with Federal incumbents prior to operation within 27 Protection Zones. To implement this coordination requirement, the Commission proposed to require all uplink operations in this band to transmit only when controlled by an associated base station. Such base stations located within the 27 Protection Zones would be subject to successful coordination prior to operation of the 1695–1710 MHz uplinks. Additionally, the Commission proposed to license the band in 5 megahertz blocks, noting that a minimum bandwidth of 5 megahertz was necessary to implement the technologies contemplated for the band, and proposed geographic area licensing utilizing 176 Economic Areas (EAs) as the service area size.

15. Commenters generally agree that we should allow only uplink operations in 1695–1710 MHz. Raytheon points out that the record is supportive of the Commission's proposal to limit operations in the band to uplink only while prohibiting fixed operations in these frequencies. T-Mobile does not oppose a requirement that uplink/mobile devices be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.

16. Regarding block and area sizes, most commenters agree with the Commission's proposal to license AWS–3 spectrum in 5 megahertz blocks and to implement geographical area licensing utilizing EAs for the 1695–1710 MHz band. Verizon supports auctioning the AWS–3 spectrum in a combination of 5 and 10 megahertz blocks as these offerings will facilitate the deployment of multiple technologies. DISH favors auctioning 1695–1710 MHz as a single, unpaired 15 megahertz band.

17. We conclude that operations in the 1695–1710 MHz should be limited to mobile/uplink operations for commercial operators, and that the band will not be available for fixed uses or air-to-ground operations. We note that the Commission's proposal in this regard was based on NTIA's endorsement of the CSMAC report, which assumed mobile operations up to 20 dBm EIRP, recommending that commercial use of this band be limited to low-power mobile (uplink) transmission. Furthermore, as Verizon notes, in determining the Protection Zones for these bands, the CSMAC did not consider the impact of high gain or tall antennas on government operations. Additionally, operations in the band will be subject to successful coordination with Federal incumbents in the 27 Protection Zones that we are adopting based on NTIA's endorsement of the CSMAC WG1 Final Report. We believe that the combination of low power, mobile uses along with the designation of the protection zones with coordination requirements will allow commercial and Federal users to co-exist successfully in the band protecting in-band and adjacent band meteorological-satellite receive stations. We also understand that Federal incumbents plan to develop and deploy real-time spectrum monitoring systems for the 1695–1710 MHz band. We will also require that uplink/mobile devices be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations. The Protection Zones for the 1695–1710 MHz band are premised on the distance between the incumbent Federal operations and non-Federal base station(s) that will enable the AWS–3 uplink/mobile operations. Thus, even though the base station is receiving rather than transmitting in the 1695–1710 MHz band, its location inside a Protection Zone triggers the coordination requirement. As discussed in the CSMAC WG1 Final Report the 27 Protection Zones actually protect 47 individual federal MetSat receive stations. *See WG 1 Final Report* at Appendix 1.1 Table 1 for a complete list of MetSat receive stations that are protected. We discuss this requirement further below.

18. We will authorize and license the 1695–1710 MHz band by Economic Areas (EAs) in one 5 megahertz and one 10 megahertz block, which may be aggregated. Economic Areas are geographic areas established by the Bureau of Economic Analysis of the

Department of Commerce and used by the Federal Communications Commission to define the coverage of spectrum licenses for certain services. There are 172 EAs, plus 4 EA-like areas, which have been assigned Commission-created EA numbers: 173 (Guam and the Northern Mariana Islands), 174 (Puerto Rico and the United States Virgin Islands), 175 (American Samoa), and 176 (the Gulf of Mexico). *See* 47 CFR 27.6(a). Specifically, we will offer a 5 megahertz block at 1695–1700 MHz and a 10 megahertz block at 1700–1710 MHz. Offering the spectrum in 5 and 10 megahertz blocks will support the wide range of technologies contemplated for the band, and will match the configuration of other AWS–3 spectrum. The small 5 megahertz block will also facilitate the opportunity for new entrants and smaller businesses to acquire the right to use this spectrum. Because the blocks can be aggregated, potential bidders and future licensees also have the option to acquire the rights to use both blocks within an EA, *i.e.,* a 15 megahertz band as DISH suggests.

19. *Pairing.* In the *AWS–3 NPRM,* the Commission noted that the new AWS–3 band segments could be configured in any number of pairings or even auctioned on an unpaired basis and sought comment on a range of options. Commenters were asked to address whether and how the AWS–3 band segments should be paired, and were also asked to discuss the competitive effects of the available options. The Commission specifically noted CTIA's earlier proposal to designate 2095–2110 MHz for AWS downlink operations paired with 1695–1710 MHz and sought comment on CTIA's recommendation. In this regard, the Commission also noted prior opposition to CTIA's proposal including a feasibility study that NASA had prepared (NASA Study) and NTIA's statement that the NASA Study showed that high-density terrestrial base stations or user equipment operating co-frequency in the 2025–2110 MHz band would exceed established protection criteria for the Tracking and Data Relay Satellite System (TDRSS) spaceborne receivers by an average of 16.4 dB to 40.7 dB and that analysis of sharing with satellite systems of other administrations will likely show similar results.

20. Commenters strongly favor pairing the 1695–1710 MHz band. Moreover, commenters note that pairing the spectrum would allow aggregation of AWS–3 spectrum with AWS–1 spectrum, which would create significantly larger blocks of contiguous paired spectrum that would accommodate higher bandwidths offered by technologies. USCC points out that access to paired spectrum is particularly critical for small and regional carriers, who typically lack sufficient spectrum holdings to pair with newly-acquired spectrum blocks on an asymmetric basis. Thus, commenters state that offering 1695–1710 MHz on a paired basis would boost auction participation, provide for the creation of a single band class, internationally harmonize the spectrum, and result in significant economies of scale. Put differently, Verizon and other commenters state that auctioning the 1695–1710 MHz band as stand-alone uplink spectrum would render it ''virtually useless, as it is the downlink spectrum that carriers, both new and incumbent, most require to meet the skyrocketing demand for mobile broadband bandwidth.'' They note that auctioning 1695–1710 MHz as stand-alone supplemental uplink would significantly decrease the value of the spectrum, relative to auctioning it paired with downlink spectrum, and would limit both its uses and interested bidders. T-Mobile opines that seeking a brief delay of the statutory deadline would be preferable to auctioning and licensing the band unpaired. In contrast, Raytheon notes that there is no requirement in the Spectrum Act to pair this band.

21. Many commenters strongly preferred pairing 1695–1710 MHz with 2095–2110 MHz, which CTIA previously advocated due to the pair's important ability to use the same duplex spacing as the existing and adjacent AWS–1 band. Verizon likewise notes that because 2095–2110 MHz is directly adjacent to AWS–1, adopting this pairing configuration will provide a solid foundation for the next generation of wireless networks and services, including those that will utilize LTE-Advanced technology and ''could ultimately lead to a unified band plan for the 2 GHz spectrum: 1695–1920 MHz for uplink operations and 1930–2200 MHz for downlink operations.'' For this reason, T-Mobile and other commenters initially urged limited relocation of DoD's systems to 2095–2110 MHz.

22. In contrast, Raytheon and Boeing state that 2095–2110 MHz is not an acceptable pairing option for 1695–1710 MHz because the former band supports critical TDRSS communication, which may become critical for manned spaceflight programs, and is currently occupied by Federal users for satellite and non-Federal BAS operations. Raytheon notes that the NASA Study is a comprehensive analysis showing that shared use of 2095–2110 MHz with AWS operations is infeasible. In addition, Raytheon notes that DoD has proposed to relocate some operations in the 1755–1780 MHz band to the 2025–2110 MHz band. Verizon and others contend that the NASA Study is incomplete and that more information is needed from NASA to properly evaluate any technical challenges with additional uses of that band. Verizon states that while the study raises concerns that co-channel mobile services could cause satellite-to-satellite interference in the forward-link transmissions from NASA geostationary Tracking and Data Relay Satellite System (TDRSS) to Low Earth Orbit (LEO) satellites, it is impossible to assess the validity of modeling of propagation, antenna performance, LTE system characteristics, and satellite system characteristics without additional information from NASA. NASA subsequently provided additional information and updated its study to address the most current internationally-agreed parameters of commercial broadband mobile (LTE) systems. *See NTIA November 21013 Letter* Enclosure 6 ''NASA's reply to comments filed with the FCC in response to its AWS–3 NPRM regarding NASA's feasibility assessment for accommodation of mobile broadband long term evolution (LTE) systems in the 2025–2110 MHz band.'' Boeing states that the Updated NASA Study addresses the concerns raised about the initial NASA Study with respect to assuming unrealistically high numbers of transmitting handsets, and correspondingly high aggregate per city handset transmitter power levels. Specifically, Boeing explains that the initial NASA Study relied on the number of handsets specified by CSMAC Working Group 1, prior to the release of updated specifications by Working Party 5D of the International Telecommunications Union Radiocommunication Sector. Because CTIA and other wireless commenters are no longer pursuing the proposal to pair 2095–2110 MHz as the downlink band to be auctioned and licensed paired with 1695–1710 MHz, we reach no conclusions today regarding the initial or updated NASA Studies.

23. Notwithstanding the fact that the 2095–2110 MHz band initially received the most support as the pairing match for the 1695–1710 MHz band, the wireless industry subsequently recognized difficulties with pairing the 2095–2110 MHz band with the 1695–1710 MHz band. Specifically, the industry acknowledged that the challenges associated with Federal and

BAS incumbents in the band would lead to extreme difficulties with allocating, auctioning and licensing 2095–2110 MHz in time to meet the February 2015 deadline for licensing the 1695–1710 MHz band. Additionally, CTIA, the original proponent of this pairing now asserts that the Commission's highest priority is the clearing of the DoD services at 1755–1780 MHz, and points out that the DoD is actively working with the FCC, broadcasters and other Federal agencies to relocate from the 1755–1780 MHz band into a portion of the Broadcast Auxiliary Services at 2025–2110 MHz.

24. Commenters provided other suggestions on possible candidate bands for pairing with 1695–1710 MHz, but also identified serious or insurmountable obstacles with each suggested match. For example, citing a recent NTIA spectrum-monitoring report that, according to T-Mobile, suggests that the 1370–1390 MHz sub-band is lightly used, T-Mobile identified the 1370–1390 MHz band as a possible candidate for pairing with 1695–1710 MHz. But T-Mobile acknowledges technical limitations that weigh against this pairing, in that the 1370–1390 MHz band suffers from a lack of synergy with existing bands, which in turn would require the use of additional base station amplifiers and antennas.

25. In the *AWS–3 NPRM,* the Commission noted SBE's opposition to CTIA's proposal to use 2095–2110 MHz and its ensuing suggestion to instead consider 2360–2390 MHz as an option for pairing with 1695–1710 MHz. In response to this suggestion, AFTRCC responds that this is a principal band used for flight test telemetry and that an LTE allocation at 2360–2390 MHz would create threats to the continued effective operation of safety-of-life Aeronautical Mobile Telemetry (AMT) operations in the band, and would also jeopardize the successful deployment of Medical Body Area Network (MBAN) devices in hospitals and clinics throughout the country. Raytheon agrees that the 2360–2395 MHz band is not suitable for pairing with 1695–1710 MHz, not only because of its designation for primary flight testing, but also because it is designated for secondary medical telemetry uses. Moreover, Raytheon notes that the flight test operations occurring in 2360–2395 MHz are incompatible with both the fixed and mobile high density terrestrial operations that are contemplated for 1695–1710 MHz.

26. Finally, as another possible alternative, TIA suggests pairing 1695–1710 MHz with 2000–2020 MHz for downlink. However, TIA acknowledges that this pairing option is challenging in that it would require the adjustment of incumbents licensed for 2000–2020 MHz as well as the utilization of different duplex spacing and filters.

27. The comments do not identify any particular 15 megahertz of spectrum that can readily pair with 1695–1710 MHz. In the absence of any substantial record support for any such workable pairing at this time, we conclude that the 1695–1710 MHz band should be licensed in an unpaired configuration. We note that no regulation would prohibit licensees from pairing this uplink band with another present or future licensed downlink band. Indeed, our secondary markets and flexible use policies are designed to facilitate the configuration of licenses in their most productive economic use.

28. *1755–1780 MHz. Requirement to Identify 15 Megahertz of Contiguous Spectrum for Commercial Use.* As noted above, the Spectrum Act requires the Commission to identify 15 megahertz of contiguous spectrum for commercial allocation and licensing by auction. In the *AWS–3 NPRM,* the Commission sought comment on appropriate candidates to identify an additional 15 megahertz of contiguous spectrum for commercial use. The Commission proposed, as an example, the identification of the 25 megahertz of contiguous spectrum comprising the 1755–1780 MHz band. The Commission also sought general comment on the allocation of other frequencies in order to meet or surpass this requirement of the Spectrum Act, including CTIA's recommendation of 2095–2110 MHz as the additional 15 megahertz to be paired with 1695–1710 MHz. While several commenters supported CTIA's recommendation, as noted above the record developed on this issue reflects that neither the band identified by CTIA nor any other spectrum is readily available to auction and license paired with 1695–1710 MHz by the statutory deadline of February 2015.

29. Several commenters claim that the Commission cannot identify 1755–1780 MHz to meet the statutory requirement and/or that the statute requires us to identify a band that can be used for downlink operations paired with 1695–1710 MHz. According to CTIA, the legislative history of the Spectrum Act makes clear that Congress intended for the Commission to identify 15 megahertz in addition to the 1755–1780 MHz band. CTIA notes that an earlier version of the House bill would have required the Commission to identify 15 megahertz of contiguous spectrum as well as the 1755–1780 MHz band if technically feasible. This version of the bill also stipulated that the 15 megahertz identified by NTIA and the 15 megahertz identified by the FCC were to be paired together and, according to CTIA, ''this is a logical interpretation of the Spectrum Act, as an alternative reading would cause the 1695–1710 MHz band to be orphaned.'' T-Mobile agrees with CTIA that, based upon the Spectrum Act's parallel mandates that NTIA and the FCC each identify 15 megahertz of spectrum to be made available for commercial use, ''it seems 'apparent that Congress intended for these two 15 megahertz spectrum bands to complement one another through ready pairing for base and mobile station communications.' '' Mobile Future contends that, with the exception of the 2095–2110 MHz band, other spectrum bands considered in the *AWS–3 NPRM* should not be found to satisfy Spectrum Act's directive that the Commission identify another 15 megahertz of spectrum for commercial use.

30. Raytheon and NAB disagree with this statutory interpretation. According to Raytheon, ''Section 6401 of the Spectrum Act simply requires [that 15 MHz of contiguous spectrum] be allocated by the Commission and auctioned in 2015. There is no guidance as to where that spectrum is to be located or indication that it be paired with 1695–1710 MHz band or any other band. (Nothing precludes such a pairing, either.) Similarly, Section 6401 does not provide any direction that the 15 MHz to be auctioned from the 1675–1710 MHz band is to be auctioned on a paired basis. Were the Commission to allocate 1755–1780 MHz, for example, to AWS–3, that action would fully satisfy the unambiguous letter of the statute that an ''additional 15 MHz'' of spectrum be allocated for commercial broadband use, regardless of which band, if any, 1755–1780 MHz is paired. CTIA's argument that the legislative history supports a paired allocation for 1695–1710 MHz is unavailing [cite omitted]. Indeed, the fact the final House bill included a provision for 15 MHz in addition to 1755–1780 MHz, whereas the final legislation was silent on allocating 1755–1780 MHz and where the additional 15 MHz is to come from actually leads to the opposite conclusion, namely that 1755–1780 MHz can be the source of the ''additional 15 MHz'' that Congress requires be auctioned in addition to the specific spectrum bands identified in the Spectrum Act for auction.'' Raytheon Reply Comments at 7–8, n.18. NAB avers that if the Commission were to allocate 1755–1780 MHz, for

example, to AWS–3, that action would fully satisfy the unambiguous letter of the statute that an ''additional 15 MHz'' of spectrum be allocated for commercial broadband use.

31. We agree for the reasons set forth above by Raytheon and NAB that the language of the Spectrum Act permits the Commission to ''identif[y]'' *any* ''[f]ifteen megahertz of contiguous spectrum,'' without regard to its current use or whether it is paired or unpaired. The legislative history is not inconsistent with this plain language, as it shows that Congress did not adopt the House bill reflecting the contrary view. *See* H.R. 3630, 112th Cong. sections 4101(a)(2)(A), (b)(2) (2011) (as passed by the House, December 13, 2011). We note that where Congress intended to signal the pairing of bands (as some commenters suggest is the case for 1695–1710 MHz and the 15 megahertz to be identified by the Commission), it used explicit language. *See, e.g.,* H.R. 3630, 112th Cong. sections 4101(a)(2)(A), (b)(2) (2011) (as passed by the House, December 13, 2011); S. 911, 112th Cong. 2d Sess., section 302(c) (authorizing the Commission to combine 1755–1780 MHz and 2155–2180 MHz ''in an auction of licenses for paired spectrum blocks''). Tellingly, the bill as enacted did not include any requirement to auction ''paired'' spectrum. Accordingly, we are today adopting rules to allocate and license the 1755–1780 MHz band for commercial use, in satisfaction of the Spectrum Act's requirement for us to identify 15 megahertz of contiguous spectrum in addition to the bands specifically identified in the Act. To the extent this entire 25 megahertz band exceeds the requirement of the Spectrum Act to identify 15 megahertz, our action in coordination with NTIA to identify the entire band for commercial use is warranted as integrally related and reasonably ancillary to our mandate under the Spectrum Act (given its pairing with the 2155–2180 MHz band specified in that Act) as well as pursuant to our broad spectrum management authority under Title III of the Communications Act, as amended. The Spectrum Act grants the Commission authority to implement and enforce that Act ''as if . . . a part of the Communications Act of 1934.'' 47 U.S.C. 1403(a). *See also id.* sections 154(i), 303.

32. *Designation for AWS.* In the *AWS–3 NPRM,* the Commission, noting NTIA's report on Federal government use of the 1755–1780 MHz band (as part of the larger 1755–1850 MHz band) and the band's potential as an extension to existing AWS spectrum, proposed uplink mobile use of the band under technical rules similar to AWS–1 uplinks in the adjacent 1710–1755 MHz band. Such use would be subject to Federal requirements, including coordination with incumbent Federal users, emerging from the CSMAC process, if transmitted by NTIA. The Commission sought comment on various methods of sharing the 1755–1780 MHz portion of the 1755–1850 MHz band, including the use of Protection Zones, Exclusion Zones, and other measures. In case the CSMAC and NTIA were unable to recommend clearly defined sharing parameters, the Commission also sought comment on whether to issue ''overlay'' licenses that would permit new licensees to gain access to the 1755–1780 MHz band only if they are able to reach coordination agreements with affected Federal users, *i.e.,* ''operator-to-operator'' coordination. The Commission also sought comment on two additional proposals that addressed commercial use of the 1755–1780 MHz band: The ''Industry Roadmap'' submitted by members of the wireless industry and the ''DoD Proposal'' submitted by DoD. In the ''Industry Roadmap'' the wireless industry assessed Federal operations in the band and proposed to provide industry early access to the 1755–1780 MHz portion of the band. In the ''DoD Proposal,'' DoD also proposed to make the 1755–1780 MHz band available for auction in the near term, while protecting critical military capabilities. Specifically, DoD proposed to modify selected systems operating in the 1755–1780 MHz portion of the band to operate at both 1780–1850 MHz and 2025–2110 MHz, including Small Unmanned Aerial Systems, Tactical Targeting Network Technology, Tactical Radio Relay, and High Resolution Video Systems. DoD also proposed that its Precision Guided Munitions systems would be modified to operate at 1435–1525 MHz; that its Point-to-Point Microwave Links would be modified to operate at 7125–8500 MHz; and that its DoD Video Surveillance/Robotics systems would be modified to operate at 4400–4940 MHz. DoD further proposed that specific systems, namely Satellite Operations (SATOPS), Electronic Warfare (EW), Air Combat Training System (ACTS) (where required), and Joint Tactical Radio System (JTRS) at six sites, would continue to operate in the 1755–1780 MHz portion of the band, but would share that spectrum with commercial users. Finally, DoD proposed to compress its remaining operations into the 1780–1850 MHz portion of the band.

33. Apart from the statutory issue described above concerning the ''additional 15 megahertz of spectrum to be identified by the Commission,'' most commenters strongly favored the Commission's proposal to designate the 1755–1780 MHz band for commercial use. Commenters oppose the use of an overlay license approach to licensing the 1755–1780 MHz band, arguing that the use of such a licensing regime is premature until it is determined that clearing the spectrum for commercial users by relocation is not feasible and that mutual sharing mechanisms cannot be adopted. Issuing overlay licenses, the commenters further argued, would amount to consigning commercial mobile operations to secondary status, would create uncertainty about the nature of rights the licensee would obtain, and would be inconsistent with the Spectrum Act's preference to relocate Federal users to the maximum extent feasible. On the other hand, commenters were generally supportive of the Industry Roadmap and DoD's Proposal and urged the Commission to coordinate with NTIA to clear Federal operations from the 1755–1780 MHz portion of the 1755–1850 MHz band. CTIA argues, however, that DoD has not adequately explained or justified the need for the use of the 2025–2110 MHz band and asks why DoD needs to replace access to 25 megahertz of spectrum with access to 85 megahertz of spectrum.

34. On November 25, 2013, NTIA filed a letter enclosing and endorsing CSMAC's final reports and stating that it fully supports the DoD Proposal submitted to the Commission in July 2013, including DoD's proposal to modify certain military systems to operate at both 1780–1850 MHz, which is currently allocated for Federal use, and at 2025–2110 MHz, which is currently allocated for non-Federal fixed and mobile use and used by operators in the Broadcast Auxiliary Service (BAS), the Cable Television Relay Service (CARS), and the Local Television Transmission Service (LTTS).

35. We note at the outset that some of CSMAC's recommendations regarding sharing are overtaken by the DoD Proposal, under which DoD will relocate most of its operations out of the 1755–1780 MHz band. NTIA has fully endorsed the DoD Proposal and submitted additional details into the record. In light of these actions, we authorize the use of the 1755–1780 MHz band for commercial services in conformance with NTIA's endorsements, the DoD Proposal, and the Spectrum Act.

36. Regarding non-DoD Federal incumbents, NTIA endorsed the findings of WG2 that the two primary video surveillance systems operating in the 1755–1850 MHz band operate in all portions of the band at any time and at any location and thus cannot share the band with commercial operators. NTIA also endorsed WG2's recommendation that EAs to be transitioned should be ranked according to industry implementation priorities, but then clarified that the industry's prioritized list would serve as an input for consideration as agencies develop their transition plans.

37. NTIA responded to CTIA's claims that DoD has not explained the need for access to the 2025–2110 MHz band or why it needs to replace 25 megahertz of spectrum with access to 85 megahertz of spectrum. NTIA explained that because the military systems that are relocating from the 1755–1780 MHz band to the 2025–2110 MHz band must share the latter band with operators in the BAS, CARS, and LTTS services and must comply with the conditions in two new proposed footnotes to the Table of Frequency Allocations, DoD needs the additional spectrum to ensure that it can maintain comparable capability of current activities. Furthermore, according to NTIA, by having access to 85 megahertz of spectrum, the Federal operations will have the flexibility they need without limiting the existing non-Federal users. Under the two new footnotes that NTIA has proposed to the U.S. Table of Frequency Allocations, Federal operations would be limited to the military, and new military operations would be required to be coordinated, via a memorandum of understanding between the Federal and non-Federal fixed and mobile operators in the BAS, CARS, and LTTS.

38. *2155–2180 MHz.* In the *AWS–3 NPRM,* the Commission proposed downlink/base station use of the 2155–2180 MHz band. Because the 2155–2180 MHz band is immediately above the AWS–1 downlink band (2110–2155 MHz) and immediately below the AWS–4 downlink band (2180–2200 MHz), the Commission proposed to license the 2155–2180 MHz band under rules similar to those it adopted for AWS–1 and AWS–4. Commenters agreed with the Commission's proposal.

39. We adopt the proposal in the *AWS–3 NPRM* to authorize downlink/base station use of the 2155–2180 MHz band. Licensing the 2155–2180 MHz band under technical rules similar to those for the adjacent AWS–1 and AWS–4 spectrum efficiently manages the spectrum, will improve economies of scale for mobile device equipment manufacturing, and is consistent with global standards activity in this frequency range. Moreover, downlink operations in the 2155–2180 MHz band would be compatible with similar operations in the adjacent AWS–1 band (2110–2155 MHz) and AWS–4 band (2180–2200 MHz), thus avoiding the need for guard bands. It would also harmonize the rules applicable to 2155–2180 MHz with AWS–1 and AWS–4 downlink spectrum, thus efficiently managing the spectrum and improving economies of scale for mobile device equipment manufacturing. It would also permit stations already designed for AWS–1 to be easily modified to operate at 2155–2180 MHz band, thus allowing operators to quickly deploy this spectrum for consumer use.

40. *Band-Plan for 1755–1780 MHz and 2155–2180 MHz. Uplink/downlink designations and pairing.* In the *AWS–3 NPRM,* the Commission proposed to allow base and fixed, but not mobile, operations in the 2155–2180 MHz band and to allow mobile transmit operations (but to prohibit high-power fixed and base station operations) in the 1755–1780 MHz band. The Commission sought comment on a range of options that included configuring any of the AWS–3 bands in any number of pairings or auctioning any of the AWS–3 bands on an unpaired basis. Commenters favored allowing base and fixed, but not mobile, operations in the 2155–2180 MHz band and to allow mobile transmit operation (but to prohibit high-power fixed and base stations operations) in the 1755–1780 MHz band. Commenters overwhelmingly favored pairing the 1755–1780 MHz band with the 2155–2180 MHz band. According to Verizon, 43 countries are using this spectrum for commercial purposes and 17 of the G–20 countries have allocated this spectrum for commercial use. International harmonization will enhance international roaming, create economies of scale that lowers device costs, speed deployment, and reduce interference potential near international borders.

41. We agree with commenters that we should allow base and fixed, but not mobile, operations in the 2155–2180 MHz band and to allow mobile transmit operations in the 1755–1780 MHz band. We will also prohibit higher-power fixed and base station operations in the 1755–1780 MHz band. Designating the 1755–1780 MHz band for uplink/mobile transmit operations under service rules similar to AWS–1 is consistent with international standards in this frequency range, while designating the 2155–2180 MHz band for downlink operations is compatible with similar downlink operations in the adjacent AWS–1 band at 2110–2155 MHz and the AWS–4 band at 2180–2200 MHz. Moreover, by designating new downlink spectrum adjacent to existing downlink, the industry avoids having to add guard bands or impose significant technical limits between adjacent services, thereby increasing the amount and utility of usable spectrum. As discussed more fully below, we conclude that to facilitate coordination, uplink/mobile devices in the 1755–1780 MHz band must be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.

42. We also agree with commenters that there are many advantages to pairing these two bands. Pairing the 1755–1780 MHz band with the 2155–2180 MHz band adds 50 megahertz of AWS–3 spectrum to the existing 90 megahertz of AWS–1 spectrum. Thus pairing would allow carriers to combine AWS–1 and the 1755–1780/2155–2180 MHz band in a single 140 megahertz band. The 1755–1780/2155–2180 MHz pair would use the same duplex spacing as the existing AWS–1 band, thus facilitating the availability of new devices that can use this band. Allocation of the 1755–1780 MHz band for commercial use with 2155–2180 MHz also harmonizes the U.S. spectrum allocation of this band with international spectrum allocations. In summary, the record reflects that ''[t]he adjacency of these bands . . . will create efficiencies by allowing the same equipment to be used for AWS–1 and AWS–3. These benefits apply not only to network infrastructure, but also to end user equipment. This, in turn, will lower deployment costs and speed LTE buildout in this spectrum. As Motorola Mobility explained, '[t]here would be significant device design benefits to pursuing this pairing. Because the 1755–1780/2155–2180 MHz pairing is symmetrical to the AWS–1 band and has the same duplex spacing, this band could be supported by existing duplexers. . . . [t]hese efficiencies mean that 1755–1780/2155–2180 MHz capabilities likely could be built into devices with minimal additional cost and without a significant impact on battery life, heat production, or other performance characteristics.''' CTIA Reply Comments at 5 quoting Motorola Mobility Comments at 11.

43. Despite these advantages, we note that the Commission is statutorily barred from concluding an auction for ''eligible spectrum'' such as the 1755–1780 MHz band if the total cash proceeds attributable to such spectrum

are less than 110 percent of total estimated relocation or sharing costs. *See* 47 U.S.C. 309(j)(16)(B), 1451(b)(3) (FCC shall not conclude any auction of eligible frequencies if the total cash proceeds attributable to such spectrum are less than 110 percent of total estimated relocation or sharing cost).

44. *Geographic Area Licensing; Service-area size(s).* In the *AWS–3 NPRM,* the Commission proposed to license all AWS–3 spectrum blocks by EAs and sought comment on alternative approaches. The Commission also sought comment on whether there are costs and benefits to adopting an EA licensing approach for bands to be shared with Federal users.

45. Commenters supported one of three different geographic licensing plans: The EA licensing approach proposed by the Commission; a licensing plan based on CMAs; and a hybrid licensing approach where some licenses are based on CMAs and some are based on EAs.

46. We find that there are benefits to adopting a hybrid licensing approach for this spectrum. We note that the Commission adopted a hybrid approach in licensing AWS–1 spectrum based on EAs, Regional Economic Area Groupings (REAGs), and CMAs. In this case, we adopt a hybrid approach and license the 1755–1780 MHz and 2155–2180 MHz bands on an EA and a CMA basis.

47. Adopting a hybrid licensing plan for this spectrum will enable us to achieve several statutory objectives and policy goals. Licensing some areas by CMA will encourage the dissemination of licenses among a variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women, as required by section 309(j) of the Act. Licensing the 1755–1780 and 2155–2180 MHz bands by EA and CMA we have struck the appropriate balance between the needs of large and small carriers. Licensing some areas by EAs will enable large carriers to minimize post-licensing aggregation costs. Also, because EAs are nested within MEAs and REAGs, large carriers will be able to aggregate their spectrum into even larger areas, with minimal aggregation costs. We also note that EA license areas are a useful and appropriate geographic unit that the Commission has used for similar bands. Notably, AWS–1 Blocks B and C are licensed on an EA basis. Licensing three spectrum blocks on an EA basis best balances the Commission's goals of encouraging the offering of broadband service both to broad geographic areas and to sizeable populations while licensing one block by CMAs will enable smaller carriers to serve smaller less dense population areas that more closely fit their smaller footprints. Thus, we further find that adopting this hybrid licensing plan will help us to meet other statutory goals, including providing for the efficient use of spectrum; encouraging deployment of wireless broadband services to consumers; and promoting investment in and rapid deployment of new technologies and services. We designate the spectral blocks for CMAs and EAs in the next section on Block size(s).

48. *Block size(s).* In the *AWS–3 NPRM,* the Commission proposed to license the 1755–1780 and 2155–2180 MHz bands on a geographical area basis in 5 megahertz blocks and sought comment on whether it should adopt a plan using different size blocks. Commenters favored one of two approaches: Licensing the band by 5 megahertz blocks or licensing the band using a combination of 5 and 10 megahertz blocks. Commenters favoring the first approach argue that 5 megahertz blocks align well with a variety of wireless broadband technologies (such as Long-Term Evolution (LTE), Wideband Code Division Multiple Access (W–CDMA), and High-Speed Packet Access (HSPA)), would increase wireless providers' flexibility in auction bidding, and can be aggregated to enable better performance for LTE service and greater bandwidth capacity through wider channels. Commenters that supported a combination of 5x5 megahertz and 10x10 megahertz blocks argue that a combination of license sizes maximizes both utility and efficiency.

49. We conclude that licensing the 1755–1780 and 2155–2180 MHz bands in a combination of 5 and 10 megahertz blocks will promote rapid deployment of new technologies and services for the reasons stated below. Thus we adopt the following licensing plan: Block G at 1755–1760/2155–2160; Block H at 1760–1765/2160–2165; Block I at 1765–1770/2165–2170 MHz; and Block J at 1770–1780/2170–2180 MHz. We further determine to license the 1755–1760/2155–2160 MHz bands by CMA, and to license the remaining paired blocks by EA.

50. Using a combination of 5 and 10 megahertz blocks and a combination of CMAs and EAs will permit licensees maximum flexibility. Such a combination enables both larger and smaller carriers to participate in an auction of licenses to use this spectrum. Moreover, as commenters note, 5 megahertz blocks align well with a variety of wireless broadband technologies, including LTE, W–CDMA, and HSPA. The larger 10 megahertz block will afford larger carriers the ability to offer higher-bandwidth services, as is common in the 10 megahertz AWS–1 blocks. Such a combination may also facilitate coordination with incumbent Federal agencies. For example, designating the 1755–1760 MHz/2155–2160 MHz as the first channel block avoids frequency overlaps and minimizes potential co-channel interference issues with the Space Ground Link System (SGLS), which operates from 1761–1842 MHz.

51. *2020–2025 MHz.* The 2020–2025 MHz band is already allocated for the non-Federal fixed and mobile services and is part of the 35 megahertz (1990–2025 MHz) that the Commission repurposed in 2000 from BAS to emerging technologies such as Personal Communications Services (PCS), AWS, and Mobile Satellite Service (MSS). This repurposing was possible because BAS converted nationwide from seven analog channels (each 17–18 megahertz wide) to seven digital channels (each 12 megahertz wide). In 2004, the Commission proposed to license 2020–2025 MHz for uplink/mobile use paired with 2175–2180 MHz. The Commission did not adopt this proposal and, in 2008 it proposed instead to combine 2175–2180 MHz and 2155–2175 MHz, to make a larger unpaired block at 2155–2180 MHz. The Commission did not make a further proposal for the 2020–2025 MHz band immediately above the AWS–4 uplink band (2000–2020 MHz).

52. In the *AWS–3 NPRM,* the Commission proposed uplink/mobile use of 2020–2025 MHz under rules similar to the AWS–4 rules. Although the Commission did not propose to modify the allocation for this band in the *AWS–3 NPRM,* we proposed changes to several related footnotes in the Table of Frequency Allocations.

53. T-Mobile agrees that 2020–2025 MHz should be cleared to the maximum extent possible and auctioned on a paired basis. T-Mobile states that one option would be for the Commission to consider providing DoD with access to the 2020–2025 MHz band if doing so would allow the 15 megahertz at 2095–2110 MHz to be paired with 1695–1710 MHz. However, T-Mobile states that the most appropriate use of the 2020–2025 MHz band is contingent on the outcome of the then-pending waiver request sought by DISH for flexibility to use 2000–2020 MHz for terrestrial downlink. USCC strongly urges the Commission to focus on maximizing the amount of paired spectrum in deciding which bands to license under the AWS–3 service rules. It argues that

access to paired spectrum is particularly critical for small and regional carriers that typically lack sufficient spectrum holdings to pair with newly-acquired spectrum blocks on an asymmetric basis.

54. The 2020–2025 MHz band is adjacent to the AWS–4 uplink band at 2000–2020 MHz and BAS/CARS/NASA uses at 2025–2110 MHz band. These adjacent uses create challenges with respect to the allocation of this spectrum. EIBASS notes that the band may be at risk of interference from higher-power Electronic News Gathering (ENG) transmitters operating in the 2025–2110 MHz TV BAS band (up to 65 dBm EIRP for ENG platforms vs. 33 dBm EIRP for AWS handsets). This interference would come and go on a seemingly random basis as a mobile ENG transmitter is used near an AWS base station location. This could be a challenge to the AWS user as it appears cellular/AWS use is higher at or near locations of newsworthy events, the same events that ENG trucks would be transmitting from. EIBASS notes that DISH has raised the same concern but notes that broadcasters have dealt with high-power PCS/AWS, specialized filters have been developed, and TV BAS into AWS interference should be a manageable problem.

55. DISH states that designating mobile operation in the 2020–2025 MHz band would make this band vulnerable to significant interference from adjacent Federal government and BAS users above 2025 MHz. DISH states that EIBASS agrees that BAS operations would cause interference to 2020–2025 MHz uplink operations. Regarding EIBASS's view that such interference would be manageable based on PCS/AWS filtering solutions, DISH responds that the existing PCS/AWS to BAS scenario is not representative of the more problematic scenario of interference from BAS into base stations receiving low-power, mobile uplink transmissions in the 2020–2025 MHz band. On the other hand, if 2020–2025 MHz is used for downlinks, DISH agrees with EIBASS that coordination and filtering similar to that used for AWS–1 could be used to protect BAS. Referencing its then-pending waiver request to be able to elect to utilize the 2000–2020 MHz band for downlink operations,'' DISH suggests that the Commission designate 2020–2025 MHz for downlink use if the adjacent AWS–4 band is also used for downlink. If adjacent AWS–4 band is used for uplink operations, DISH states that 2020–2025 MHz also should be designated for uplinks because downlink operations would cause interference to AWS–4 uplink operations, absent severe power and OOBE restrictions to protect AWS–4 uplink operations.

56. T-Mobile and other commenters believe that the Commission may wish to evaluate how best to use the 2020–2025 MHz band but the future use of the 2020–2025 MHz band is uncertain until DISH decides whether it will be using the adjacent AWS–4 spectrum at 2000–2020 MHz for uplink or downlink operations. Sprint supports the auction of 2020–2025 MHz, and recommends that the Commission postpone making a determination on whether the band should be uplink or downlink until after it resolves DISH's waiver petition and Dish makes its election. T-Mobile states that until that time, it is premature to consider whether it may be used to support commercial wireless operations.

57. On December 20, 2013, the Wireless Telecommunications Bureau granted DISH's request, subject to certain conditions, for flexibility to elect to use 2000–2020 MHz for either uplink or downlink operations. One of the conditions requires DISH to file its uplink or downlink election, which shall apply to all AWS–4 licenses, as soon as commercially practicable but no later than 30 months after the December 20, 2013, release date of the Bureau's order. Auctioning and licensing of the 2020–2025 MHz band is not governed by the February 2015 deadline in the Spectrum Act. We agree with some commenters that the public interest is best served by deferring action on the 2020–2025 MHz band, without prejudice to the ultimate disposition of service rules for that band.

B. Technical Rules

58. In addition to protecting other operations that will remain in the AWS–3 bands, as discussed above, we noted in the *AWS–3 NPRM* that our AWS–3 rules must take into account the potential for AWS–3 operations to cause harmful interference to operations in other service areas, in other AWS–3 blocks and in adjacent frequency bands, including both Federal and non-Federal operations. The AWS–3 NPRM therefore sought comment on what technical and operational rules were needed to protect these various services from harmful interference. Where possible, we proposed to adopt for AWS–3 the same technical requirements as apply to AWS–1, where our experience indicates that the requirements have facilitated good service while minimizing undesirable interference, and to AWS–4. However, we recognized that specific AWS–3 spectrum considerations may warrant different requirements, and we asked commenters to address any specific technical rules that they believe necessary for specific AWS–3 bands.

59. With respect to adjacent bands, two predominant types of interference can occur. The first is caused by out-of-band emissions (OOBE) that fall directly within the passband of an adjacent-band receiver. Such emissions cannot be ''filtered out,'' and can only be mitigated through appropriate operation of the transmitter. The second type of interference is caused by ''receiver overload.'' Receiver overload interference occurs when a strong signal from an adjacent band transmission falls just outside the passband of a receiver, where the front-end filter of the receiver can provide only limited attenuation of the unwanted signal. Our rules generally limit the potential for both kinds of interference by specifying OOBE and power limits.

1. OOBE Limits

60. For situations where adjacent spectrum blocks are put to similar uses, our rules commonly require that out-of-band emissions be attenuated below the transmitter power in watts (P) by a factor of not less than $43 + 10 \log_{10} (P)$ dB outside of the licensee's frequency block. Where stricter OOBE limits apply, it is typically because adjacent spectrum blocks are put to different uses—high-power downlink in one block and low-power uplink in the other, for example—or because other special protection requirements exist. Section 27.53(h)(1) of our rules applies this standard limit to AWS–1, and § 27.53(h)(3) specifies the measurement procedure required to determine compliance with the OOBE standard. The *AWS–3 NPRM* sought comment on extending these requirements to the AWS–3 bands.

61. *Interference Protection between Adjacent Block AWS–3 Licensees.* As the *AWS–3 NPRM* noted, we anticipate that the characteristics of the future AWS–3 band systems will be essentially identical to those of AWS–1. For this reason, the *AWS–3 NPRM* proposed that the typical OOBE attenuation factor of $43 + 10 \log_{10} (P)$ dB is appropriate to protect AWS–3 services operating in adjacent spectrum blocks. No commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOBE protection for adjacent AWS–3 spectrum blocks. We therefore adopt an attenuation factor of $43 + 10 \log_{10} (P)$ dB for emissions outside of AWS–3 licensees' frequency blocks into other AWS–3 frequency blocks.

a. Interference Protection to Services in Other Bands—Uplink Stations Operating in 1695–1710 MHz and 1755–1780 MHz

62. *Interference protection to operations below 1695 MHz. Meteorological operations:* The 1695–1710 MHz AWS–3 uplink band is adjacent to satellite downlink spectrum at 1675–1695 MHz, which is allocated for Federal and non-Federal satellite use. The rules for the AWS–1 uplink band at 1710–1755 MHz include an OOBE attenuation factor of our standard 43 + 10 $\log_{10}$ (P) dB in order to protect satellite downlink spectrum currently below 1710 MHz. In addition, § 27.1134(c) of the rules provides that should AWS–1 operations in the 1710–1755 MHz band cause interference to Federal Government operations below 1710 MHz, the AWS–1 licensee must take steps to eliminate the interference. The *AWS–3 NPRM* stated that the services used in this AWS–3 band will be similar to those in the AWS–1 band, and that the repurposing of 1695–1710 MHz essentially just shifts the boundary between AWS uplink and satellite downlink services down from 1710 to 1695 MHz. Accordingly, the *AWS–3 NPRM* proposed to specify the same OOBE attenuation factor for this AWS–3 uplink band as applies to the adjacent AWS–1 uplink band, the standard 43 + 10 $\log_{10}$ (P) dB, and to extend the obligations of § 27.1134(c) to AWS–3 operations in the 1695–1710 MHz band.

63. One commenter expressed concern that the standard OOBE limit may not provide adequate protection for adjacent-band Meteorological Satellite operations. Raytheon argued that, ''[b]efore the Commission adopts an OOBE limit applicable at the 1695 MHz band edge for AWS–3 systems, sufficient testing and/or analysis should be completed to support the Commission's determination in light of the [Emergency Managers Weather Information Network] and other operations below 1695 MHz.'' Raytheon errs in focusing on just one part of the regime we are establishing to protect the 1675–1695 MHz band. The OOBE attenuation factor functions together with the interference-resolution provisions of § 27.1134(c). This combination has worked satisfactorily for the AWS–1 service, and we believe it will serve equally well for AWS–3.

64. *Global Positioning System operations:* GPS operates in the 1559–1610 MHz Radionavigation-Satellite band, (47 CFR 2.106) with a center frequency of 1575.42 MHz and a maximum bandwidth of 20.46 MHz, thus occupying the frequencies 1565.19–1585.65 MHz. The GPS Innovation Alliance (GPSIA) argued that the proposed OOBE limit for the 1695–1710 MHz band ''is no longer effective [in preventing interference to the Global Positioning System (GPS)] given the dramatic increase in RF devices and the [RF] noise floor.'' It recommended that the Commission defer adopting an OOBE limit, and instead participate in a multi-stakeholder task group to develop new GPS spectrum interference standards. CTIA countered that ''these issues are best addressed in other fora, and [that] the Commission should not allow these speculative interference concerns to delay this critical spectrum auction.''

65. The Commission has long recognized the importance of GPS and our responsibility to ensure that it receives appropriate interference protection from other radiocommunication services. However, GPSIA's arguments that the proposed OOBE limit *may* present some risk of interference do not warrant deferring action on the proposed OOBE limit. GPSIA does not support its claims with technical studies and apparently makes worst-case assumptions regarding emissions from AWS–3 mobiles; *i.e.,* ''if appropriate standards are not adopted, manufacturers could begin to produce devices designed with degraded OOBE performance. . . .'' In fact, as GPSIA implicitly concedes, industry standards developed for each radio interface meet or exceed the Commission's OOBE limits, often by significant amounts, and thereby provide an additional margin of interference protection. In addition, parties are free to negotiate private agreements for additional protection, as was the case with the AWS–4 spectrum. *See AWS–4 Report and Order,* 27 FCC Rcd at 16152–53 paras. 121–22. These standards are developed through open working groups, which GPSIA would be free to participate in. Most significantly, however, there is no evidence—in either the record here or our experience generally—that operations in the AWS–1 band have resulted in harmful interference to GPS. AWS–1 handsets and GPS receivers coexist satisfactorily, even when they reside on the same device. The technical operation in the AWS–1 band is virtually identical to what was proposed for this AWS–3 band: Both bands would be populated by low-power mobile devices, both would be governed by the standard 43 + 10 $\log_{10}$ (P) dB OOBE attenuation factor, and both are similarly separated in frequency from the GPS band. In short, for all these reasons, we believe the possibility of harmful interference to GPS is extremely unlikely.

66. Further, suspending this proceeding to reexamine interference standards would likely make it impossible to meet the statutory requirement that this spectrum be licensed by February 2015. In light of our findings above, we believe that the better course is to proceed based on the record herein. Of course we will continue to explore new ways to maximize spectrum efficiency. For example, in ET Docket No. 13–101 we are considering recommendations of the Commission's Technological Advisory Council regarding the use of harm claim thresholds to improve the interference tolerance of wireless systems. Such proceedings provide a more appropriate vehicle to consider evolution of regulatory requirements, including how to transition incumbents to new standards, if that should be necessary.

67. We therefore adopt for the 1695–1710 MHz band an OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB below 1695 MHz.

b. Interference Protection to Operations Above 1710 MHz

68. The 1695–1710 MHz AWS–3 uplink band is adjacent to AWS–1 uplink spectrum at 1710–1755 MHz. Because we anticipate that the services used in these adjacent bands will be similar, the *AWS–3 NPRM* proposed to specify the same OOBE attenuation factor for this AWS–3 band as applies to the adjacent AWS–1 band, the standard 43 + 10 $\log_{10}$ (P) dB. No commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOBE protection for the adjacent AWS–1 band. We therefore adopt for this band an OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB above 1710 MHz.

69. *Interference protection to operations below 1755 MHz.* Likewise, the 1755–1780 MHz AWS–3 uplink band is adjacent to AWS–1 uplink spectrum at 1710–1755 MHz, where we anticipate similar use. Thus the *AWS–3 NPRM* again proposed the same OOBE attenuation factor for this AWS–3 uplink band as applies to the adjacent AWS uplink band, 43 + 10 $\log_{10}$ (P) dB. Again, no commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOBE protection for the adjacent AWS–1 band. We therefore adopt for this band an OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB below 1755 MHz.

70. *Interference protection to operations above 1780 MHz.* The 1755–1780 MHz AWS–3 uplink band is

adjacent to Federal operations at 1780–1850 MHz. The *AWS–3 NPRM* observed that the proposal to designate this band for AWS–3 use would merely shift the boundary between AWS and adjacent-band services, with no significant change in the uses on either side of the boundary. The *AWS–3 NPRM* therefore proposed to maintain the OOBE attenuation factor for the present boundary (*i.e.,* the AWS–1 limit) for this AWS–3 band, again the standard 43 + 10 $\log_{10}$ (P) dB. No commenters dissented from this proposal, and the record does not suggest the presence of any circumstances requiring special OOBE protection for the adjacent Federal operations. We therefore adopt for this band an OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB above 1780 MHz.

c. Interference Protection to Services in Other Bands—Base Stations Operating in 2155–2180 MHz

71. The 2155–2180 MHz AWS–3 downlink band lies between AWS–1 downlink spectrum at 2110–2155 MHz and AWS–4/MSS downlink spectrum at 2180–2200 MHz. Because we anticipate that operations in 2155–2180 MHz and in the adjacent downlink bands will be similar, the *AWS–3 NPRM* proposed that our standard OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB would be sufficient to protect AWS–1 and AWS–4/MSS receivers operating in the adjacent bands. No commenters objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOBE protection for the adjacent AWS–1 and AWS–4/MSS bands. Therefore, we adopt for this band an OOBE attenuation factor of 43 + 10 $\log_{10}$ (P) dB both below 2155 MHz and above 2180 MHz.

d. Measurement of OOBE

72. The Commission's rules generally specify how to measure the power of the emissions, such as the measurement bandwidth. For AWS–1, AWS–4 and PCS, the measurement bandwidth used to determine compliance with this limit for fixed, mobile, and base stations is generally 1 megahertz, with some modification within the first megahertz immediately outside and adjacent to the licensee's frequency block. The *AWS–3 NPRM* proposed to apply this same method to all transmissions in the AWS–3 bands, and sought comment on this proposal. The only party commenting on this proposal supported it. Since there is no opposition to our proposal, and in order to treat the AWS–3 bands in an equivalent manner to other similar bands, we therefore adopt the same requirement for AWS–3 emission limits.

2. Antenna Height Restrictions

73. The *AWS–3 NPRM* proposed that the flexible antenna height rules applicable to AWS–1 base stations should also govern AWS–3 base stations. In addition, since the *AWS–3 NPRM* proposed not to authorize fixed operations in the 1695–1710 MHz and 1755–1780 MHz bands, it tentatively concluded that no special antenna height restrictions are needed for those bands.

74. *Base Stations (2155–2180 MHz).* Part 27 of the Commission's rules does not set out specific antenna height restrictions for AWS–1 base stations. However, pursuant to § 27.56, all services operating under part 27 are required to limit base station antenna heights to elevations that do not present a hazard to air navigation. Additionally, the limitations of field strength at the geographical boundary of the license discussed below effectively limit antenna heights. As a result, because of these inherent height limitations, the *AWS–3 NPRM* proposed that unique antenna height limits were not needed for AWS–3 facilities, and that the general height restrictions of part 27 would be sufficient.

75. The only comments addressing the issue supported this proposal. As the *AWS–3 NPRM* noted, two rules effectively limit base station antenna heights: § 27.56 regarding safety of air navigation and § 22.55(a) limiting the field strength of base station signals at the edge of a licensee's geographic service area. In addition, Motorola commented that ''the need for spectral reuse'' provides a third inhibitor of base station antenna height. For all these reasons, we find no need for a special restriction on the antenna height of AWS–3 base stations operating in the 2155–2180 MHz band.

76. *Fixed Stations (1695–1710 MHz and 1755–1780 MHz).* The *AWS–3 NPRM* proposed to prohibit fixed stations in the 1695–1710 MHz and 1755–1780 MHz bands, because in defining Protection Zones, CSMAC's assumptions did not consider the possibility of commercial fixed uplinks. A fixed station is ''a station in the fixed service,'' which consists of stations at specified fixed points that communicate with each other. 47 CFR 27.4. The *AWS–3 NPRM* therefore tentatively concluded that no antenna height limit would be necessary for these bands. Only one party specifically addressed this issue: Verizon stated that ''the authorization of fixed high gain antennas in these bands could cause interference to government operations and thus the FCC should prohibit their use in these bands.'' We believe that permitting fixed stations in these uplink bands would unduly complicate sharing with Government incumbents, and that the lack of comments asking us to provide for fixed station use in these bands indicates there is no significant demand for it. We therefore adopt the *AWS–3 NPRM's* proposal to prohibit fixed stations from operating in the 1695–1710 MHz and 1755–1780 MHz bands. And with no fixed stations in these bands, there is no need for an antenna height limit, so we will not adopt antenna height restrictions for the 1695–1710 MHz and 1755–1780 MHz bands at this time.

3. Power Limits

77. We will apply the existing AWS–1 EIRP limits to the AWS–3 downlink band at 2155–2180 MHz, as proposed in the *AWS–3 NPRM.* The *AWS–3 NPRM* proposed to depart from the AWS–1 EIRP limits for the AWS–3 uplink bands at 1695–1710 MHz and 1755–1780 MHz, because CSMAC and NTIA recommendations for sharing these bands with Federal incumbents were based on assumed baseline LTE uplink characteristics, which specify that lower EIRP levels would be used. These assumptions were set out in Appendix 3 of the WG1 Final Report. WG1 Final Report, App. 3 (Baseline LTE Uplink Characteristics). This document reflects the consensus of the LTE Technical Characteristics group of the CSMAC Working Groups. Participants included numerous Federal and non-Federal representatives. Consistent with our policy supporting flexible use where possible, we are not adopting technical rules requiring AWS–3 licensees to comply with LTE or any other particular industry standard. Nonetheless, we are adopting Protection Zones for Federal incumbents based on the power levels used for the CSMAC studies, while also requiring larger Protection Zones that would apply should AWS–3 licensees propose to operate uplink stations above 20 dBm EIRP.

78. *Base Stations (2155–2180 MHz).* The current AWS–1 rules limit base station power in non-rural areas to 1640 watts EIRP for emission bandwidths less than 1 megahertz and to 1640 watts per megahertz EIRP for emission bandwidths greater than 1 megahertz, and double these limits (3280 watts EIRP or 3280 watts/MHz) in rural areas. The AWS–1 rules also require that licensees with base stations employing transmit power above 1640 watts EIRP and 1640 watts/MHz EIRP coordinate with affected licensees authorized to operate within 120 kilometers (75 miles)

and with certain satellite entities. Parallel provisions apply to broadband PCS and AWS–4 stations.

79. The *AWS–3 NPRM* proposed to apply similar requirements to AWS–3 base stations operating in the 2155–2180 MHz band because these rules have provided good service while avoiding harmful interference. Specifically, the *AWS–3 NPRM* proposed to limit base station power in non-rural areas to 1640 watts EIRP for emission bandwidths less than 1 megahertz and to 1640 watts per megahertz EIRP for emission bandwidths greater than 1 megahertz, and double these limits (3280 watts EIRP or 3280 watts/MHz) in rural areas. For AWS–3 base stations with transmit power above 1640 watts EIRP and 1640 watts/MHz EIRP, the *AWS–3 NPRM* proposed to require coordination with the following licensees authorized to operate within 120 kilometers (75 miles) of the AWS–3 base or fixed station: All BRS licensees authorized in the 2150–2162 MHz band and all AWS licensees authorized to operate on adjacent frequency blocks in the AWS–3 band, the 2110–2155 MHz band or the 2180–2200 MHz band. Because of the spectral separation between the 2155–2180 MHz band and the 2025–2110 MHz satellite band, however, the *AWS–3 NPRM* did not propose to require coordination with these operators.

80. Commenters generally supported the Commission's proposed technical rules, specifically advocating adoption of regulations consistent with those applicable to the AWS–1 spectrum; no commenter opposed the proposals for base station power limits. The Commission typically adopts the same rules for similar adjacent band services, and we see no compelling reason to do otherwise here. Accordingly we adopt the AWS–3 base station power limits proposed in the *AWS–3 NPRM* and described in the preceding paragraph.

81. *Mobile and Portable Stations (1695–1710 MHz and 1755–1780 MHz).* For AWS uplink bands, our rules specify different power limits for different bands, depending on each band's particular circumstances. AWS–4 uplinks are generally limited to 2 watts EIRP, while AWS–1 uplinks are limited to 1 watt EIRP in order to simplify coordination with Government operations that remain in the AWS–1 uplink band, a situation that the AWS–4 band did not present. In this respect the two AWS–3 uplink bands under consideration here are similar to the AWS–1 uplink band in that they all contain Government operations, and this circumstance requires careful consideration of the power limit in order to assure satisfactory sharing of the bands with Government incumbents.

82. As described above, in conducting studies for coexistence of commercial and Federal systems in the AWS–3 uplink bands, CSMAC made assumptions about the power output of typical commercial user equipment for the purpose of defining Protection Zones. Specifically, CSMAC assumed that typical commercial user equipment will be LTE devices. The LTE standard sets a maximum transmitter power output (TPO) of 23 dBm. CSMAC's analysis indicates that such devices will have an actual EIRP varying between -40 dBm and 20 dBm, however, due to power control and typical antenna gains/losses. CSMAC used these EIRP values to assume a maximum power of 20 dBm EIRP (100 mW) for the purpose of defining the Protection Zones. For this reason, the Commission proposed to limit power to the 20 dBm EIRP for mobiles and portables operating in the 1695–1710 MHz and 1755–1780 MHz bands.

83. The Commission also noted its intent to adopt flexible-use service rules for the AWS–3 band supporting terrestrial wireless service and that it was not proposing to mandate the use of any industry standard. In this regard, the Commission observed that similar commercial mobile services such as PCS, AWS–1, and the 700 MHz band deploy handsets using a variety of technologies, including CDMA and UMTS, as well as LTE, whose devices most commonly operate at a maximum EIRP of 23 dBm (200 mW) regardless of higher FCC power limits such as the maximum EIRP limit of 1 watt (30 dBm) for the AWS–1 uplink band. Recognizing that the Commission's technical rules will govern all devices nationwide, rather than typical devices operating near Federal incumbents, the Commission sought comment on whether the benefits of a higher power limit would outweigh the increased burden of having to coordinate more commercial operations with Federal incumbents. The *AWS–3 NPRM* further proposed that mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

84. While the 20 dBm EIRP figure is a reasonable assumption from which to determine the area where the potential for interference requires coordination with incumbents, a power limit higher than proposed is feasible, so long as the size of the Protection Zones reflects whatever limit we adopt so that, if a licensee proposes to operate above 20 dBm EIRP, this higher power factors into the coordination analysis.

85. Wireless industry commenters nearly unanimously supported the benefits of a higher power limit over the increased burden of coordination. AT&T suggested that a 20 dBm EIRP limit ''would effectively require the adoption of a separate 3GPP standard for AWS–3.'' Motorola argued that the proposed 20 dBm limit is inherently flawed because it was based on the 23 dBm total power output limit set by the LTE standard, less 3 dB in assumed losses from issues such as negative antenna gain. Actual losses, it said, will be greater, which justifies a higher power limit in the Commission's rules. Further, Motorola notes the important role of automatic power control in mobile networks, citing a 3GPP simulation showing that ''the average transmit power across all devices in a mobile network is below 1 dBm and that 95 percent of all devices transmit with a power below 7 dBm.'' DISH makes a similar argument regarding automatic power control, and also notes that the Interference Power Spectral Density level can be controlled by limiting the number of simultaneously transmitting mobiles around Protection Zones, rather than restricting the mobile maximum power to 20 dBm, thus preserving the current Protection Zone boundaries. DISH adds that limiting the number of simultaneous mobile transmissions has an added advantage of providing protection while preserving wireless coverage footprints typical LTE devices can support. These commenters suggest a range of alternatives for the AWS–3 uplink power limit, including 23 dBm, 23 dBm +/− 2 dB or 25 dBm (all based on the LTE standard), and 30 dBm (the AWS–1 limit).

86. On the other hand, Raytheon argued that ''[f]ailure to mandate an LTE standard could impact directly the validity, already qualified, of the analysis determining the proposed contours of the Protection Zones. . . . [I]f the Commission chooses to forego mandating use of the LTE standard by auction winners, the Commission should establish *larger* Protection Zones to create an umbrella allowing for the use of other standards.''

87. Based on the record before us, we are persuaded that the benefits of a higher EIRP limit outweigh the burden of additional coordination. Therefore, for the sake of uniformity among AWS–1 and AWS–3 equipment requirements and to facilitate industry standard setting in accordance with the basic interoperability requirement that we adopt herein for 1710–1780 MHz stations, we adopt an AWS–3 uplink

power limit of 30 dBm EIRP. We emphasize that this EIRP limit is largely a matter of equipment certification and that AWS–3 licensees are not authorized, as a matter of right, prior to successful coordination, to operate mobile and portable stations up to this EIRP limit. Additionally, we agree with Raytheon that the Protection Zones must be properly calibrated to account for any operations above 20 dBm EIRP. We also adopt the *AWS–3 NPRM's* uncontested proposal to require that mobile and portable stations operating in these bands employ a means for limiting power to the minimum necessary for successful communications.

88. Accordingly, the 27 Protection Zones for 1695–1710 MHz will be defined at two maximum protection distance scenarios: operations up to 20 dBm EIRP, as proposed in the *AWS–3 NPRM,* and operations above 20 dBm EIRP up to 30 dBm EIRP. The Protection Zones are the product of consultations between the Commission and NTIA. For base stations that enable mobiles to operate with a maximum EIRP greater than 20 dBm, up to a maximum EIRP of 30 dBm, nationwide coordination will be required. These requirements reflect the optimum scenarios for AWS–3/Federal sharing of these bands, and provide ample opportunity to ensure that incumbent Federal operations are fully protected. The real-time spectrum monitoring systems that Federal incumbents are planning will also, once deployed, help to maximize commercial use of the band while protecting Federal meteorological-satellite receive stations.

89. For the 1755–1780 MHz band, the default Protection Zone is nationwide. Therefore, all AWS–3 operations in this band, including proposals to operate above 20 dBm EIRP, will have to be successfully coordinated with all relevant Federal incumbents. In the coming months, the Commission and NTIA intend to jointly issue one or more public notices establishing coordination procedures and, if possible, more refined Protection Zones for operations up to 20 dBm EIRP. This forthcoming action will not affect operations above 20 dBm EIRP (and up to the 30 dBm EIRP limit) for which the nationwide Protection Zone will remain applicable.

90. We also recognize CSMAC's suggestion that the aggregate signal level from all licensees measured as a power flux density at the geostationary orbit (GSO) arc should not exceed −179 dBW/Hz/m^2. CSMAC concluded that it is unlikely that the aggregate power flux density from user devices at the GSO arc will reach −179 dBW/Hz/m^2 and that AWS operations are unlikely to impact Federal Space Operations reception in the GSO arc, assuming user devices operate with a maximum EIRP of 20 dBm. Further, the *WG3 Final Report* indicated that there is a positive 7.6 dB margin at the −179 dBW/Hz/m^2 power flux density level, and AWS–3 mobile devices will typically operate with significantly lower EIRP levels than assumed in the *WG3 Final Report.* We nonetheless recognize the legitimate issue of aggregate power flux density possibly affecting incumbent operations and that Federal satellite operators will routinely monitor the aggregate power flux density level at the satellites. AWS–3 licensees are on notice that the Commission will revisit the matter and take appropriate action if it is demonstrated that the aggregate power flux density level from all mobile devices in a 10 megahertz bandwidth in the 1761–1780 MHz band could impact Federal Space Operations reception in the GSO arc, *i.e.,* is approaching −179 dBW/Hz/m^2.

4. Co-Channel Interference Between AWS–3 Systems

91. As discussed above, we determine to license AWS–3 on an EA and CMA geographic license area basis. The Commission observed in the *AWS–3 NPRM* that should this spectrum be licensed on a less than nationwide basis, it would be necessary to ensure that licensees do not cause harmful interference to co-channel systems operating along their common geographic boundaries. To resolve any such interference, the *AWS–3 NPRM* proposed to adopt a boundary limit approach, with a boundary field strength limit of 47 dBμV/m, the same as applies to other services similar to AWS–3, including AWS–1 and AWS–4. The alternative would be to require prior coordination of base stations located near geographic boundaries. The *AWS–3 NPRM* noted that some commenters in other proceedings have suggested that the boundary limit be adjusted to accommodate varying channel bandwidths, and sought comment on these options. The *AWS–3 NPRM* also sought comment on its proposal that licensees operating in adjoining areas should be permitted to employ alternative, agreed-upon signal limits at their common borders. Except for T-Mobile, which argued that the field strength limit be adjusted to accommodate for varying channel bandwidths, commenters did not oppose the Commission's proposals to protect adjacent licensees from co-channel interference.

92. We adopt the proposed boundary limit approach for co-channel interference. As discussed above, the Commission will license AWS–3 on a geographic area basis that is less than nationwide, *i.e.,* an EA and CMA basis. To prevent licensees that operate systems along common geographic borders from causing harmful interference to one another, the Commission must provide operating limits to ensure such licensees do not cause interference to co-channel systems. Adopting a boundary limit approach establishes a default standard, which will enable licensees to deploy facilities in boundary areas without the need for prior coordination. (Licensees may use this operating limit as a starting point for negotiations to exceed the limits with agreement of adjacent area licensees.) Moreover, in other bands where spectrum has been allocated for fixed and mobile services, similar to AWS–3, the Commission has uniformly adopted the boundary limit method to minimize harmful co-channel interference. For instance, the PCS, AWS–1, AWS–4 and H-Block bands all use a boundary limit approach. In response to the Commission's proposal, no commenter supported a coordination requirement rather than the boundary limit approach. Consequently, we find that a boundary limit approach is the best method to address potential harmful co-channel interference between licensees operating in adjacent geographic regions.

93. We set the field strength limit at the boundary at 47 dBμV/m. As the Commission observed in the *AWS–3 NPRM,* in other bands where spectrum has been allocated for fixed and mobile services and licensed for flexible use, similar to AWS–3, the Commission has generally adopted a boundary field strength limit of 47 dBμV/m. For example, in the PCS, AWS–1, AWS–4 and H-Block bands, the Commission adopted a field strength limit of 47 dBμV/m at the boundary of licensed geographic areas. Because this limit has worked well in limiting co-channel interference in other bands, we find it appropriate to adopt it here for the similarly situated AWS–3.

94. In adopting this boundary limit, we decline to adopt the alternative limit proposed by T-Mobile. While supporting the boundary limit approach used in other bands, T-Mobile asserted that we should modify the boundary limit to set a reference measurement bandwidth, as proposed by Sprint in WT Docket No. 12–357. In making this recommendation, T-Mobile claimed that because today's LTE transmissions operate on wider channels than earlier legacy technologies, a 47 dBμV/m limit will effectively result in a comparatively

lower field strength limit. Specifically, T-Mobile proposed to adjust the field strength limit from 47 dBμV/m to 54 dBμV/m per megahertz ''which is based on GSM technology and provides a 7 dB increase over today's rules.''

95. Although we agree with T-Mobile that a boundary limit that adjusts for large differences in channel bandwidths may be appropriate, we are not persuaded that either Sprint or T-Mobile's proposed limit represents the most appropriate solution. Sprint derived the value for the field strength based on a comparison against a 30 kHz Digital Amps signal, and T-Mobile did not explain how it derived its proposed limit. Other technologies may be a more appropriate reference upon which to base the value for the field strength. Also, there are other metrics that may be used to limit the signal at the boundary, such as power flux density. We observe that the Commission has already adopted a bandwidth-independent approach when setting boundary limits with Canada and Mexico. For example, certain international limits are expressed as a power flux density (*i.e.,* dBW/m²/MHz), a measure of power, whereas field strength is a measurement of voltage. As Sprint noted, other parties have proposed to set boundary limits in a bandwidth neutral manner, but there is no established consensus on what the value of the limit should be. With no consensus regarding an alternative boundary limit approach, we are not prepared to adopt any particular approach at this time. We intend to explore the issue of whether to apply a measurement bandwidth to co-channel boundary limits in future service rules proceedings, and we encourage all interested parties to explore this issue in such proceedings to develop a full record of the technical concerns and ramifications of such an approach.

96. Finally, we adopt the Commission's proposal that adjacent affected area licensees may voluntarily agree upon higher field strength boundary levels than the 47 dBμV/m we adopt above. This concept is already codified in the field strength rules for both PCS and AWS services. No party opposed extending this approach to AWS–3. Accordingly, to maintain consistency with the PCS and other AWS bands, we permit adjacent area licensees to agree to a higher field strength limit.

5. Co-Channel Interference to BRS Channels 1 and 2

97. The AWS–1 rules include provisions that protect BRS Channel 1 (2150–2156 MHz) and Channel 2/2A (2156–2160/62 MHz) while the band transitions from BRS to AWS use. 47 CFR 27.1132, 27.1250–27.1255. These BRS provisions will expire in 2021, 15 years after the first AWS license was issued in the band, at which time any remaining BRS licensees in the band will lose primary status. *Id.* § 27.1253(a). The Commission's licensing records reflect that there are fewer than five BRS incumbents licensed on these channels and that most of the stations use Channels 1 and/or 2/2A for fixed broadband uplink. Because these BRS channels will be co-channel to some licenses in the AWS–3 downlink band at 2155–2180 MHz, the *AWS–3 NPRM* proposed that the same AWS–1 provisions in §§ 27.1132 and 27.1255 be applied to future AWS–3 licensees operating in the 2155–2180 MHz band. No parties commented on this proposal. Therefore, and in the absence of any compelling reason to do otherwise, we adopt the same provisions in §§ 27.1132 and 27.1255 for AWS–3 licensees operating in the 2155–2180 MHz band.

6. Base Station Control of Mobile or Portable Devices in 1695–1710 MHz and 1755–1780 MHz Bands

98. In the *AWS–3 NPRM,* we proposed to require mobile or portable devices operating in bands shared with Federal incumbents to be under the control of a base station. T-Mobile did not oppose this requirement, but suggested allowing an exception ''to allow devices to operate that are not under the control of a base station if that can be accomplished in a manner consistent with protection requirements to Federal operations.'' Raytheon opposed codifying T-Mobile's proposed exception, stating that such flexibility might be considered pursuant to a specific coordination scenario as long as Federal agencies are not obligated to consent to such use.

99. T-Mobile also noted that any control requirement should be consistent with LTE mobile operations, which it described as follows:

> Prior to transmitting, LTE user devices listen for system information being broadcast by the base station. Based on the system information, the user device will transmit a RACH (Random Access Channel), in order to get the cell to grant downlink/uplink radio resources. Because the mobile device does not transmit until receiving system information from the base station, the mobile device is clearly under the control of the base station. . . .

100. As discussed above, in order to facilitate Federal coordination, uplink/mobile devices in the 1695–1710 MHz and 1755–1780 MHz bands must be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations. We agree with T-Mobile that LTE user devices operating as T-Mobile describes would meet this control requirement. However, we are not persuaded to codify the general exception that T-Mobile suggests, because the proposal lacks the specificity necessary to assure us that it would prevent interference to Federal incumbents.

7. Receiver Performance

101. The *AWS–3 NPRM* sought comment on the potential for AWS–3 operations to cause receiver overload or other interference to non-AWS operations below 1695 MHz, above 1780 MHz, above 2025 MHz, and above 2180 MHz. No commenter addressed this issue directly, and the only comments suggesting the possibility of interference to adjacent non-AWS services were those urging special OOBE protection below 1695 MHz. We have addressed these comments in connection with finalizing the AWS–3 OOBE limits, and no interference issues remain to be considered.

8. Compliance With Industry Standard

102. In response to the Commission's request for comment on any other technical rules that may be required, some commenters encouraged us to mandate use of the LTE air interface standard in the AWS–3 spectrum, while some urged us to adopt an equipment interoperability requirement. In the *AWS–3 NPRM,* the Commission acknowledged that CSMAC made technical assumptions about commercial operations that assumed baseline LTE uplink characteristics and that some technical rules must accommodate CSMAC's assumptions or the Protection Zones might have to be redrawn. But the Commission emphasized that it was not proposing rules to require AWS–3 licensees to comply with any particular industry standard such as LTE. Rather, in accordance with the Spectrum Act, the Commission intended to propose flexible use service rules for the AWS–3 band. The Commission also observed that similar commercial mobile services such as PCS, AWS–1, and the 700 MHz band deploy handsets using a variety of technologies, including CDMA and UMTS, as well as LTE. AIA expressed concern ''[w]hether spectrum sharing and coordination rules can be established when there is currently no proposed requirement for AWS–3 licensees to comply with any particular industry standard such as LTE.'' And as noted above, Raytheon argued that if the Commission did not

mandate use of the LTE standard, it should ''establish *larger* Protection Zones to create an umbrella allowing for the use of other standards.'' T-Mobile disagreed, stating that ''While LTE is currently the favored standard, it may be supplanted in the future. An LTE mandate would hamstring innovation and development and be contrary to the Commission's policy to preserve technical flexibility and refrain from imposing technical standards.''

103. We agree with T-Mobile that locking licensees into a particular technology indefinitely is not warranted. Mandating a particular industry standard such as LTE would hamstring innovation and development and be contrary to the Commission's policy to preserve technical flexibility and refrain from imposing unnecessary technical standards. Instead, we seek to adopt those minimum requirements necessary to protect against interference or effectuate other compelling public interest objectives. As discussed above, the LTE standard was used to determine Protection Zones for the 1695–1710 MHz band, but that does not require its adoption for all purposes. Where the rules that we adopt today differ from proposed rules that reflected CSMAC's assumptions, we also adopt corresponding changes to the coordination zones. As discussed below, for the 1755–1780 MHz band, the coordination requirement applies nationwide, and not just to designated Protection Zones. If in the future a licensee decides to use a technology other than LTE, the licensee will still be subject to our technical rules. If the technology complies with our rules but nonetheless poses a greater risk of interference to incumbent Federal operations, this development can be addressed as part of the required coordination process. Accordingly, we see no reason to mandate use of LTE in the AWS–3 bands.

9. Canadian and Mexican Coordination

104. In the *AWS–3 NPRM,* the Commission observed that § 27.57(c) of the rules provides that AWS–1 and AWS–4 operations are subject to international agreements with Mexico and Canada, and proposed to apply the same limitation to the AWS–3 bands. No comments were submitted on this proposal. In order to ensure efficient use of the spectrum and interference-free operations in the border areas near Canada and Mexico, the Commission routinely works with the United States Department of State and Canadian and Mexican government officials. Until such time as any adjusted agreements, as needed, between the United States, Mexico and/or Canada can be agreed to, AWS–3 operations must not cause harmful interference across the border, consistent with the terms of the agreements currently in force. The list of agreements includes the ''Protocol Concerning the Transmission and Reception of Signals from Satellites for the Provisions of Mobile-Satellite Services and Associated Feeder links in the United States of America and the United Mexican States.'' We note that further modifications of the rules might be necessary in order to comply with any future agreements with Canada and Mexico regarding the use of these bands.

10. Other Technical Issues

105. In addition to the specific technical issues addressed above, the Commission also noted several rules that apply to part 27 services generally, and proposed applying them to the AWS–3 bands as well. Specifically, the Commission proposed applying the following rule sections: 27.51 Equipment authorization, 27.52 RF safety, 27.54 Frequency stability, 27.56 Antennas structures; air navigation safety, and 27.63 Disturbance of AM broadcast station antenna patterns. The Commission reasoned that because AWS–3 will be a part 27 service, these rules should apply to all AWS–3 licensees, including those who acquire licenses through partitioning or disaggregation. No commenters opposed this proposal. Accordingly, because these rules generally apply to all part 27 services, and because, as we explain below, we find it appropriate to license the AWS–3 spectrum under our part 27 regulatory framework, we conclude that the potential benefits of our proposal would outweigh any potential costs and adopt the proposal to apply these additional part 27 rules to AWS–3 licensees. The Commission recently deleted § 27.63. Rules governing disturbance of AM broadcast station antenna patterns are now contained in subpart BB of part 1, 47 CFR 1.30000–1.30004.

C. Licensing and Operating Rules; Regulatory Issues

106. The licensing and operating rules we adopt below provide AWS–3 licensees with the flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum. In the *AWS–3 NPRM,* the Commission sought comment on the appropriate license term, criteria for renewal, and other licensing and operating rules pertaining to the AWS–3 band. In addition, the Commission sought comment on the potential impact of all of our proposals on competition. Herein, we adopt a set of service rules that set forth the license term, performance requirements, and license renewal criteria and establish secondary market transaction and permanent discontinuance rules for all AWS–3 wireless licenses. We also affirm that other rule parts that pertain generally to wireless communication services will similarly apply to AWS–3 licensees.

107. *Assignment of Licenses.* The Spectrum Act states that the Commission shall grant new initial licenses for the 1695–1710 MHz and 2155–2180 MHz bands, and 15 additional megahertz of contiguous spectrum to be identified by the Commission, through a system of competitive bidding pursuant to section 309(j) of the Communications Act. In the *AWS–3 NPRM,* the Commission proposed for all AWS–3 bands, including 1755–1780 MHz and 2020–2025 MHz, to license on a geographic area basis, which would permit the acceptance of mutually exclusive applications. As such, the Commission proposed to resolve all AWS–3 applications and assign licenses through competitive bidding consistent with our statutory mandate.

108. We adopt the Commission's proposal to assign initial licenses for the AWS–3 bands through a system of competitive bidding. Further, we adopt the Commission's proposal to license AWS–3 spectrum bands on a geographic area basis and permit the acceptance of mutually exclusive applications. AT&T, for example, agrees that the ''initial assignments, in accordance with Congress' mandate, should be through a system of competitive bidding.'' Thus, as detailed below, we adopt rules to govern the use of a competitive bidding process for licensing all AWS–3 bands, including 1755–1780 MHz and 2020–2025 MHz.

109. *Flexible Use.* In the *AWS–3 NPRM,* consistent with the Spectrum Act's mandate to license according to flexible use service rules, the Commission proposed and sought comment on service rules that permit a licensee to employ the spectrum for any non-Federal use permitted by the United States Table of Frequency Allocations, subject to the Commission's part 27 flexible use and other applicable rules (including service rules to avoid harmful interference). Part 27 licensees must also comply with other Commission rules of general applicability. *See* 47 CFR 27.3. In addition, flexible use in international border areas is subject to any existing or future international agreements. Thus, the Commission proposed that the spectrum may be used for any fixed or

mobile service that is consistent with the allocations for the band. The Commission sought comment on whether any restrictions are warranted and how such restrictions would comport with the statutory mandates of section 6401 of the Spectrum Act.

110. In accordance with the Spectrum Act's direction to license according to flexible use service rules, we will license the AWS–3 spectrum under part 27. We received no comments on this specific proposal but found general support in the record for permitting flexible use. The part 27 rules provide a broad and flexible regulatory framework for licensing spectrum, enabling the spectrum to be used for a wide variety of broadband services, thereby promoting innovation and efficient use of the spectrum.

111. *Regulatory Framework.* In the *AWS–3 NPRM,* we proposed licensing AWS–3 spectrum in accordance with the flexible regulatory framework of part 27 of our rules. We sought comment on our proposal to license the AWS–3 band under part 27's service and licensing rules, and any associated costs or benefits of doing so. We believe that our part 27 rules are consistent with the Spectrum Act's requirement for ''flexible-use service rules.''

112. We adopt the Commission's proposal to license AWS–3 spectrum in accordance with the flexible regulatory framework of part 27 of our rules. We received no comments on this issue. We note that unlike other rule parts applicable to specific services, part 27 does not prescribe a comprehensive set of licensing and operating rules for the spectrum to which it applies. Rather, for each frequency band under its umbrella, part 27 defines permissible uses and any limitations thereon, and specifies basic licensing requirements.

113. *Regulatory Status.* In the *AWS–3 NPRM,* the Commission proposed to apply the regulatory status provisions of § 27.10 of the Commission's rules to licensees in the AWS–3 band. Specifically, § 27.10 requires license applicants to identify the regulatory status of the services they intend to provide, and permits applicants and licensees to request common carrier status, non-common carrier status, private internal communications status, or a combination of these options, for authorization in a single license (or to switch between them). The Commission also proposed that if a licensee changes the service or services it offers such that its regulatory status would change, it must notify the Commission within 30 days of the change.

114. We adopt the proposal to apply § 27.10 of our rules, 47 CFR 27.10, to AWS–3 licensees. Under this flexible regulatory approach, AWS–3 licensees may provide common carrier, non-common carrier, private internal communications or any combination of these services, so long as the provision of service otherwise complies with applicable service rules. We find that this broad licensing framework is likely to achieve efficiencies in the licensing and administrative process and will provide flexibility to the marketplace, thus encouraging licensees to develop new and innovative services. Moreover, by applying this requirement to AWS–3 licensees, we will treat them the same as other part 27 licensees, all of whom are subject to this rule. Although no commenters directly address this issue, commenters do support increased regulatory flexibility generally. We conclude that this approach is in the public interest and that its benefits likely outweigh any potential costs.

115. We remind potential applicants that an election to provide service on a common carrier basis requires that the elements of common carriage be present; otherwise the applicant must choose non-common carrier status. *See* 47 U.S.C. 153(44) (''A telecommunications carrier shall be treated as a common carrier under this Act''); *see also* 47 U.S.C. 332(C)(1)(A) (''A person engaged in the provision of a service that is a commercial mobile service shall, insofar as such person is so engaged, be treated as a common carrier for purposes of this Act''). If a potential licensee is unsure of the nature of its services and whether classification as common carrier is appropriate, it may submit a petition with its application, or at any time, requesting clarification and including service descriptions for that purpose.

116. Consistent with the Commission's proposal in the *AWS–3 NPRM,* we extend to the AWS–3 band our part 27 requirement that if a licensee elects to change the service or services it offers such that its regulatory status would change; it must notify the Commission and must do so within 30 days of making the change. *See* 47 CFR 27.10(d). *See also* 47 CFR 27.66 (directing a licensee to notify the Commission if it elects to change its services such that its regulatory status would change). A change in the licensee's regulatory status will not require prior Commission authorization, provided the licensee is in compliance with the foreign ownership requirements of section 310(b) of the Communications Act that apply as a result of the change. We note, however, that a different time period (other than 30 days) may apply, as determined by the Commission, where the change results in the discontinuance, reduction, or impairment of the existing service.

117. *Foreign Ownership Reporting.* In the *AWS–3 NPRM,* the Commission observed that sections 310(a) and 310(b) of the Communications Act impose foreign ownership and citizenship requirements that restrict the issuance of licenses to certain applicants. The Commission proposed to apply § 27.12 of the Commission's rules, which implements section 310, to applicants for AWS–3 licenses. With respect to filing applications, the Commission proposed that all applicants provide the same foreign ownership information, which covers both sections 310(a) and 310(b), regardless of whether they propose to provide common carrier or non-common carrier service in the band. The Commission sought comment on this proposal, including the associated costs and benefits.

118. In order to fulfill our statutory obligations under section 310 of the Communications Act, we determine that all AWS–3 applicants and licensees shall be subject to the provisions of 47 CFR 27.12; *see also* Review of Foreign Ownership Policies for Common Carrier and Aeronautical Radio Licensees under section 310(b)(4) of the Communications Act of 1934, as amended, IB Docket No. 11–133, *Second Report and Order,* 28 FCC Rcd 5741, App. B (2013) (adopting 47 CFR 1.990–1.994, which establish the requirements and conditions for obtaining the Commission's prior approval of foreign ownership in common carrier, aeronautical en route, and aeronautical fixed radio station licensees and common carrier spectrum lessees). All such entities are subject to section 310(a), which prohibits licenses from being ''granted to or held by any foreign government or the representative thereof.'' In addition, any applicant or licensee that would provide a common carrier, aeronautical en route, or aeronautical fixed service would also be subject to the foreign ownership and citizenship requirements of section 310(b).

119. No commenters opposed (or commented on) the Commission's proposal to require all AWS–3 applicants and licensees to provide the same foreign ownership information in their filings, regardless of the type of service the licensee would provide using its authorization. We believe that applicants for this band should not be subject to different obligations in reporting their foreign ownership based on the type of service authorization requested in the application and that the benefits of a uniform approach outweigh any potential costs. Therefore, we will

require all AWS–3 applicants and licensees to provide the same foreign ownership information, which covers both sections 310(a) and 310(b), regardless of which service they propose to provide in the band. We expect, however, that we would be unlikely to deny a license to an applicant requesting to provide services exclusively that are not subject to section 310(b), solely because its foreign ownership would disqualify it from receiving a license if the applicant had applied for authority to provide section 310(b) services. However, if any such licensee later desires to provide any services that are subject to the restrictions in section 310(b), we would require that licensee to apply to the Commission for an amended license, and we would consider issues related to foreign ownership at that time.

120. *Eligibility.* In the *AWS–3 NPRM,* the Commission proposed to adopt an open eligibility standard for the AWS–3 band. The Commission explained that opening the AWS–3 band to as wide a range of licensees as possible would encourage efforts to develop new technologies, products, and services, while helping to ensure efficient use of this spectrum.

121. The Commission also explained that section 6004 of the Spectrum Act restricts participation in auctions required under the Spectrum Act by ''person[s] who [have] been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant.'' The Commission noted that, in the *Incentive Auctions NPRM* and in the *H Block NPRM,* it had sought comment on whether section 6004 permits or requires the Commission to restrict eligibility of persons acquiring licenses on the secondary market, whether and to what extent such a restriction is consistent with other provisions of the Communications Act, and what procedures and rules, if any, should apply to persons acquiring licenses on the secondary market. In the *H Block R&O,* the Commission adopted an eligibility rule providing that ''[a] person described in 47 U.S.C. 1404(c) is ineligible to hold a license that is required by 47 U.S.C. Chapter 13 (Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112–96, 125 Stat. 156 (2012)) to be assigned by a system of competitive bidding under section 309(j) of the Communications Act, 47 U.S.C. 309(j).'' *AWS–3 NPRM,* 28 FCC Rcd at 11527 para. 121 n.285 citing *H Block R&O* at App. A; *see also* 47 CFR 27.12(b). In the *H Block R&O,* the Commission also adopted an amendment to its rules to implement section 6004 by adding a national security certification to the application to participate in competitive bidding. *See* 47 CFR 1.2105(a)(2)(xii). The Commission noted that this revised restriction will govern most of the AWS–3 spectrum and that, until appropriate application forms are revised, applicants for spectrum subject to section 6004 will be required to include a certification as an attachment to the application and for applicants that are not individuals, the same attribution standards that were adopted for short-form applications will apply. One commenter, Mobile Future, addressed the larger issue of the open eligibility proposal by commenting that it supports such an approach.

122. We find that nothing in the record demonstrates that we should adopt restrictions on open eligibility. Therefore, we find that open eligibility for the AWS–3 band is consistent with our statutory mandate to promote the development and rapid deployment of new technologies, products, and services; economic opportunity and competition; and the efficient and intensive use of the electromagnetic spectrum. *See* 47 U.S.C. 309(j)(3)(A), (B), & (D). We note, however, that applicants for AWS–3 licenses must comply with any licensing qualifications required by statute or rule. We conclude, based on the record before us, that the potential benefits of open eligibility for the AWS–3 band outweigh any potential costs.

123. Section 27.12(b) of the Commission's rules provides that ''[a] person described in 47 U.S.C. 1404(c) is ineligible to hold a license that is required by 47 U.S.C. Chapter 13 (Middle Class Tax Relief and Job Creation Act of 2012, Public Law 112–96, 125 Stat. 156 (2012)) to be assigned by a system of competitive bidding under section 309(j) of the Communications Act, 47 U.S.C. 309(j).'' We conclude that this provision governs the 1695–1710 MHz band, the 1755–1780 MHz band and the 2155–2180 MHz band as explained in the *AWS–3 NPRM.* Because we are pairing 1755–1780 MHz (15 megahertz of which we have identified as the ''additional fifteen megahertz of contiguous spectrum'' under the Spectrum Act) with 2155–2180 MHz (all of which is subject to the Spectrum Act), we will treat all 50 megahertz as subject to the statutory restriction.

124. *Mobile Spectrum Holding Policies.* Spectrum is an essential input for the provision of mobile wireless services, and ensuring access to and the availability of sufficient spectrum is crucial to promoting the competition that drives innovation and investment. Section 309(j)(3)(B) of the Communications Act provides that, in designing systems of competitive bidding, the Commission shall ''promot[e] economic opportunity and competition and ensur[e] that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses.'' Section 6404 of the Spectrum Act amends section 309(j) to bar the Commission from ''prevent[ing] a person from participating in a system of competitive bidding'' thereunder if such person satisfies specified qualifications criteria. However, that provision does not affect any authority the Commission has ''to adopt and enforce rules of general applicability, including rules concerning spectrum aggregation that promote competition.'' In September 2012, the Commission initiated a proceeding to review the mobile spectrum holdings policies that currently apply to both secondary market transactions and competitive bidding. The Commission indicated that, during the pendency of this proceeding, the Commission will continue to apply its current case-by-case approach to evaluate mobile spectrum holdings during its consideration of secondary market transactions and initial spectrum licensing after auctions.

125. In the *AWS–3 NPRM,* the Commission sought comment on whether and how to address mobile spectrum holding issues to meet our statutory requirements pursuant to section 309(j)(3)(B) and Section 6404 of the Spectrum Act and our goals for the AWS–3 band. The Commission also asked whether the acquisition of each of the AWS–3 spectrum bands should be subject to the same general mobile spectrum holding policies applicable to frequency bands that the Commission has found to be suitable and available for the provision of mobile telephony/broadband services. Alternatively, it sought comment on whether there were any reasons to distinguish AWS–3 spectrum for purposes of evaluating mobile spectrum holdings. It asked commenters to discuss and quantify any costs and benefits associated with any proposals.

126. USCC supports adopting a 25 percent limit on the amount of AWS–3 spectrum any one auction participant may acquire in a single market to promote competition and diversity of license holders in the band, which USCC asserts would encourage interoperability and roaming opportunities. Mobile Future and

Verizon Wireless oppose any auction-specific limits for the AWS–3 band. In particular, Verizon Wireless opposes USCC's proposal, claiming that USCC's proposed spectrum limit is unnecessary to prevent a lack of interoperability. CCA, RWA, Mobile Future, T-Mobile, Sprint, and Verizon Wireless encourage the Commission to conclude its *Mobile Spectrum Holdings* rulemaking prior to making a determination on mobile spectrum holdings policies with regard to the AWS–3 bands.

127. We observe that parties commenting on spectrum holdings issues in the AWS–3 rulemaking have raised issues with broader applicability to the *Mobile Spectrum Holdings* rulemaking, in addition to issues that relate to the characteristics of the AWS–3 bands. Given that we anticipate taking action in the *Mobile Spectrum Holdings* rulemaking well in advance of the AWS–3 auction, we find that rulemaking to be the most appropriate context in which to resolve whether any mobile spectrum holdings policies should apply to the upcoming AWS–3 auction and whether the AWS–3 bands should be included in the input market for spectrum used in the Commission's competitive review of transactions.

128. *License Term, Performance Requirements, Renewal Criteria, Permanent Discontinuance of Operations. License Term:* In the *AWS–3 NPRM,* the Commission proposed to establish a 10-year term for licenses for the AWS–3 band. The Commission noted that the Communications Act does not specify a term limit for AWS band licenses and that it has adopted 10-year license terms for most wireless radio services licenses. To maintain this consistency among wireless services, in the *H Block R&O* and the *AWS–4 Service Rules R&O,* the Commission adopted 10-year license terms. In addition, the Commission proposed that, if an AWS–3 license is partitioned or disaggregated, any partitionee or disaggregatee would be authorized to hold its license for the remainder of the partitioner's or disaggregator's original license term. ''Partitioning'' is the assignment of geographic portions of a license along geopolitical or other boundaries. ''Disaggregation'' is the assignment of discrete portions of ''blocks'' of spectrum licensed to a geographic licensee or qualifying entity. Disaggregation allows for multiple transmitters in the same geographic area operated by different companies on adjacent frequencies (thus increasing the possibility of harmful interference). The Commission sought comment on these proposals, including the associated costs and benefits.

129. We adopt an initial license term for AWS–3 spectrum rights of 12 years and subsequent renewal terms of 10 years and we modify § 27.13 of the Commission's rules to reflect these determinations. The Communications Act does not require a specific term for non-broadcast spectrum licenses. The Commission has typically adopted 10-year license terms for part 27 services, but has also found, as in the case of AWS–1 licenses, a longer initial term to be in the public interest. We find that this approach is in the public interest and find that its benefits outweigh any potential costs. Further, commenters generally support at least a 10-year license term. Given the complexities and timing of clearing government operations in the AWS–3 bands, we agree with AT&T and USCC that a longer initial license term is appropriate.

130. We decline, however, to adopt proposals by AT&T and USCC that the Commission consider 15-year initial license term. We believe instead that a 12-year initial term adequately compensates for the transition of government operations, and a 15-year initial term would be unnecessarily long. Further, wireless licensees receive their licenses not at auction completion, but after a period of time following the close of the auction to allow for license applications to be filed, processed, and reviewed to ensure the applicant meets the applicable qualifications to hold a wireless license. Nevertheless, we direct the Wireless Telecommunications Bureau to solicit comment in the third year following the initial licensing of AWS–3 spectrum for the purpose of making a recommendation to the Commission about whether an extension of the initial license term (and associated build-out deadlines) by up to 3 years is warranted in light of the status of government relocation. We agree with AT&T that the initial license term should match any adjustments extending the final build-out benchmarks.

131. We adopt the Commission's proposal that, if an AWS–3 license is partitioned or disaggregated, any partitionee or disaggregatee would be authorized to hold its license for the remainder of the partitioner's or disaggregator's original license term. No commenter addressed this proposal. We note, however, that this approach is similar to the partitioning and disaggregation provisions that the Commission adopted for BRS, for broadband PCS, for the 700 MHz band, and for AWS–1 licenses at 1710–1755 MHz and 2110–2155 MHz, and AWS–4. We emphasize that nothing in our action is intended to enable a licensee, by partitioning or disaggregating the license, to confer greater rights than it was awarded under the terms of its license grant. Similarly, nothing in this action is intended to enable any partitionee or disaggregatee to obtain rights in excess of those previously possessed by the underlying licensee.

132. *Performance Requirements:* In the *AWS–3 NPRM,* the Commission proposed to adopt specific, quantifiable performance requirements for AWS–3 licensees to ensure that licensees begin providing service to consumers in a timely manner. In the *AWS–3 NPRM,* the Commission proposed to measure build-out progress using a population-based benchmark within each license area, and sought comment on whether it should adopt an interim benchmark, an end-of-term benchmark, or other requirements. In addition, in the *AWS–3 NPRM,* the Commission sought comment on appropriate performance benchmarks for any AWS–3 uplink spectrum paired with downlink spectrum in a band other than AWS–3 and for areas where Federal use limits or prohibits AWS–3 use. Further, the Commission sought comment on whether performance requirements are necessary for service areas within the Gulf of Mexico. Along with performance benchmarks, the Commission noted that there must be meaningful and enforceable consequences, or penalties, for failing to meet construction requirements. Toward that end, the Commission also sought comment on a number of different penalties, seeking input on which set of incentives would most effectively ensure timely build-out in this band.

133. We establish performance requirements to promote the productive use of spectrum, to encourage licensees to provide service to customers in a timely manner, and to promote the provision of innovative services in unserved areas, particularly rural ones. Over the years, the Commission has tailored performance and construction requirements with an eye to the unique characteristics of individual frequency bands and the types of services expected, among other factors. Our goal is to ensure that timely and robust build-out occurs in these bands and, for the reasons discussed below, we believe that concrete interim and final build-out benchmarks will best facilitate meeting this goal. The performance requirements we establish for the AWS–3 band are consistent with those the Commission has adopted in recent items for other spectrum bands, while taking into account certain exceptional circumstances related to the timing for

the transition of this spectrum from government use to wireless use. As noted below in the Partitioning and Disaggregation section, the performance requirements we adopt also apply to disaggregated spectrum or partitioned geographic service areas. These requirements will ensure that the AWS–3 spectrum is put to use expeditiously while providing licensees with flexibility to deploy services according to their business plans. Specifically, we require:

- *AWS–3 Interim Build-out Requirement:* Within six (6) years of an initial grant, licensee shall provide reliable signal coverage and offer service to at least forty (40) percent of the population in each of its license areas.
- *AWS–3 Final Build-out Requirement:* By the end of the initial license term, *i.e.,* within twelve (12) years, a licensee shall provide reliable signal coverage and offer service to at least seventy-five (75) percent of the population in each of its license areas.

134. Additionally, we adopt the following penalties for failing to meet the build-out benchmarks:

- *Failure to meet AWS–3 band interim build-out requirement:* In the event a licensee fails to meet the AWS–3 Interim Build-out Requirement in its license area, the final build-out requirement and initial license term shall be accelerated by 2 years (from 12 to 10).
- *Failure to meet AWS–3 band final build-out requirement:* In the event a licensee fails to meet the AWS–3 Final Build-out Requirement for any licensed area, the license for each licensed area in which it fails to meet the build-out requirement shall terminate automatically without Commission action.

135. Based on the record before us, we find that these performance requirements are in the public interest and that the benefits of these requirements outweigh any potential costs. We explain below the rationale for these performance requirements, and the attendant penalties for failure to comply. We also discuss below how we will measure build-out in the Gulf of Mexico.

136. *Population-based benchmark, [per license area].* Supported by a number of comments in the record, we adopt the proposal to use objective, population-based interim and final construction benchmarks, which will be measured per license area. Requiring AWS–3 licensees to meet these performance benchmarks will promote rapid deployment of new broadband services to the American public, and at the same time provide licensees with certainty regarding their construction obligations. We agree with Verizon that, for this spectrum band, measuring build-out by percentage of population served ''will ensure that licensees provide wireless broadband services where customers actually will use them and need them.'' Further, Blooston Rural Carriers argues that population-based AWS–3 construction requirements are appropriate for CMA license areas.

137. We are not persuaded by arguments that our build-out requirements must be geography-based, or include a geographic component, in order to ensure that less densely populated, often rural, communities have timely access to the most advanced mobile broadband services. We agree that it is important to promote rapid broadband deployment in rural areas. In fact, section 309(j)(4)(B) of the Act requires that the Commission ''include performance requirements, such as appropriate deadlines and penalties for performance failures, to ensure prompt delivery of service to rural areas.'' We find that adopting relatively small, CMA and EA-based license areas, and requiring licensees to meet challenging population-based benchmarks in each individual license area separately, strikes an appropriate balance between providing flexibility to AWS–3 band licensees to deploy their networks in a cost-effective manner and assertively promoting deployment of service to less densely populated areas. We note that nothing about our decision to require population-based benchmarks in this band would foreclose our ability to impose geographic-based benchmarks in other spectrum bands that may warrant different considerations. For example, we observe that the Commission established geographic-based performance requirements for the 700 MHz B Block in light of technical characteristics and the CMA geographic license area size specific to that band.

138. Further, we reject Verizon's request that we measure compliance with the interim benchmark in the aggregate, *i.e.,* by summing the population of all of a licensees' authorizations for AWS–3 spectrum. Creating benchmarks on a per-license basis, rather than in the aggregate, is consistent with our build-out requirements in other, similar spectrum bands. Further, this approach allows for more flexibility and certainty in licensing. In addition, measuring benchmarks on a per-license basis is consistent with our determination to license service on a geographic basis and hold a licensee accountable for meeting performance obligations for all of the licenses (including partitioned licenses) that it holds. For example, should a licensee partition some of its AWS–3 spectrum, a percentage-based approach would apply to each partitioned license. In contrast, it is not clear how the responsibility for meeting benchmarks for partitioned and disaggregated licenses would be handled under Verizon's proposal.

139. *Areas unavailable due to Federal relocation and coordination requirements.* A number of commenters argue that the population of an area in which AWS–3 operations are prohibited to protect government operations should be excluded when determining whether a licensee has met its build-out requirements. We find that this scenario is best addressed by the extended interim and final construction benchmarks because we believe that applying the same performance requirements to all AWS–3 licensees will help ensure that licensees build out their entire licensed service areas. We also generally agree that if a licensee demonstrates that it is unable to meet a coverage requirement due to circumstances beyond its control, an extension of the coverage period might be warranted.

140. *Interim Benchmark.* We find that requiring an interim milestone is supported by the record, serves the public interest, and is similar to our approach in other, similar spectrum bands. A 40 percent build-out per license area benchmark is consistent with the interim benchmarks established in other bands and with various proposals suggested by commenters. For instance, Verizon proposes adopting a build-out requirement of 40 percent of the population within 4 years. Blooston Rural Carriers also supports the Commission's proposed interim benchmark, but only if the Commission licenses the AWS–3 spectrum according to CMAs.

141. Several commenters argue that the FCC should start the build-out period on a date certain that is after the final transition date for government operations. We decline to do so. Instead, we set the interim build-out benchmark 6 years from the grant of the license, which should adequately account for the period of time it will take for Federal users to relocate out of the bands being reallocated for commercial use. Further, setting a date certain that is tied to initial grant of the AWS–3 band license will provide greater certainty to AWS–3 band licensees, their investors, and other interested parties. This does not mean, however, that an AWS–3 band licensee must wait

for the all Federal users to relocate; an AWS–3 licensee can begin operating in a specific license area after successful coordination and as soon as it is confirmed that the Federal users have fully relocated out of that particular license area based on their projected transition timelines.

142. We reject the proposal of commenters who advocate a ''substantial service'' standard as the only gauge of performance. Our purpose is to ensure that timely and robust build-out occurs in this band and for the reasons enumerated above, we believe that concrete interim and final build-out benchmarks best advance this goal. Further, we note that in recent Commission decisions, the Commission has replaced the substantial service standard with specific interim and final build-out requirements.

143. *Evaluation of reliable signal coverage and service offering for unpaired, uplink only licenses at 1695–1710 MHz.* As discussed above, the 1695–1710 MHz band is low-power, uplink-only spectrum and must be paired with base stations. For the Commission to determine whether the 1695–1710 MHz band licensee is meeting its performance benchmarks, the 1695–1710 MHz band licensee must pair this uplink spectrum with downlink spectrum. Once the licensee's base stations are built or modified to control and receive 1695–1710 MHz uplinks, the reliable signal coverage of such base stations (in bands paired with 1695–1710 MHz) will determine the percentage of the population served in the licensed area of the 1695–1710 MHz uplinks, assuming that the licensee is offering service that includes UE that transmits in the 1695–1710 MHz band. Any base station to be built or modified that is located in a Protection Zone must be successfully coordinated with Federal incumbents prior to enabling/serving uplink devices that transmit in the 1695–1710 MHz. The 1695–1710 MHz licensee must show that it is complying with the build-out requirements applicable to all AWS–3 licensees, in addition to separately meeting the performance obligations for any spectrum bands paired with the 1695–1710 MHz spectrum. If the 1695–1700 MHz licensee fails to meet a benchmark, it will be subject to penalties discussed herein. However, failure to meet an AWS–3 band benchmark would not affect the downlink side of the pair, assuming that the licensee was complying with the performance obligations for that downlink spectrum.

144. *Penalty for failure to meet the interim benchmark.* Commenters generally support the Commission's proposal to assess a penalty on licensees that fail to meet the interim construction benchmark. Therefore, like similar spectrum bands, we accelerate by 2 years the time frame to complete build-out and the length of the license term. Because the initial license term is 12 years, if a licensee fails to meet the interim benchmark, it must complete its final build-out requirement within 10 years, when its license term also expires.

145. *Final Benchmark.* Within 12 years of the initial grant (or 10 years if the interim benchmark is not met), a licensee shall provide reliable coverage and offer wireless service to at least 75 percent of the population in each of its license areas. Commenters generally support the Commission's approach. Establishing a final build-out benchmark that coincides with the end of the initial license term is consistent with how the Commission has formulated performance requirements in other spectrum bands. Because we have set the interim benchmark at 6 years and we have created a 12-year initial license term, we find Verizon's suggestion that we establish a 7-year final build-out requirement to be unduly accelerated and we therefore decline to adopt it. Under the circumstances, a 12-year construction milestone provides a reasonable timeframe for a licensee to deploy its network and offer widespread service, provided it meets its interim benchmark. Licensees that do not meet the 6-year interim benchmark must accelerate their final build out by 2 years to meet the final benchmark by the end of their shortened, 10-year license term.

146. *Penalty for failure to meet the final benchmark.* Where a licensee fails to meet the final build-out requirement in any EA or CMA, its authorization for each EA or CMA in which it fails to meet the requirement shall terminate automatically without further Commission action. Automatic termination is a common remedy for failure to build part 27 flexible use licenses and is the approach adopted by the Commission in the *AWS–4 Report and Order* and the *H Block Report and Order.* By terminating only the specific licenses where a licensee fails to meet the final benchmark, we will not directly affect a licensee's customers in other license areas. We decline to adopt ''keep-what-you-use'' as a penalty for failure to meet construction requirements as some commenters suggest, because these proposals may encourage less robust build-out by a licensee that decides not to fully build out to the final benchmark.

147. As a general matter, we expect that AWS–3 band licensees will meet the performance requirements because of the serious consequences associated with non-compliance, including automatic license cancellation. Further, we expect that licensees' deployment will generally exceed the levels set forth in the benchmarks, and that these build-out requirements generally represent a floor—not a ceiling. As for USCC's assertion that automatic termination is too punitive, the Commission has explained in the past that we do not consider automatic termination to be overly punitive or unfair, particularly given that the Commission has applied this approach to nearly all geographically-licensed wireless services. Further, the Commission has rejected the argument, and we do so again here, that an automatic termination penalty would deter capital investment, observing that the wireless industry has invested billions of dollars and has flourished under this paradigm in other spectrum bands. For the same reason, we believe that an automatic termination penalty will have little effect on auction participation, as suggested by USCC. Finally, we do not agree with USCC that automatic termination harms the public because, even if a customer loses service from a provider when it loses spectrum rights for a particular EA or CMA, alternative providers may be available. We also expect that a future licensee for that EA or CMA may ultimately be able to serve more customers.

148. In the event a licensee's authority to operate terminates, the licensee's spectrum rights would become available for reassignment pursuant to the competitive bidding provisions of section 309(j). Further, consistent with the Commission's rules for other part 27 spectrum bands, including AWS–1, AWS–4, and H Block, any AWS–3 licensee who forfeits its license for failure to meet its performance requirements would be precluded from regaining the license. Therefore, we reject Verizon's ''new applicant'' proposal that would effectively provide a mechanism for a licensee who failed to meet the final build-out requirement to continue to hold onto its fallow spectrum unless a competing bidder emerged.

149. *Gulf of Mexico.* Having received no comments on the Gulf of Mexico performance requirements, and recognizing that we are licensing wireless service in the Gulf (as EA 176), we adopt the same coverage requirements as set forth above. We note one exception, however: we will calculate ''population'' pursuant to the

approach taken in *Small Ventures Memorandum Opinion and Order.* In that order, the Wireless Bureau recognized that using the conventional Census tract methodology for determining population in the Gulf of Mexico would be infeasible because the EAs in the Gulf consist of a body of water with non-permanent, mobile residents. Consistent with that order, we allow a Gulf of Mexico licensee to use all off-shore platforms, including production, manifold, compression, pumping and valving platforms as a proxy for population in the Gulf of Mexico for purposes of meeting build-out obligations. Thus, in lieu of measuring its build-out obligations based on population, a licensee serving the Gulf of Mexico shall within six (6) years provide reliable coverage and offer wireless service to at least forty (40) percent of all off-shore platforms in its license areas and within 12 years (or at the end of the license term), provide reliable coverage and offer wireless service to at least 75 percent of all off-shore platforms in its license area in the Gulf of Mexico. If a licensee fails to meet the interim benchmark, the final benchmark and initial license term are accelerated by 2 years—from 12 to 10 years. All penalties and other compliance procedures adopted herein, excluding those in paragraph 152 below discussing the methodology for meeting population-based build-out requirements shall apply to a Gulf of Mexico licensee.

150. *Compliance Procedures.* Finding the proposed compliance procedures to be in the public interest and having received no comments on the issue, we adopt the proposal in the *AWS–3 NPRM* to require AWS–3 licensees to comply with § 1.946(d) of our rules. Specifically, this rule requires that licensees must demonstrate compliance with their performance requirements by filing a construction notification within 15 days of the relevant milestone certifying that they have met the applicable performance benchmark. Additionally, consistent with the *AWS–4 Report & Order* and the *H Block R&O,* we require that each construction notification include electronic coverage maps and supporting documentation, which must be truthful and accurate and must not omit material information that is necessary for the Commission to determine compliance with its performance requirements.

151. Electronic coverage maps must accurately depict the boundaries of each license area in the licensee's service territory. If a licensee does not provide reliable signal coverage to an entire CMA or EA, as applicable, its map must accurately depict the boundaries of the area or areas within each CMA or EA, as applicable, not being served. Each licensee also must file supporting documentation certifying the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology.

152. The licensee must use the most recently available decennial U.S. Census Data at the time of measurement to meet the population-based build out requirements. Specifically, a licensee must base its claims of population served on areas no larger than the Census Tract level. The Census Bureau defines Census Tracts as ''small, relatively permanent statistical subdivisions of a county delineated by local participants as part of the U.S. Census Bureau's Participant Statistical Areas Program . . . [T]he entire United States is covered by census tracts.'' This requirement tracks the Commission's action requiring broadband service providers to report ''snapshots'' of broadband service at the Census Tract level twice each year by completing FCC Form 477.

153. *Renewal Criteria:* Section 308(b) of the Communications Act authorizes the Commission to require renewal applicants to ''set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical, and other qualifications of the applicant to operate the station[,]'' as well as ''such other information as it may require.'' In the *AWS–3 NPRM,* the Commission proposed to adopt license renewal requirements consistent with those adopted in the *700 MHz First Report and Order,* the *AWS–4 Report and Order,* and the *H Block R&O.* Under those requirements, renewal applicants must file a ''renewal showing,'' in which they demonstrate that they have been and are continuing to provide service to the public, and are compliant with the Communications Act and with the Commission's rules and policies. In the *AWS–3 NPRM,* we proposed to apply to AWS–3 licensees the same renewal showing requirement recently adopted in the *H Block R&O.*

154. In the *AWS–3 NPRM,* the Commission sought comment on whether AWS–3 band licensees should be awarded renewal expectancies if they meet their performance obligations and otherwise comply with the Commission's rules and policies and the Communications Act throughout their license term. The Commission also inquired whether licensees should receive a renewal expectancy for subsequent license terms if they continue to provide at least the level of service demonstrated at the final performance benchmark through the end of any subsequent license terms. Finally, the Commission proposed that, consistent with its 700 MHz licensing paradigm, it would prohibit the filing of competing license renewal applications, and that if a license is not renewed, the associated spectrum would be returned to the Commission for assignment.

155. Pursuant to section 308(b) of the Communications Act, we will require AWS–3 band licensees seeking license renewal to file renewal applications; below, we specify the information that renewal applicants must provide to enable the Commission to assess whether renewal is warranted and in the public interest. Where a license is not renewed, the associated spectrum will be returned to the Commission and made available for assignment. We will not permit the filing of competing applications against license renewal applications.

156. We apply to AWS–3 band licensees the same renewal showing requirements we recently adopted for the H Block. Specifically, an AWS–3 band licensee's renewal showing must provide a detailed description of its provision of service during the entire license period and discuss: (1) The level and quality of service provided (including the population served, the area served, the number of subscribers, and the services offered); (2) the date service commenced, whether service was ever interrupted, and the duration of any interruption or outage; (3) the extent to which service is provided to rural areas; (4) the extent to which service is provided to qualifying tribal land as defined in § 1.2110(e)(3)(i) of the Commission's rules; and (5) any other factors associated with the level of service to the public. Accordingly, we hereby modify § 27.14 of the Commission's rules to apply these renewal showing criteria to the AWS–3 bands. Nothing in our decision today prejudges or forecloses the Commission's future consideration of the policies and proposed rules, and related record, for the *WRS Renewals NPRM,* which remains pending. In addition, we emphasize that licensees seeking renewal bear the risk of future changes to our rules that may alter this renewal expectancy.

157. Based on the record before us and our analysis below, we find that the renewal requirements we establish for

AWS–3 band licensees are in the public interest and that their benefits outweigh any likely costs. In recent years, the Commission has refined its license renewal policies—beginning with the *700 MHz First Report and Order* in 2007, later in the *AWS–4 Report and Order,* and more recently in the *H Block Report and Order.* Through these actions, we have established that licensees must demonstrate that they are providing adequate levels of service over the course of their license terms, and here we act consistently with that policy. Consequently, we adopt renewal criteria for the AWS–3 band that are based on those criteria adopted in the *700 MHz First Report and Order* and that were similarly followed in the *AWS–4 Report and Order* and the *H Block Report and Order.* We believe these renewal requirements will provide licensees certainty regarding the factors that the Commission will consider during the renewal process, thereby facilitating investment decisions regarding broadband rollout. We also find that these requirements address commenters' concerns that the renewal process not unnecessarily burden licensees or deter investment.

158. In adopting these criteria, we decline to adopt at this time AT&T's proposal to categorically provide a renewal expectancy to all licensees that meet their performance requirements and comply with the Communications Act and the Commission's rules. USCC claims that renewal expectancies, based solely on performance requirements, would provide certainty to licensees and investors. As the Commission has consistently stated, performance and renewal showings are distinct; they serve different purposes and, if not met, the Commission may apply different penalties. A performance showing provides a snapshot in time of the level of a licensee's service, whereas a renewal showing provides information regarding the level and types of service provided over the course of a license term. We disagree, therefore, with AT&T's contention that there is ''no identifiable benefit'' to requiring licensees to make a renewal showing. We emphasize that where a licensee meets the applicable performance requirements, but fails to provide continuity of service (by, for example, repeatedly discontinuing operations between required performance showings for periods of less than 180 days), the Commission could find that renewal would be contrary to the public interest. We note that, in addressing broadcast license renewal proceedings, Congress has specifically established a standard that takes into consideration not only compliance with Commission rules but also whether ''the station has served the public interest, convenience, and necessity.'' Where a licensee fails to meet its interim performance requirement and becomes subject to a 2-year acceleration of both its final performance requirement and its license term, its final performance showing might merely reflect a snapshot in time of compliance with the performance requirement. By contrast, its renewal application must provide a timeline of its provision of service, the percentage of the license-area population covered, and types of service provided over the course of the license term, including any efforts to meet the interim performance requirement.

159. For subsequent license terms, licensees are likely—absent extraordinary circumstances—to obtain license renewal if they submit satisfactory showings demonstrating that they have maintained or exceeded the level of coverage and service required at the final performance benchmark (during the initial license term), and otherwise comply with the Commission's rules and policies and the Communications Act. We decline, however, to ''codify'' a renewal expectancy as USCC proposes, at this time.

160. Finally, we reject USCC's proposal that we permit competing renewal applications or, in their absence, process unopposed applications in the same manner as renewals in the cellular and PCS services. We find that the public interest would be ill-served by permitting the filing of potentially time-consuming and costly competing applications. As the Commission explained in the *700 MHz First Report and Order,* prohibiting competing applications ''protects the public interest without creating incentives for speculators to file 'strike' applications.'' *700 MHz First Report and Order,* 22 FCC Rcd at 8093 para. 76; *see also AWS–4 Report and Order,* 27 FCC Rcd at 16202 para. 272; *H Block R&O,* 28 FCC Rcd at 9568 para. 224. The renewal requirements we adopt today will provide Commission staff with ample information to determine whether license renewal would serve the public interest.

161. *Permanent Discontinuance of Operations:* In the *AWS–3 NPRM,* the Commission asked whether it should apply to AWS–3 band wireless licensees the rules governing the permanent discontinuance of operations. According to § 1.955(a)(3), an authorization will automatically terminate, without specific Commission action, if service is ''permanently discontinued.'' Consistent with the definition that the Commission adopted for the H Block and the AWS–4 band, the Commission proposed to define for the AWS–3 band ''permanently discontinued'' as a period of 180 consecutive days during which the licensee does not provide service in each of its licensed areas to at least one subscriber that is not affiliated with, controlled by, or related to, the provider. For licensees that use their licenses for private, internal communications, the Commission proposed in the *AWS–3 NPRM* to define ''permanent discontinuance'' as a period of 180 consecutive days during which the licensee does not operate. The Commission proposed that licensees would not be subject to these requirements until the date of the first performance requirement benchmark.

162. In addition, the Commission proposed that a licensee must notify the Commission within 10 days if it permanently discontinues service, by filing FCC Form 601 or 605 and requesting license cancellation, consistent with § 1.955(a)(3) of the Commission's rules. The Commission emphasized that even if a licensee fails to file the required form, however, an authorization will automatically terminate without specific Commission action if service is permanently discontinued. The Commission sought comment on these proposals, including their associated costs and benefits.

163. We adopt the Commission's proposal and determine that § 1.955(a)(3) of the Commission's rules will apply to all AWS–3 band licensees, including holders of both EAs and CMAs, and find that the benefits of applying this rule outweigh any potential costs of doing so. Thus, a licensee's authorization will automatically terminate, without specific Commission action, if service is ''permanently discontinued.'' As the Commission has previously explained, the operation of so-called channel keepers, *e.g.,* devices that transmit test signals, tones, and/or color bars, do not constitute ''operation'' under § 1.955(a)(3) or the Commission's other permanent discontinuance rules. AT&T does not object to the discontinuance proposal but asks for clarification of § 1.9030(d)(5) of the Commission's rules on long-term *de facto* transfer leasing arrangements to count a lessee's continuous service toward the underlying licensee's service obligation in order to avoid triggering the permanent discontinuance rule. Any performance or build-out requirement applicable under a license authorization always remains a condition of the

license, and the legal responsibility for meeting such obligation is not delegable to the spectrum lessee(s). An AWS–3 licensee is also accountable for any discontinuance of operation and the rules will be enforced against the licensee regardless of whether the licensee was relying on the activities of a lessee to meet particular performance requirements. However, the licensee may attribute to itself the build-out or performance activities of its spectrum lessee(s) for purposes of complying with any applicable build-out or performance requirement.

164. In accordance with our proposal, for providers that identify their regulatory status as common carrier or non-common carrier, we define ''permanently discontinued'' as a period of 180 consecutive days during which the licensee does not provide service in the individual license area (or smaller service area in the case of a partitioned license) to at least one subscriber that is not affiliated with, controlled by, or related to, the provider. We adopt a different approach for wireless licensees that use their licenses for private, internal communications, however, because such licensees generally do not provide service to unaffiliated subscribers. For such private, internal communications, we define ''permanent discontinuance'' as a period of 180 consecutive days during which the licensee does not operate. In other words, the rule that we adopt for private, internal communications does not include a requirement that the licensee provide service to an unaffiliated subscriber in order to avoid triggering the permanent discontinuance rule. A licensee will not be subject to the discontinuance rules until the date it must meet its first performance requirement benchmark, a rule which will avoid penalizing licensees that construct early, but then may shut down for 180 days before their first performance benchmark date.

165. *Secondary Markets: Partitioning and Disaggregation.* In the *AWS–3 NPRM,* the Commission proposed to permit AWS–3 band licensees to partition geographic markets and disaggregate spectrum under existing part 27 partitioning and disaggregation rules. *See* 47 CFR 27.15. A partitionee or disaggregatee is authorized to hold its license for the remainder of the partitioner's or disaggregator's license term. *See* 47 CFR 27.15(c). Specifically, it proposed that any entity holding an AWS–3 band license, including parties to any partitioning or disaggregation arrangement pertaining to an AWS–3 band license, must independently meet the applicable technical rules and regulatory requirements, including performance and renewal requirements. The Commission proposed this approach to facilitate efficient spectrum use, while enabling service providers to configure geographic area licenses and spectrum blocks to meet their operational needs.

166. We adopt the part 27 partitioning and disaggregation rules for the AWS–3 band. Very few commenters discuss partitioning and disaggregation, but those who do support this approach. Verizon agrees that the Commission ''should apply its existing part 27 geographic partitioning, disaggregation, and spectrum leasing rules to AWS–3 licensees.'' Further, permitting disaggregation and partitioning will help facilitate investment and rapid deployment in the AWS–3 band, while giving licensees flexibility to use the spectrum to meet changing market demand. As the Commission noted when it first adopted partitioning and disaggregation rules, allowing this type of flexibility can facilitate the efficient use of spectrum, and expedite provision of services in areas that might not otherwise receive service in the near term. We conclude, based on the record before us, that permitting partitioning and disaggregation is in the public interest, and the associated benefits would outweigh any potential costs.

167. As proposed in the *AWS–3 NPRM,* we require any AWS–3 band licensee that is a party to any partitioning or disaggregation arrangement (or combination of both) to independently meet the applicable technical rules and regulatory requirements, including performance and renewal requirements. As the Commission has previously observed, this approach should facilitate efficient spectrum usage and prevent the avoidance of timely construction as a result of the vagaries of the secondary market, while still providing operators with the flexibility to design their networks according to their operational and business needs. Commenters support this approach, which is consistent with our treatment of other part 27 services. For example, Verizon states that allowing licensees ''the ability to partition and/or disaggregate portions of their spectrum holdings, and/or to lease such holdings, promotes a robust secondary market in spectrum.'' We agree with Verizon that these rules have been effective and should be applied to the AWS–3 band.

168. *Spectrum Leasing.* In the *AWS–3 NPRM,* the Commission proposed to apply to AWS–3 band licensees the spectrum leasing policies established in various Secondary Market proceedings in the same manner that those policies and rules apply to other part 27 services. Since 2003, these secondary market policies and rules have enabled licensees to lease some or all of their spectrum usage rights to third party spectrum lessees, who are permitted to provide wireless services consistent with the underlying license authorization.

169. We adopt the same spectrum leasing policies and rules that apply to other part 27 services. Wireless Radio Services do not include satellite services. 47 CFR 1.907. Under these secondary market policies and rules, the service rules and policies applicable to the licensee under its license authorization—including all technical, interference, and operational rules—apply to the spectrum lessee as well. The rules and procedures for spectrum leasing arrangements are set forth in part 1, subpart X. 47 CFR 1.9001 *et seq.* Commenters that discuss spectrum leasing support the proposals made in the *AWS–3 NPRM* and agree that adopting spectrum leasing rules will promote the public interest. For example, TIA notes that ''[c]onsistency with leasing rules that apply to other terrestrial spectrum is a virtue, and helps ensure that future transactions can proceed with greater predictability and transparency.'' Our secondary markets policies are designed to promote more efficient, innovative, and dynamic use of the spectrum, expand the scope of available wireless services and devices, enhance economic opportunities for accessing spectrum, and promote competition among providers. Likewise, allowing spectrum leasing in the AWS–3 band will serve these same purposes. We also observe that ''[f]or a particular spectrum band, spectrum leasing policies generally follow the same approach as the partitioning and disaggregation policies for the band.'' Thus, our decision to permit spectrum leasing in the AWS–3 band is consistent with our determination above to permit partitioning and disaggregation of AWS–3 band spectrum.

170. *Other Operating Requirements.* In the *AWS–3 NPRM,* the Commission explained that even though we issue licenses in the AWS–3 band pursuant to one rule part (part 27), we may require licensees in this band to comply with rules contained in other parts of the Commission's rules, depending on the particular services they provide. The Commission sought comment on whether we need to modify any provisions in existing, service-specific rules to ensure that we cover AWS–3 band licensees under the necessary Commission rules. In addition, the

Commission sought comment on any rules that would be affected by the proposal to apply elements of the framework of these rule parts, whether separately or in conjunction with other requirements.

171. Although we primarily adopt rules for the AWS–3 band in part 27, in order to maintain general consistency among various wireless communication services, we also require AWS–3 licensees to comply with certain other rule parts that pertain generally to wireless communication services. No commenter opposes this approach. Section 27.3 of the Commission's rules lists some of the rule parts applicable to wireless communications service licensees. In addition, other FCC rules may apply to wireless licensees, including those that apply only to certain wireless licensees, depending on the specific type of service or services that a particular licensee provides. *See, e.g.,* 47 CFR part 9 (wireless licensees providing interconnected VoIP services are subject to E911 service requirements); *see generally,* parts 20, 22, 24, 27 and 101 for other wireless licensee obligations. We thus find it appropriate to apply § 27.3 and the rules referenced therein, as well as similar rules applicable to wireless communications service licensees, to AWS–3 band licensees. In so doing, we will maintain consistency among various wireless communications services which we find will best serve the public interest. For these same reasons, we also find that the benefits of this approach outweigh any potential costs.

172. *Facilitating Access to Spectrum and the Provision of Service to Tribal Lands.* The *AWS–3 NPRM* explained that the Commission is currently considering various provisions and policies intended to promote greater use of spectrum over Tribal lands. The Commission proposed to extend any rules and policies adopted in that proceeding to any licenses that may be issued through competitive bidding in this proceeding. The Commission sought comment on this proposal and any costs and benefits associated with it.

173. We will extend any rules and policies adopted in the Tribal Lands proceeding to any AWS–3 license that may be issued through competitive bidding. Because that proceeding is specifically focused on promoting greater use of spectrum over Tribal lands, we find that it is better suited than the instant proceeding to reach conclusions on that issue.

174. *Competitive Bidding Procedures.* As discussed above, the Spectrum Act requires the Commission to grant new initial licenses for the use of spectrum in certain specified frequency bands through a system of competitive bidding. *See* 47 U.S.C. 1451(b)(1), (2). The spectrum, as specified in the Spectrum Act, is as follows (in addition to the spectrum previously addressed in the *H Block R&O):* 2155–2180 MHz, 15 megahertz of spectrum identified by NTIA between 1675 and 1710 MHz, and 15 megahertz of contiguous spectrum to be identified by the Commission. *See* 47 U.S.C. 1451(b)(2). As noted above, NTIA identified the 1695–1710 MHz band for reallocation from Federal use to non-Federal use, and the Commission has identified the 1755–1780 MHz band in satisfaction of the Spectrum Act's requirement that it identify 15 megahertz of contiguous spectrum in addition to the bands specifically identified in the Act. We will therefore assign licenses in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands by auction. We will conduct any auction for licenses in these bands pursuant to our standard competitive bidding rules found in part 1, subpart Q of the Commission's rules and will provide bidding credits for qualifying small businesses, as proposed in the *AWS–3 NPRM.* Below we discuss our reasons for adopting the relevant proposals.

175. *Application of part 1 Competitive Bidding Rules.* The Commission proposed in the *AWS–3 NPRM* to conduct any auction for licenses in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands in conformity with the general competitive bidding rules set forth in part 1, subpart Q, of the Commission's rules, and substantially consistent with the competitive bidding procedures that have been employed in previous auctions. The *AWS–3 NPRM* also made proposals and solicited comment on applying the part 1 competitive bidding rules to the 2020–2025 MHz band. However, we will defer further consideration of this band until the downlink/uplink status of the adjacent 2000–2020 MHz band is resolved. Accordingly, we limit herein our discussion of the proposals and our decisions concerning competitive bidding procedures to the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands. Additionally, the Commission proposed to employ the part 1 rules governing competitive bidding design, designated entity preferences, unjust enrichment, application and payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants. Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its part 1 general competitive bidding rules in the future. The *AWS–3 NPRM* also sought comment on whether any part 1 rules would be inappropriate or should be modified for an auction of licenses in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands.

176. The limited comment we received generally supports the Commission's proposed use of its standard competitive bidding rules for an auction of AWS–3 band licenses. Verizon Wireless asks the Commission to narrow the scope of § 1.2105(c)'s prohibition on certain communications by (1) confirming that the rule does not apply to unrelated routine business discussions and agreements; (2) confirming that discussions regarding generic technical handset and network issues that occur, for example, in industry standard-setting meetings or with equipment manufacturers, are not prohibited; (3) narrowing the definition of who is an ''applicant'' to exclude owners of 10% or more of the applicant entity; and (4) shortening the period during which the rule is in effect to end at the close of bidding, rather than that the down payment deadline. T-Mobile supports Verizon Wireless's request, and submits that the requested changes will not interfere with the primary purposes of the Commission's rule and will enhance competition. Sprint opposes Verizon Wireless's requested changes to the rule, and cautions against adopting any wide-reaching revisions or alterations that have the potential consequence of undermining competition. Sprint supports the Commission's consideration of the particular circumstances and competitive dynamics surrounding any particular auction in formulating appropriate competitive bidding rules, but submits that a blanket revision to the Commission's competitive bidding rules, or revisions not attuned to the particular competitive dynamics of a specific auction such as the AWS–3 auction, would not promote the public interest. While Sprint notes that the extraordinary complexity of the broadcast incentive auction might warrant revisions to facilitate participation by smaller bidders, it urges the Commission to carefully scrutinize Verizon Wireless's proposal to relax the rule for an AWS–3 auction. Other commenters express views on topics that are generally considered after the adoption of service rules, during the pre-auction process for establishing

procedures for conducting an AWS–3 auction. For example, some parties state their positions on auction design and the use of package bidding for any auction of AWS–3 spectrum, with some in favor and others opposed. *See* Verizon Wireless Comments at 16–17; TIA Comments at 14; Cellular One Comments at 1–3; USCC Comments at 36–49; USCC Reply Comments at 43–47; Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4–5. *See also* AT&T Comments at 13. Likewise, T-Mobile recommends that the Commission make certain changes to its auction procedures concerning how reserve prices, minimum opening bids, and additional bid amounts are calculated. T-Mobile Reply Comments at 25–26. Because those issues are properly considered in the context of the separate, future proceeding to establish procedures for conducting an AWS–3 auction, we will not address those comments here. *See* AT&T Reply at 13 (package bidding and other auction procedures are traditionally considered after the adoption of service rules).

177. Based on our review of the record and our prior experience with conducting auctions, we conclude that the Commission's Part 1 bidding rules should govern the conduct of any AWS–3 auction. We decline to modify the part 1 rules as Verizon Wireless requests. We disagree with Verizon Wireless's claim that the Commission has extended the restrictions in § 1.2105(c) to routine business discussions, and that such an extension has resulted in uncertainty for auction applicants as to whether discussions that are unrelated to bids or bidding strategies or to post-auction market structure could violate the rule. The plain text of the rule makes clear that business discussions and negotiations that are *unrelated* to bids or bidding strategies or to post-auction market structure are not prohibited by the rule. The rule's prohibition has always been aimed at the specific content of an applicant's communication to a competing applicant regardless of the context or situation in which such content is communicated. Conversely, if the content of an applicant's communication does not fall within the prohibition, the particular situation in which the communication occurs will not alone make it a violation. Thus, contrary to Verizon Wireless's assertion, the Commission has not extended the prohibition in § 1.2105(c), because the types of prohibited content have remained unchanged, while the potential contexts and situations in which an applicant is prohibited from communicating that content have always been undefined. Moreover, the Wireless Telecommunications Bureau (''Bureau'') has previously issued guidance explaining that, although auction applicants competing for licenses in the same geographic areas, or competing for licenses in the same areas in competing services, must affirmatively avoid all communications with each other that affect, or have the potential to affect, their bids or bidding strategy, this does not mean that all business negotiations between such applicants are prohibited. *See* Wireless Telecommunications Bureau Responds to Questions About the Local Multipoint Distribution Service Auction, *Public Notice,* DA 98–37, 13 FCC Rcd 341, 347 (1998). The public notices issued by the Bureau establishing the procedures for each auction also provide detailed guidance to auction applicants and bidders regarding section 1.2105(c), including its application to particular types of communications. We think the Bureau's guidance regarding the applicability of § 1.2105(c) provided to date is sufficiently clear and find the clarification requested by Verizon Wireless to be unnecessary.

178. Given the clarity of our rule, we likewise find it unnecessary to confirm in advance that particular types of discussions or negotiations by particular applicants are in compliance with our rule, or to establish a safe harbor for otherwise prohibited communications made by personnel that an applicant has ''walled off'' from certain other personnel. We emphasize that the specific types of communications with which Verizon Wireless expresses concern would not fall within the prohibition in § 1.2105(c) unless they divulge bids or bidding strategies or discuss or negotiate settlement agreements, arrangements or understandings of any kind relating to the licenses being auctioned, including agreements relating to the post-auction market structure. We conclude that the Bureau's past guidance regarding the applicability of § 1.2105(c) provides sufficient information to allow auction applicants to structure their routine business activities accordingly so that they do not run afoul of the rule.

179. We also decline Verizon Wireless's request to amend the prohibited communications rule in the context of this AWS–3 service rules proceeding to narrow the definition of an ''applicant'' for purposes of the rule to include only the filing entity and its controlling equity interest holders, or to shorten the period during which the rule prohibiting certain communications is in effect to end at the close of bidding. As noted above, the *AWS–3 NPRM* sought comment on whether any of our part 1 rules would be inappropriate or should be modified specifically for an auction of AWS–3 spectrum. None of the commenters who advocated revisions to the part 1 rules explained whether or how their suggestions relate specifically to, or would be particularly necessary or appropriate for, an auction of licenses in the AWS–3 bands. Given the limited record received on this topic, without more comment, we are not inclined to adopt amendments to our general competitive bidding rules in the context of adopting service-specific rules for AWS–3 spectrum.

180. *Revision to part 1 Certification Procedures.* Section 6004 of the Spectrum Act prohibits ''a person who has been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant'' from participating in a system of competitive bidding under section 309(j) required to be conducted under Title VI of the Spectrum Act. In 2013, the Commission amended its rules to implement this Spectrum Act mandate by adding a national security certification to the application to participate in competitive bidding. The Commission noted in the *AWS–3 NPRM* that it would require this additional certification from all applicants in any short-form application to participate in competitive bidding for licenses in the AWS–3 bands that are subject to the Spectrum Act. Accordingly, an AWS–3 auction applicant must certify, under penalty of perjury, that it and all of the related individuals and entities required to be disclosed on the short-form application are not persons who have ''been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant.'' As with the other certifications on the short-form application, failure to include the required certification by the applicable filing deadline would render the short-form application unacceptable for filing, and the applicant would be ineligible to participate in the auction.

181. *Small Business Provisions for Geographic Area Licenses.* As discussed in the *AWS–3 NPRM,* in authorizing the Commission to use competitive bidding, Congress mandated that the Commission ''ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services.'' In addition, section 309(j)(3)(B) of the

Communications Act provides that, in establishing eligibility criteria and bidding methodologies, the Commission shall seek to promote a number of objectives, including ''economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women.'' One of the principal means by which the Commission fulfills this mandate is through the award of bidding credits to small businesses.

182. In the *Competitive Bidding Second Memorandum Opinion and Order,* the Commission stated that it would define eligibility requirements for small businesses on a service-specific basis, taking into account the capital requirements and other characteristics of each particular service in establishing the appropriate threshold. Further, in the *Part 1 Third Report and Order,* the Commission, while standardizing many auction rules, determined that it would continue a service-by-service approach to defining the eligibility requirements for small businesses.

183. The Commission proposed in the *AWS–3 NPRM* to define a small business as an entity with average gross revenues for the preceding 3 years not exceeding $40 million, and a very small business as an entity with average gross revenues for the preceding 3 years not exceeding $15 million. Under this proposal, small businesses would be provided with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent, consistent with the standardized schedule in part 1 of our rules. This proposal was modeled on the small business size standards and associated bidding credits that the Commission adopted for the AWS–1 band, based on the belief that the AWS–3 bands would be employed for purposes similar to those for which the AWS–1 band is used. The *AWS–3 NPRM* noted that these small business size standards and associated bidding credits were adopted for the AWS–1 band because of the similarities between the AWS–1 service and the broadband PCS service, and that the Commission had followed this approach when proposing small business size standards and associated bidding credits in the *2004 NPRM* and when adopting them in the *AWS–4 Service Rules R&O* and the *H Block R&O.*

184. The Commission sought comment on these proposals, including the costs or benefits of these standards and associated bidding credits, particularly as they may relate to the size of the geographic areas to be served and the spectrum allocated to each license. The Commission also specifically sought comment on whether the small business provisions it proposed are sufficient to promote participation by businesses owned by minorities and women, as well as rural telephone companies. The limited comment we received on the Commission's proposal to offer small business bidding credits in an auction for the AWS–3 bands is generally supportive. The *AWS–3 NPRM* also proposed to extend any rules and policies adopted in the Commission's Tribal lands proceeding to any assignment of licenses in the AWS–3 bands through competitive bidding; *see also Tribal Lands NPRM,* 26 FCC Rcd at 2630–31 paras. 19–20 (2011). No commenter addressed this proposal, and we see no reason to depart from our proposed approach here.

185. Blooston Rural Carriers support the Commission's proposed small business bidding credits, but ask the Commission to consider offering additional support to incumbent rural carriers in the AWS–3 auction through an additional (cumulative) bidding credit of 15 percent for entities that qualify as a ''rural telephone company'' or that are a subsidiary or affiliate of a qualified rural telephone company under the Commission's rules. This bidding credit would be available in addition to any other bidding credit for which an applicant may be eligible, but the credit would be limited to licenses that cover all or part of the rural carrier's certificated wireline service area. Blooston Rural Carriers submit that such an additional bidding credit would effectively help companies compete with large regional and wireless carriers in their local service territory and with carriers bidding more densely populated areas. The Commission has previously considered proposals to create an additional rural telephone company bidding credit. In declining to adopt such past proposals, the Commission observed that proponents of this type of credit had been unable ''to demonstrate a historical lack of access to capital that was the basis for according bidding credits to small businesses, minorities and women,'' and that ''[i]n subsequent decisions, large rural telcos have failed to demonstrate any barriers to capital formation similar to those faced by other designated entities.'' While the Commission has not intended to apply the part 1 bidding credit schedule uniformly to all services without any opportunity for the consideration of alternative bidding credits, the schedule of size standards and bidding credits described in our part 1 rules provides small businesses with consistency and predictability and we are not persuaded that we should deviate from that schedule here. As discussed above, the Commission took the characteristics of the AWS–3 service into consideration when proposing the two size standards and associated bidding credits in the *AWS–3 NPRM.* Based on the record in this proceeding, we decline to adopt a bidding credit for incumbent rural carriers in addition to the small business bidding credits that we adopt for the AWS–3 bands.

186. CCA also supports the Commission's proposal to offer small business bidding credits, but asks the Commission to amend its bidding credit provisions to better fulfill the purposes of section 309 of the Communications Act. CCA asserts that the Commission's thresholds for defining small and very small business are decades old and have not kept pace with the realities of today's marketplace, and that the current definitions have the effect of excluding carriers that have no ability, or limited ability, to participate absent a bidding credit. CCA notes, by way of example, that the generally acceptable small business size standard for cellular or other wireless telecommunications entities as defined by the Small Business Administration (''SBA'') is firms with 1,500 or fewer employees (including affiliates). CCA urges the Commission to reevaluate its standards when determining eligibility for bidding credits in the AWS–3 auction, rather than using the same small business size standards that were used in prior AWS auctions, but offers no suggestions regarding what alternative size standards could potentially be used for AWS–3.

187. Based on the Commission's prior experience with the use of bidding credits in spectrum auctions, we believe that the use of bidding credits is an effective tool in achieving the statutory objective of promoting participation by designated entities in the provision of spectrum-based services. In the absence of small business size standards and bidding credits, designated entities might have less of an opportunity to obtain spectrum in this band. We believe that continuing to extend such benefits to the AWS–3 bands would be consistent with our statutory mandate. We are not persuaded by the record before us that we should adopt small business size standards for AWS–3 that differ from those used in prior AWS auctions. To the contrary, in light of the

similarities between AWS–3 and the other AWS services, we adopt for AWS–3 the size standards and associated bidding credits for small businesses used in prior AWS auctions. On March 20, 2014, we requested the U.S. Small Business Administration's approval of our final rule adopting these small business size standards. Moreover, we continue to believe that use of the small business size standards and credits set forth in the part 1 schedule provides consistency and predictability for small businesses, and conclude that we would be ill-advised in the absence of any alternative size standards proposals from commenters to adopt changes to our part 1 bidding credit schedule in the context of a proceeding establishing service-specific rules for the AWS–3 bands. We also note that in first adopting small business size standards for eligibility for designated entity benefits, the Commission rejected the SBA's 1,500 employee standard as a means to qualify as a designated entity. The Commission concluded that such a definition would be too inclusive and would allow many large telecommunications firms to take advantage of preferences not intended for them. Accordingly, for the AWS–3 bands, we will define a small business as an entity with average gross revenues for the preceding 3 years not exceeding $40 million, and a very small business as an entity with average gross revenues for the preceding 3 years not exceeding $15 million. Under these definitions, small businesses would be provided with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent, consistent with the standardized schedule in part 1 of our rules. Given the record before us and the benefits discussed above, we conclude that the potential benefits of our proposals would likely outweigh any potential costs.

188. *Commercial Spectrum Enhancement Act Requirements.* The Commission noted in the *AWS–3 NPRM* that the CSEA established SRF to reimburse Federal agencies operating on certain frequencies that have been reallocated from Federal to non-Federal use for the cost of relocating their operations. The SRF is funded from cash proceeds attributable to ''eligible frequencies'' in an auction involving such frequencies. 47 U.S.C. 928(b). ''Eligible frequencies'' are defined as those in the 216–220 MHz band, the 1432–1435 MHz band, the 1710–1755 MHz band, the 2385–2390 MHz band, and any other band of frequencies reallocated from Federal use to non-Federal use or to shared use after January 1, 2003 that is assigned by competitive bidding pursuant to section 309(j) of the Communications Act. CSEA requires NTIA to notify the Commission of estimated relocation costs and timelines for relocation from eligible frequencies by eligible Federal entities at least 6 months in advance of a scheduled auction of eligible frequencies. On March 20, 2013, the Commission notified NTIA that it ''plans to commence the auction of licenses in the 1695–1710 MHz band and the 1755–1780 MHz band as early as September 2014.'' CSEA further requires that the total cash proceeds from any auction of ''eligible frequencies'' must equal at least 110 percent of estimated relocation costs of eligible Federal entities, and prohibits the Commission from concluding any auction of eligible frequencies that falls short of this revenue requirement. Section 309(j)(16)(A) of the Communications Act, which was added by section 203(b) of CSEA, required the Commission to revise its existing regulations to prescribe methods by which the total cash proceeds from any auction of licenses authorizing use of ''eligible frequencies'' shall equal at least 110 percent of the total estimated relocation costs provided to the Commission by NTIA. In implementing rules and procedures necessary to comply with CSEA, the Commission amended its reserve price rule to provide that, for any auction of ''eligible frequencies'' requiring recovery of estimated relocation costs, the Commission will establish a reserve price or prices pursuant to which the total cash proceeds from any auction of eligible frequencies shall equal at least 110 percent of the total estimated relocation costs of provided to the Commission by NTIA. The Commission also modified its Tribal land bidding credit rule to enable the Commission, in auctions subject to CSEA, to award all eligible applicants tribal land bidding credits on a *pro rata* basis in the event that the net winning bids at the close of bidding (exclusive of tribal land bidding credits) are not sufficient both to meet the reserve price(s) and to award all eligible applicants full tribal land bidding credits. The reserve price and Tribal land bidding credit rules adopted by the Commission in the *CSEA Implementation Report and Order* remain in effect today.

189. The Commission invited comment on the applicability of the 110 percent requirement in the CSEA to the various relocation and sharing scenarios discussed in the *AWS–3 NPRM.* The Commission also noted in the *AWS–3 NPRM* that the proceeds of certain spectrum required to be auctioned under section 6401 of the Spectrum Act are to be deposited in the Public Safety Trust Fund established under section 6413 of the Spectrum Act, and invited comment on the potential interplay between these Spectrum Act provisions and the CSEA. We received no comment on either of these issues. *But see* Public Knowledge *Ex Parte,* dated March 13, 2014, at 4 (revenue not required for federal relocation should be distributed in accordance with the Spectrum Act); Public Interest Spectrum Coalition Ex Parte, dated February 20, 2014, at 2 and New America Foundation *Ex Parte,* dated March 24, 2014, at 3 (suggesting attribution of a larger share of the proceeds to the 2155–2180 MHz band). Accordingly, the 110 percent requirement will be addressed in the context of determining whether and how to establish the reserve price as the final procedures are developed—through a series of public notices with opportunities for comment—that will govern the auction of licenses in the AWS–3 bands.

190. *Multi-Stage Auction and Licensing Alternatives for 1.7 GHz.* The Commission acknowledged in the *AWS–3 NPRM* that the Federal/non-Federal sharing scenarios then under consideration by CSMAC are very complex and workable rules may prove difficult to implement prior to the licensing deadlines imposed by the Spectrum Act. The Commission therefore sought comment on alternative licensing constructs that could facilitate ongoing ''operator-to-operator'' negotiations between licensees in commercial bands (*e.g.,* 2155 MHz) and Federal agencies occupying complementary Federal bands (*e.g.,* 1.7 GHz), should sharing or relocation for exclusive use not be possible. The Commission asked whether, for example, the license for the commercial bands could be paired with an ''overlay'' license in Federal bands providing that commercial use of such bands would be entirely contingent upon successful coordination with incumbent Federal users, or alternatively, whether the commercial licenses could grant to the licensee exclusive eligibility status with respect to a future assignment of rights in such Federal bands. The Commission also asked whether an auction could proceed in two stages, to enable the initial assignment of a ''negotiation right'' and subsequent payments into the Spectrum Relocation Fund to facilitate relocation or upgrades pursuant to the CSEA. Under this scenario, for example, the

first stage could assign commercial licenses and any concomitant rights to negotiate with incumbent Federal users for the use of Federal spectrum, with the second stage consisting of a supplementary round with participation limited to eligible commercial licensees, and a reserve price set based on the 110 percent funding requirement established by the CSEA. The Commission invited comment on what approaches would generate the most certainty, and therefore expected value, in the use of the spectrum.

191. T-Mobile, the only commenter that addressed this issue, opposed the issuance of overlay licenses. While T-Mobile supports operator-to-operator negotiations post-auction in order to maximize commercial licensees' access to Federal spectrum, it maintains that an overlay license approach would be inconsistent with the Spectrum Act's preference to relocate federal users to the maximum extent feasible, and with the CSEA, because activities provided for in the statute such as studying relocation options and updating equipment to facilitate clearing or shared use of the spectrum would not be undertaken if overlay licenses are issued. T-Mobile also notes that an overlay auction would create uncertainty about exactly what rights a licensee would be granted, which would potentially reduce auction participation and revenues. No commenter proposed any alternative licensing constructs or other approaches. Accordingly, based on the record before us, we do not adopt licensing alternatives for 1.7 GHz.

192. *Non-Federal Relocation and Cost Sharing (2155–2180 MHz).* There are two non-Federal incumbent services still authorized in portions of the 2155–2180 MHz band: There are approximately 250 Fixed Microwave Service (FS) licenses in the 2160–2180 MHz band and approximately five BRS licensees in the 2150–2160/62 MHz band. The FS operations in the 2160–2180 MHz band are typically configured to provide two-way microwave communications using paired links in the 2110–2130 MHz band. While few BRS systems remain, in the past BRS systems were deployed via three types of system configurations: High-power video stations, high-power fixed two-way systems, and low-power, cellularized two-way systems. Under the Commission's rules, AWS licensees in these bands must protect incumbent operations or relocate the incumbent licensees to comparable facilities, until the applicable ''sunset date,'' after which the incumbents must cease operating if the AWS licensee intends to operate a station in the relevant area. The Commission's rules also address cost-sharing reimbursement to cover the scenario where relocation of an incumbent system benefits more than one AWS licensee.

193. In the *AWS–3 NPRM,* we proposed to extend to the AWS–3 band the current relocation and cost sharing rules for both the FS in the 2160–2180 MHz band and the BRS in the 2150–2160/62 MHz band and sought comment on our proposal. Comsearch agrees with the Commission's proposal to extend the current relocation and cost sharing rules for both FS in the 2160–2180 MHz band and BRS in the 2150–2160/62 MHz. Because the 2160–2180 MHz band is paired with the 2110–2130 MHz band, which is subject to relocation and cost sharing under the AWS–1 rules, Comsearch believes that new AWS–3 licensees will face practically the same relocation issues faced by current AWS–1 licensees given that there are still over 120 FS microwave links and 4 BRS systems remaining in the bands, so it seems reasonable that the incumbent protection and relocation rules set forth in §§ 27.1111–1132 of the rules should be applicable to AWS–3.

194. We conclude that extending the current relocation and cost sharing rules for both FS in the 2160–2180 MHz band and BRS in the 2150–2160/62 MHz serves the public interest because it will continue to accelerate the relocation process and will distribute relocation costs more equitably among the beneficiaries of the relocation.

D. Allocation Matters

195. For the frequency bands considered for AWS–3 service, the *AWS–3 NPRM* identified several amendments to § 2.106 of our rules (Allocation Table) that would be necessary to accommodate the proposed changes to the use of the bands. Although these proposed amendments drew little specific comment, parties generally supported policies that would necessitate allocation changes to provide for efficient use of the AWS–3 spectrum for mobile broadband services. Accordingly, we modify the Allocation Table for the bands we are designating for AWS–3 use, as discussed below.

196. *1695–1710 MHz.* The 1695–1710 MHz band is allocated for primary Federal and non-Federal meteorological satellite (MetSat) (space-to-Earth) use. In addition, the 1695–1700 MHz portion of the band is allocated for primary Federal and non-Federal meteorological aids (radiosonde) use, and the 1700–1710 MHz portion of the band is allocated for primary Federal fixed use and secondary non-Federal fixed use. We are adopting the amendments proposed in the *AWS–3 NPRM* relating to the 1695–1710 MHz band, which were unopposed by commenters and supported by a recent NTIA Report. To facilitate the Spectrum Act's requirement that the Commission allocate this segment of the 1675–1710 MHz band to support wireless broadband use, we are amending the Allocation Table by allocating the 1695–1710 MHz band to fixed and mobile except aeronautical mobile services on a primary basis for non-Federal use. The service rules that we are adopting today do not authorize fixed use in this band. Nonetheless, a fixed service allocation will harmonize the non-Federal allocations with the adjacent 1710–1755 MHz AWS–1 band and allow for future consideration of low-power fixed use of the band, such as by customer premises equipment, thereby providing maximum flexibility for service providers to better respond to market demand, consistent with past Commission actions. In the 1700–1710 MHz band, the primary non-Federal fixed service allocation replaces an existing unused secondary allocation. We decline to allocate the 1695–1710 MHz band to the aeronautical mobile services in order to better protect Federal MetSat earth stations in this band from harmful interference.

197. We are maintaining the primary Federal MetSat (space-to-Earth) allocation in the 1695–1710 MHz band, but are limiting this allocation to 27 Protection Zones within which one or more Federal earth stations will continue to operate. Specifically, we are adopting footnote US88 to provide for the protection of certain Federal earth stations that receive in the 1695–1710 MHz band as well as a few sites below 1695 MHz to ensure there is no impact due to adjacent band emissions. NTIA has endorsed the recommendations contained in a July 2013 Final Report authored by Working Group 1 of the Commerce Spectrum Management Advisory Committee (CSMAC WG–1). CSMAC WG–1 made recommendations regarding Federal/non-Federal sharing of the 1695–1710 MHz band, including protection zones (*i.e.,* coordination areas) for Federal earth stations in this band. In addition, we are deleting the primary non-Federal MetSat (space-to-Earth) allocation from the 1695–1710 MHz band, and are permitting non-Federal earth stations to continue to receive MetSat data from primary Federal MetSat space stations on an unprotected basis. It appears that more than 160 registered U.S. users of non-Federal direct readout earth stations receive in the 1695–1710 MHz band.

See NOAA's 2011 presentation titled ''The President's Broadband Initiative: Impacts Upon NOAA Satellite and User'' at 4, 9, (available at *http://directreadout.noaa.gov/Miami11/2011_presentations.html. See also Fast Track Report,* note 11 (stating that ''Given that the satellite will continue to transmit their signals, receive-only station operators would need to convert to another access mechanism only if and when wireless broadband systems built-out in their area. Since high density metropolitan areas will be the first priority for wireless services, the operators of meteorological-satellite earth stations may find that they can continue to directly access the satellite date unimpeded for some time.''). *See* the final rules section for the text of footnote US88. The protection zones listed in footnote US88 were extracted from Table 2 of the CSMAC WG–1 Final Report. The complete list of earth station locations, protected center frequencies, and maximum protection radii for channel bandwidths of 5, 10, and 15 megahertz are specified in Table 1 of the CSMAC WG–1 Final Report.

198. We also remove from the Allocation Table three unused allocations that apply to the 1695–1710 MHz band. First, we delete the primary Federal fixed service allocation from the 1700–1710 MHz band and associated footnote G118 from the Allocation Table. Second, we delete the primary meteorological aids (radiosonde) allocation from the 1695–1700 MHz band. Third, we delete the footnote allocation that allows all other applications in the Earth exploration-satellite service (EESS) (space-to-Earth) besides MetSat applications to operate in the 1695–1710 MHz band. Previously, the Commission added a reference to international footnote 5.289 (''Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460–470 MHz and 1690–1710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.'') to the United States Table of Frequency Allocations in § 2.106. In this action, we move this text to new footnote US289, except that the ''band 1690–1695 MHz'' is specified. We note that footnotes 5.289 and US201 both provide for the same applications using different wording. Therefore, we simplify the U.S. Table by adding the text of footnote US201 to new footnote US289.

199. *2155–2180 MHz.* The 2155–2180 MHz band is presently allocated on a primary basis to fixed and mobile services in the non-Federal Table as part of the larger 2120–2180 MHz band. The *AWS–3 NPRM* noted the benefits of allowing Federal users to access the AWS–3 bands, including spectrum not presently allocated for Federal use (*e.g.,* 2155–2180 MHz) on Federal lands or properties that are generally unserved by commercial wireless networks. It sought comment on specific locations where such shared use might be appropriate, a suitable regulatory framework for that use, and amendments to the Commission's rules required to facilitate that use.

200. Oceus Networks strongly supports sharing both the 1755–1780 MHz and 2155–2180 MHz bands ''on U.S. military bases and ranges for mission-oriented tactical LTE . . . [and for] capabilities [that] would be able to evolve alongside a commercial technology roadmap.'' NTIA generally states that it agrees that expanding opportunities for preserving Federal users' access to the AWS–3 bands on Federal lands and military training ranges in areas generally served by commercial networks may allow Federal agencies greater flexibility to meet tactical, training, and other requirements. T-Mobile states that it does not object to Federal use of non-Federal spectrum in areas where commercial providers are not generally providing service, because shared use of AWS–3 spectrum could produce economies of scale and scope in for equipment for both Federal and non-Federal users, thereby lowering costs and speeding implementation. However, T-Mobile cautions that it is premature to adopt Federal sharing rules in commercial bands at present because of the urgency in bringing additional spectrum to market for mobile broadband services. T-Mobile therefore recommends that the Commission re-evaluate Federal sharing of commercial spectrum at a later date, when Federal requirements for additional spectrum versus more efficient use of existing spectrum are better understood.

201. AT&T states that Oceus has not shown a specific need to provide sharing in the 2155–2180 MHz band, and that allowing Oceus to construct and manage a secondary wireless network in a licensed market would effectively foreclose the ability of the licensee to expand its coverage into that area at a later time. Verizon states that the Commission should promote sharing in bands explicitly identified for shared use, such as the BAS band, 1780–1850 MHz, and the 3.5 GHz band, and not require sharing in bands licensed for exclusive, flexible use. Responding to Oceus's statement that that military bases are underserved by CMRS operators because carriers do not deploy in those areas, Verizon asserts that access to military bases and processes to gain approval to construct and operate wireless facilities on bases make siting there more difficult. Similarly, noting that it has cell sites on more than 130 bases nationwide (and that the number grows as siting negotiations conclude), AT&T also disagrees that there are barriers to DoD using commercial wireless technology, and notes that network buildout on military facilities can be achieved through existing procurement arrangements. Oceus responds that it has sought a geographically limited approach for specific military operations but that even broader sharing opportunities will have to be addressed in the future in non-Federal bands, that existing contract vehicles such as AT&T describes are inadequate, and that secondary user would be required to cease interfering by rule if an AWS licensee were to expand coverage into the area of the secondary license.

202. On March 21, 2014, NTIA, on behalf of DoD, requested that the Commission defer action on the specific text of a new US footnote in the Table of Allocations until requirements for a more flexible approach, beyond tactical or training applications in remote areas, can be developed in consultation with military and industry stakeholders. In accordance with NTIA's request, on behalf of DoD, we are deferring action on this matter. *See* Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC (March 21, 2014) at 2.

203. We are adopting the other amendments proposed in the *AWS–3 NPRM* relating to the 2155–2180 MHz band, which were unopposed by commenters, by updating and combining footnotes NG153 and NG178, and numbering the resultant footnote as NG41. Specifically, we: (1) Remove the first two sentences from footnote NG153; (2) revise the last sentence in footnote NG153; (3) add language highlighting that all initial non-AWS authorizations in the 2160–2180 MHz band applied for after January 16, 1992 were issued on a secondary basis; and (4) add language highlighting the sunset provisions that apply to part 101 fixed stations that were authorized on a primary basis. Part 101 use of the 2160–2180 MHz band is restricted to Common Carrier Fixed Point-to-Point Microwave Service; see 47 CFR 101.101. Applications for new facilities submitted after the adoption date of the

Notice of Proposed Rulemaking in ET Docket No. 92–9 (Jan. 16, 1992) ''will be granted on a secondary basis only.'' 47 CFR 101.79(a)(1), 101.101. We therefore remove footnotes NG153 and NG178, and add footnote NG41 to read as shown in the final rules section.

204. *1755–1780 MHz.* The 1755–1780 MHz band is presently allocated on a primary basis for Federal fixed, mobile, and space operations (Earth-to-space), but contains no non-Federal allocations. However, the *AWS–3 NPRM* observed that this band is allocated internationally on a primary basis to the fixed and mobile services in all three International Telecommunication Union (ITU) Regions. The *AWS–3 NPRM* also observed that the 1755–1780 MHz band has several characteristics that make it especially appealing for commercial wireless use, and proposed that it be used for mobile uplinks, with fixed stations not authorized in the band. The *AWS–3 NPRM* also inquired as to the changes necessary to the Allocation Table to permit commercial wireless use of the 1755–1780 MHz band. Commenters strongly supported using the 1755–1780 MHz band for commercial wireless services. As noted above, Verizon Wireless supported the proposal to prohibit fixed station use of the band, stating that the authorization of fixed high-gain antennas could cause interference to government operations in that band.

205. We concur with commenting parties that a commercial wireless service in the 1755–1780 MHz band is desirable, and establishment of that service requires that we add primary fixed and mobile service allocations to the non-Federal Table in that band. That addition will facilitate both Federal/non-Federal sharing, and a near-term spectrum auction, of that band. While that addition was not the focus of commenting parties, it finds implicit support in the record, including support from Federal users of the 1755–1780 MHz band. A fixed service allocation will permit future consideration of low power fixed use of the 1755–1780 MHz band, such as by customer premises equipment, thereby providing maximum flexibility for service providers to better respond to market demand. Additionally, we are deleting the existing fixed and mobile allocations from the Federal Table in that band, but are adding new footnote US91 to govern shared Federal/non-Federal use of the 1755–1780 MHz band, as shown in the final rules section. *See NTIA November 2013 Letter,* at the enclosures titled ''Commerce Spectrum Management Advisory Committee (CSMA) Working Group 3 (WG 3) Report on 1755–1850 MHz Satellite Control and Electronic Warfare;'' ''Commerce Spectrum Management Advisory Committee (CSMA) Working Group 4: 1755–1850 MHz Point-to-Point Microwave[,] Tactical Radio Relay (TRR)[, and] Joint Tactical Radio System/Software Defined Radio (JTRS/SDR),'' Final Report, dated July 24, 2013; and Commerce Spectrum Management Advisory Committee (CSMAC) Working Group 5 (WG–5)[:] 1755–1850 MHz Airborne Operations (Air Combat Training System, Small Unmanned Aircraft Systems, Precision-Guided Munitions, Aeronautical Mobile Telemetry), Final Report (Sept. 16, 2013).''

206. In addition, we are adopting a non-substantive update to the non-Federal Table by expanding the cross reference to part 27 of the Commission's rules, which is shown as ''Wireless Communications (27)'' in the 1710–1755 MHz band, by displaying this cross reference in the 1695–1780 MHz band. We are also adding missing cross references to part 27 of our rules in the 1850–2000 MHz band (for 1915–1920 and 1995–2000 MHz bands) and the 2000–2020 MHz band. 47 CFR 2.105(e), 27.5(j)–(k).

207. *2020–2025 MHz.* As proposed in the *AWS–3 NPRM,* we are removing footnote NG177 from the Allocation Table. Footnote NG177 related to the Broadcast Auxiliary Service in the 1990–2110 MHz band transitioning to the 2025–2110 MHz band, and that transition has now been completed. Because we are deferring consideration of rules that would apply to the 2020–2025 MHz band, we make no other allocation changes that relate to that band at this time.

208. *2025–2110 MHz.* The 2025–2110 MHz band is allocated on a primary basis to fixed and mobile services in the non-Federal Table; and on a primary basis to the space operation, Earth exploration-satellite, and space research services in the Federal Table. In the *AWS–3 NPRM,* the Commission noted and sought comment on the DoD Proposal, under which DoD proposes to relocate key operations from the 1755–1780 MHz band and to obtain increased Federal access to the shared 2025–2110 MHz band. Comments were initially mixed on this proposal, but most wireless industry commenters subsequently supported the DoD Proposal. Others also support it or believe it to be preferable to commercial use of the 2025–2110 MHz band, maintaining that 2025–2110 MHz—and especially the 2095–2110 MHz portion—is not a viable candidate band for commercial use, as it would impinge on existing uses. Recently, NTIA endorsed the DoD Proposal and recommended amendments to the Allocation Table for the 2025–2110 MHz band to implement military use of that band under specific conditions that protect non-Federal operations.

209. We find the DoD Proposal to be constructive, and consistent with efficient use of both the 1755–1780 MHz and 2025–2110 MHz bands. Commercial use of the former band can occur in a timely manner under the DoD Proposal. Accordingly, we adopt NTIA's recommended amendments in our final rules section. Specifically, we are adding primary Federal fixed and mobile service allocations to the 2025–2110 MHz band, limiting Federal use of these allocations to military use, specifying coordination requirements for such operations in accordance with a Memorandum of Understanding between Federal and non-Federal fixed and mobile operations, and providing interference protection and priority to the specified non-Federal fixed and mobile operations in this band; delete footnote US393 and add footnote US92. These amendments will take effect only after the auction of the1755–1780MHz band concludes. *See* 47 U.S.C. 309(j)(16)(B) (''The Commission shall not conclude any auction of eligible frequencies described in section 923(g)(2) of this title if the total cash proceeds attributable to such spectrum are less than 110 percent of the total estimated relocation or sharing costs provided to the Commission pursuant to section 923(g)(4) of this title.'').

210. *Statutory Requirements.* In discussing any changes to the Allocation Table, the Commission sought specific comment on any special statutory conditions that may apply, noting two particular statutory provisions of special relevance here.

211. First, Congress recognized the potential benefits of flexible spectrum allocations and in 1997 amended the Communications Act to add section 303(y), which grants the Commission the authority to adopt flexible allocations if certain factors are met. Section 303(y) provides the Commission with authority to allocate spectrum for flexible use if ''such use is consistent with international agreements to which the United States is a party; and the Commission finds, after notice and an opportunity for public comment, that such an allocation would be in the public interest; such use would not deter investment in communications services and systems, or technology development; and such use would not result in harmful interference among users.'' The Commission sought comment on how best to read section

303(y) in light of the subsequent mandate of section 6401 to ''allocate the spectrum described [therein] for commercial use.'' The Commission also sought comment on whether any allocation changes, together with the proposed service rules, proposed or identified in the *AWS–3 NPRM* or by commenters would satisfy the four elements of section 303(y) of the Act. Commenters did not address these issues. For the reasons and in light of the specific rules set forth in this order, we conclude that the allocations and service rules adopted herein satisfy these section 303(y) statutory requirements, to the extent they are not superseded by section 6401.

212. Section 1062(b) of the National Defense Authorization Act for Fiscal Year 2000 requires that, if ''in order to make available for other use a band of frequencies of which it is a primary user, the Department of Defense is required to surrender use of such band of frequencies, the Department shall not surrender use of such band of frequencies until. . .the [NTIA], in consultation with the [FCC], identifies and makes available to the Department for its primary use, if necessary, an alternative band or bands of frequencies as a replacement for the band to be so surrendered.'' Furthermore, current law requires that ''the Secretary of Commerce, the Secretary of Defense, and the Chairman of the Joint Chiefs of Staff jointly certify. . .that such alternative band or bands provides comparable technical characteristics to restore essential military capability that will be lost as a result of the band of frequencies to be so surrendered.''

213. NTIA states that the amendments to the Allocation Table for the 2025–2110 MHz band that it recommends—and that we are adopting herein—''would provide DoD additional spectrum access to a band with comparable technical characteristics to restore essential military capabilities that will be lost as a result of relocating systems out of 1755–1780 MHz, a statutory requirement under the Secretary of Commerce's, DoD's, and the Chairman of the Joint Chiefs of Staff's joint certification to Congress under the National Defense Authorization Act for Fiscal Year 2000.'' Section 1062(b) of the National Defense Authorization Act for Fiscal Year 2000 (Public Law 106–65; 113 Stat. 768); *see also* provisions (Surrender of Department of Defense Spectrum) set out as a note under 47 U.S.C. 921. Based on NTIA's representation, we view this statutory provision as satisfied. This rule change will take effect only after the auction for 1755–1780 MHz concludes, *see* 47 U.S.C. 309(j)(16)(B), and the joint certification is submitted to Congress.

E. Federal/Non-Federal Coordination

214. In the *AWS–3 NPRM,* the Commission sought comment on coordination procedures including whether coordination models or elements thereof used in different wireless and satellite services would be applicable. In particular, the Commission sought comment on whether the coordination procedures established for non-Federal licensees to gain early access to adjacent AWS–1 uplink band (1710–1755 MHz) could serve as a model for coordination. The Commission explained that, in AWS–1, the Commission worked closely with NTIA to craft a coordination procedure before the full band transition was completed. ''Prior to operating, the AWS–1 licensee was required to contact the appropriate Federal agency to get information necessary to perform an interference analysis. The AWS–1 licensee would first perform the interference analysis and then send it to the appropriate designated agency contact for review. At the end of 60 days, if the Federal agency raised no objection, the AWS–1 licensee was permitted to commence operations. NTIA required Federal agencies to cooperate with AWS–1 licensees and provide, within 30 days of a request from an AWS–1 licensee wishing to operate within a coordination zone, site-specific technical information that would allow the licensee to complete the interference analysis. NTIA also required agencies that disapprove of an interference analysis submitted by an AWS–1 licensee to provide the licensee with a detailed rationale for its disapproval. Finally, Federal agencies were required to work in good faith to identify the source of the harmful interference and work with AWS–1 licensees to eliminate or mitigate the interference.'' *AWS–3 NPRM,* 28 FCC Rcd at 11510 para. 67 citing The Federal Communications Commission and the National Telecommunications and Information Administration—Coordination Procedures in the 1710–1755 MHz Band, *Public Notice,* 21 FCC Rcd 4730 (2006) (*AWS–1 Coordination Procedures PN*).

215. T-Mobile recommends that the Commission pattern the AWS–3 coordination process after the process used by non-Federal licensees to gain early access to AWS–1 spectrum. Raytheon disagrees and argues that AWS–1 coordination procedures would not offer sufficient protection to the 1695–1710 MHz band. Motorola recommends that if the Commission does not apply AWS–1 coordination procedures to the AWS–3 spectrum, then it should apply part 27 coordination procedures. Mobile Future argues that the Commission should work with NTIA to develop an interference protection model, inputs to the model, and the coordination procedure. Such efforts, Mobile Future continues, should address issues that should be resolved before an auction commences.

216. The Commission recognizes that bidders need as much certainty as possible regarding the scope of Federal incumbency, relocation timelines, and the potential for temporary or indefinite sharing through geographic or temporal access to spectrum. *Accord,* Annex O section O.4.2 (''NTIA expects that the transition plans' content will provide valuable information to prospective bidders preparing for an auction and to winning bidders planning for their system deployments or leasing strategies.'') and section O.5.1 (''With regard to spectrum sharing in eligible frequencies, the statute contemplates a range of potential arrangements including: (1) Short-term or temporary sharing in anticipation of the ultimate relocation of federal entities' spectrum-related operations; (2) long-term or indefinite sharing between federal entities and non-federal users; and (3) sharing among relocated federal entities and incumbents to make spectrum available for non-federal use.''). Indeed, such certainty is central to meeting the goals of the Spectrum Act to fund the Public Safety Broadband Network and to improve the CSEA to facilitate better transparency, coordination, and predictability for bidders and licensees. *See* Relocation of and Spectrum Sharing by Federal Government Stations—Technical Panels and Dispute Resolution Boards, 78 FR 5310, 5311 (NTIA, Jan. 25, 2013) (the Spectrum Act improved the CSEA provisions to ''facilitate better transparency, coordination, and predictability for bidders in FCC spectrum auctions and the ultimate winners of those auctions through, for example, a new requirement that NTIA publish the agencies transition plans on NTIA's Web site at least 120 days before commencement of the corresponding FCC auction, with the exception of classified and other sensitive information.'').

217. *Post-auction: Federal/Non-Federal Coordination Requirement. Section 309(j)(16)(C) Condition:* There are two Federal/non-Federal coordination scenarios: (1) ''early access'' prior to Federal relocation and (2) permanent sharing. Under the first

scenario, the Commission is required to condition non-Federal licenses on not causing harmful interference to relocating Federal operations. The Spectrum Act did not amend this provision of the original CSEA (2004), which contemplated Federal relocations but not the Federal non-Federal sharing scenario added by the Spectrum Act. Accordingly, we conclude that this statutory provision governs the scenario for which it was adopted—Federal relocations—and that it is inapplicable to the sharing scenario under which termination of the eligible Federal entity's authorization is unrestricted. We will apply the condition to each AWS–3 license by rule. Thus, licenses to operate in the 1695–1710 MHz or 1755–1780 MHz bands are subject to the condition that the licensee must not cause harmful interference to an incumbent Federal entity relocating from these bands under an approved Transition Plan. This condition remains in effect until NTIA terminates the applicable authorization of the incumbent Federal entity. Although this statutory license condition does not apply to the permanent sharing scenario added by the Spectrum Act, the rules we adopt today require successful coordination to avoid causing harmful interference to these Federal incumbents.

218. *General Coordination Requirement.* For both coordination scenarios (early access prior to Federal relocation and permanent sharing) successful coordination with Federal incumbents is required prior to operation as follows:

- 1695–1710 MHz: 27 Protection Zones with distances depending on uplink EIRP
- 1755–1780 MHz: unless stated otherwise in a Joint FCC/NTIA public notice (or in a written agreement among all relevant parties) the coordination requirement is as follows depending on the type of Federal authorization(s) involved:
  - *US&P Federal assignments:* Each AWS licensee must contact each Federal agency that has U.S. and Possessions (US&P) authority prior to its first operations in its licensed area to reach a coordination arrangement on an operator-to-operator basis.
  - *Other Federal assignments:* Each AWS licensee must successfully coordinate a proposed operation with each non-US&P Federal incumbent. The default requirement is a nationwide coordination zone with possible revisions and details to be announced in a Joint FCC/NTIA public notice.

219. *Joint FCC/NTIA Public Notice on Coordination Details.* Federal use of the radio spectrum is generally governed by the NTIA while non-Federal use is governed by the Commission. As such, consistent with the approach used for AWS–1, we believe that any guidance or details concerning Federal/non-Federal coordination should be issued jointly by NTIA and the Commission. In this regard, we authorize and direct the Wireless Telecommunications Bureau to work with NTIA staff, in collaboration with affected Federal agencies or CSMAC members, to develop a joint FCC and NTIA public notice with information on coordination procedures in the 1695–1710 MHz and 1755–1780 MHz bands. We understand that one or more Federal incumbents are proposing to develop one or more online portals, similar to the portal that DoD developed for AWS–1, that would permit AWS licensees to submit coordination data online in a standard format for distribution to the relevant Federal incumbents. Until such online capability exists, the Spectrum Act requires each incumbent agency to include contact information in its Transition Plan. Until a coordination portal is operational, licensees will have to rely on the point of contact provided in each agency's transition plan.

220. The successful implementation of commercial services in the AWS–3 bands depends upon successful coordination and sharing with Federal users, whether on a temporary basis as Federal systems relocate their operations or on an ongoing, permanent shared basis for those systems that remain in the band. The Federal incumbents in the 1695–1710 MHz and 1755–1780 MHz bands must be able to continue operations free from harmful interference and without being held accountable for interference into new commercial operations while the agencies are operating within their authorized operational parameters. Similarly, federal incumbents remaining in the band must be able to have the flexibility to coordinate with commercial licensees if reasonable modification of existing, grandfathered operations are required in the future. We expect a good faith effort from both the AWS–3 licensees and the Federal incumbents to share information about their systems, agree to appropriate interference methodologies, and communicate results so as to facilitate commercial use of the band. This extends to AWS licensees sharing information with Federal incumbents and cooperating in testing once Federal incumbents develop and implement real-time spectrum monitoring systems around existing Federal operations protected in the 1695–1710 MHz and adjacent bands.

221. *Pre-auction Information on Federal Incumbents for Bidders.* NTIA must post the public version of each approved transition plan on its Web site no later than 120 days before the start date of the auction. The transition plans must generally describe an agency's plan for ''the implementation by such entity of the relocation or sharing arrangement.'' The plans the agencies submitted to NTIA and the Technical Panel contain information about the frequencies used, emission bandwidth, system use, geographic service area, timeline for sharing, timeline for transition, and estimated cost of relocation or sharing. Agencies that will not be able to release the entire plan will need to make a determination regarding what information can be released to reasonably help inform potential bidders about the incumbent Federal uses and the timelines for sharing and relocation.

222. *Supplemental Information Access:* Affected agencies are permitted to redact from the publicly-released transition plans classified national security information and ''other information for which there is a legal basis for nondisclosure and the public disclosure of which would be detrimental to national security, homeland security, or public safety or would jeopardize a law enforcement investigation'' from the publicly-released transition plans. In the event that publicly-released transition plans contain incomplete information or lack key information necessary for potential bidders to accurately value the spectrum, the FCC, NTIA, and the affected Federal agencies will collaborate with industry stakeholders on possible supplemental information disclosure processes. *See, e.g.,* Letter from Scott K. Bergman, Vice President, Regulatory Affairs, CTIA, to FCC Chairman Wheeler and Commissioners Clyburn, Rosenworcel, Pai, and O'Reilly, and Assistant Secretary Strickling, NTIA, dated Feb. 25, 2014 (proposing a three-stage timeline for release of Federal agencies' transition plans and technical data under which Federal agencies would open a window for executing non-disclosure agreements to receive information under the second and third stages). We recognize that any supplemental information disclosure must appropriately protect national security considerations and law enforcement equities in accordance with

the statutory requirement. If it is determined that a supplemental information release process will be necessary and can be finalized, a Public Notice will announce the process.

F. Interoperability Requirement

223. In the *AWS–3 NPRM,* the Commission asked commenters to address any specific technical rules for the AWS–3 bands. USCC, T-Mobile, and several other commenters seek an interoperability requirement among AWS–1 and AWS–3 devices, or at least among AWS–3 devices in the 1755–1780 MHz band (paired with 2155–2180 MHz band), asserting that interoperability creates significant benefits. USCC urges the Commission to adopt a clear, *ex ante* interoperability requirement, stating that access to interoperable devices by all AWS–3 licensees also would enhance economies of scale, expand roaming opportunities, and promote competition, which would lead to greater investment and innovation and lower costs for consumers. Specifically, USCC would require that: (1) All AWS–3 mobile devices be capable of transmitting across the entire 1710–1780 MHz uplink band and receiving across the entire 2110–2180 MHz downlink band; and (2) all AWS–3 networks support and permit the use of such mobile devices. USCC stresses that it is particularly important for the AWS–3 interoperability requirement to obligate licensees to include all of the paired 1755–1780/2155–2180 MHz bands. USCC states that a failure to adopt this requirement would significantly reduce the value of the AWS–3 spectrum blocks located outside of the current 3GPP Band 10 frequency range (1710–1770 MHz/2110–2170 MHz band). USCC contends that this could encourage the large national carriers to focus on, and thus monopolize, the other AWS–3 blocks, leaving only the ''orphaned'' uppermost 10 megahertz of AWS–3 spectrum potentially available to small and regional carriers, who even collectively lack sufficient market power to drive device development. T-Mobile supports interoperability between AWS–3 and AWS–1 and states that the Commission should require interoperability for future AWS–3 devices. T-Mobile also asserts that interoperability will promote a global market, not hinder availability, affordability, and portability of user equipment as ''boutique'' band classes will; as well as delaying deployment of services.

224. DISH proposes an interoperability requirement similar to USCC's proposal, except DISH would include the AWS–4 downlink band at 2180–2200 MHz. Verizon opposes any equipment interoperability mandate and Verizon and AT&T state that the *AWS–3 NPRM* did not propose or seek comment on an interoperability requirement between AWS–3 and AWS–4. Verizon also notes that that DISH filed its AWS 1/3/4 interoperability proposal very recently and that there is inadequate time for parties to evaluate it in this proceeding from a technical or other perspective. DISH acknowledges the timing of its specific interoperability proposal but states that the Commission discussed in detail the efficiencies of combining adjacent AWS–1 spectrum with AWS–3 and that the general concept of interoperability has been discussed in the record at length as it relates to combining the AWS–1 and AWS–3 bands. Because the Commission tentatively found that having additional spectrum that is adjacent to that used for like services would promote efficiency in broadband deployment. DISH asserts that rules that promote efficiency based on the principle of spectrum adjacency would be a logical outgrowth of the *AWS–3 NPRM's* tentative finding, no matter which side of the AWS–3 downlinks the adjacent spectrum is on. DISH also dismisses as misguided Verizon's suggestion that there may be ''technical limitations'' that would prevent or delay the addition of 2180–2200 MHz to the AWS downlink ecosystem as follows: ''DISH's proposal for interoperability between the AWS–1, AWS–3, and AWS–4 downlink bands impacts only *devices,* which are operating in receive mode and are not subject to any transmit restrictions. Furthermore, nothing in DISH's proposal requires any changes to base stations operating in transmit mode in the downlink band for AWS operators. Therefore, Verizon's introduction of the possible impact of ''federal AMT operations at 2200–2290 MHz'' on ''AWS–3 equipment that also includes the AWS–4 downlink band'' is irrelevant. Such federal operations are only relevant to DISH's base stations in 2180–2200 MHz.'' DISH *Ex Parte* dated March 20, 2014.

225. The Commission historically has been interested in promoting interoperability. Beginning with the licensing of cellular spectrum, the Commission maintained that consumer equipment should be capable of operating over the entire range of cellular spectrum as a means to ''insure full coverage in all markets and compatibility on a nationwide basis.'' Although the Commission did not adopt a rule to require band-wide interoperability for PCS, it again stressed the importance of interoperability by acknowledging industry efforts to establish voluntary interoperability standards and asserted that ''[t]he availability of interoperability standards will deliver important benefits to consumers and help achieve our objectives of universality, competitive delivery of PCS, that includes the ability of consumers to switch between PCS systems at low cost, and competitive markets for PCS equipment.'' The Commission also stated that if PCS technology did not develop in a manner to accommodate roaming and interoperability, it might consider ''what actions the Commission may take to facilitate the more rapid development of appropriate standards.'' In 1997, we established a rule requiring receiver interoperability for satellite digital audio radio services, and in implementing authority over public safety broadband systems prior to the Spectrum Act, the Commission determined in 2007 that it was ''imperative'' to establish a nationwide broadband interoperability standard. More recently, in WT Docket No. 12–69, the Commission took certain steps to implement an industry solution to provide interoperable Long Term Evolution (LTE) service in the Lower 700 MHz band in an efficient and effective manner to improve choice and quality for consumers of mobile services. A number of the principal wireless providers licensed in the 700 MHz band, along with the Competitive Carriers Association, had developed a voluntary industry solution that would resolve the lack of interoperability in this band while allowing flexibility in responding to evolving consumer needs and dynamic and fast-paced technological developments. In reviewing the voluntary solution, the Commission determined that amendments to the rules and modifications to licenses serve the public interest by enabling consumers, especially in rural areas, to enjoy the benefits of greater competition and more choices, and by encouraging efficient use of spectrum, investment, job creation, and the development of innovative mobile broadband services and equipment. Although no party requested that we impose an interoperability requirement with respect to the 10 megahertz of H Block spectrum, as they have for the larger AWS–3 band in this proceeding, we stressed again in that context that ''interoperability is an important aspect

of future deployment of mobile broadband services and generally serves the public interest.''

226. In the *AWS–3 NPRM,* the Commission noted that, where possible, it was proposing to adopt for AWS–3 the same technical rules that apply to AWS–1 and wireless industry commenters overwhelmingly supported this approach—with strong objections to the Commission's proposal to depart from the AWS–1 power limit for mobiles and portables. The Commission also asked whether to pair any of the proposed AWS–3 band segments, and whether there are likely to be any competitive effects of the pairing choice that it should consider. Wireless industry commenters overwhelmingly urge us to designate 1755–1780 MHz for AWS paired with 2155–2180 MHz due to its adjacency to AWS–1. Indeed, for well over the past decade, the wireless industry has sought commercial use of the 1710–1780 MHz Federal band to pair with the 2110–2180 MHz non-Federal band. In 2006, the Commission issued licenses for AWS–1 at 1710–1755/2110–2155 MHz. In 2008, the Commission proposed AWS service rules for 2155–2180 MHz unpaired, and most wireless industry commenters in that proceeding urged the Commission to defer action until 2155–2180 MHz could be licensed paired with 1755–1780 MHz. As discussed above, the record now before us overwhelmingly indicates that licensing 1755–1780 MHz paired with 2155–2180 MHz is ideal precisely because it is contiguous to and can be used as an extension of the AWS–1 bands. AT&T, in supporting the pairing of 1755–1780 MHz and 2155–2180 MHz, states that ''[t]he ability to combine the AWS–3 and AWS–1 bands in a single band class would result in more efficient spectrum utilization and more efficient LTE networks.'' The existence of Band Class 10 supports this conclusion but, as USCC and other commenters have noted, it could also result in outcomes inimical to the public interest—operations in the United States limited to Band 10, *e.g.,* if large carriers focused on blocks within Band 10 leaving 1770–1780/2170–2180 MHz ''orphaned.''

227. To the extent that smaller operators favor smaller license sizes, we note that the AWS–3 paired block that we are designating for the smallest geographic licensing area (CMAs) and all of the smallest, 5 megahertz paired blocks, are within existing Band Class 10. Additionally, based on the record before us, we conclude that the public interest is best served by requiring AWS–3 mobile and portable stations that operate on any frequencies in the 1755–1780 MHz band (paired with the 2155–2180 MHz band) to be capable of operating on all frequencies in the 1710–1780 MHz band (paired with the 2110–2180 MHz band) using all air interfaces that the equipment utilizes on any frequencies in the 1710–1780 MHz band (paired with frequencies in the 2110–2180 MHz band). Although Section 6401 of the Spectrum Act would require us to auction and license these bands by February 2015 pursuant to flexible use service rules whether or not we adopt an additional interoperability requirement, we conclude that adopting such a requirement prior to licensing best serves the public interest by removing uncertainty, *e.g.,* for potential applicants that intend to follow 3GPP standards if licensed in the 1755–1780 MHz and 2155–2180 MHz bands. As several commenters note, voluntary industry band classes for commercial systems can significantly benefit or harm consumers. ''Adopting an interoperability requirement will help to 'promote timely access to a variety of mobile devices by all AWS–3 licensees, including small and regional carriers' while preventing a situation, like that in the 700 MHz band, where manufacturers focused on the needs of the larger carriers, which significantly delayed 'the deployment of advanced services to many rural and underserved areas.' '' Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4 quoting USCC Comments at 18. With an assurance of basic interoperability across 1755–80 MHz (paired with 2155–2180 MHz) and AWS–1, potential licensees, particularly smaller ones, will face less uncertainty over the development of a healthy device ecosystem. ''Interoperability will also 'facilitate roaming arrangements and allow smaller regional carriers to compete with the larger carriers—a result that is in the public interest.' '' Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4 quoting USCC Comments at 24. We note that at this time this rule applies to AWS–3 licensees and AWS–3 bands as described herein. We adopt this basic interoperability requirement pursuant to our separate authority under Title III of the Communications Act. *See* 47 U.S.C. 301, 303(b), 303(g), 303(r). *See also id.* sections 153(28) (defining ''mobile stations''), (42) (defining station license by reference to ''use or operation of apparatus''), 153(57) (defining transmission to include ''all instrumentalities, facilities, and services incidental'' thereto), 154(i). *See generally Lower 700 MHz Interoperability R&O,* 28 FCC Rcd at 15155–56 paras. 69–70 (2013).

228. Consistent with precedent, we stress the importance of promoting interoperability throughout the 1710–1780 MHz/2110–2180 MHz band—as reflected in the industry efforts to establish voluntary interoperability standards covering most of this spectrum and the overwhelming industry representations herein, and for well over the past decade before Congress, the Executive Branch, internationally, and the Commission, as to the suitability of the 1710–1780 MHz band (paired with 2110–2180 MHz) for AWS operations. Indeed, a failure to achieve basic interoperability of devices using the same air interface(s) in the 1710–1780 MHz band (paired with the 2110–2180 MHz band) would be completely at odds with longstanding commercial wireless industry-wide efforts for access to additional spectrum. With this in mind, we emphasize that the availability of voluntary interoperability standards will deliver important benefits to consumers and help achieve our objectives of universality, competitive delivery of devices that utilize the 1710–1780 MHz band (paired with the 2155–2180 MHz band) because devices that operate in the 1755–1780 MHz band (paired with 2155–2180 MHz) will include the AWS–1 bands, thereby promoting the ability of consumers to switch between AWS systems that use the same air interface(s) at low cost, and competitive markets for equipment.''

229. Finally, we recognize that USCC initially sought an interoperability requirement that extends to 1695–1710 MHz and that DISH recently proposed including the 2180–2200 MHz AWS–4 band. Given that 1695–1710 MHz will be auctioned and licensed unpaired, we conclude that extending an interoperability requirement to this band at this time would be inappropriate because the downlink band(s) is undetermined. At this time, we also decline DISH's suggestion to add the AWS–4 downlink band (2180–2200 MHz) into the basic interoperability rule for AWS–3 licensees. The record is not developed on this issue and relevant technical issues have not been fully explored by commenters. Apart from longstanding, wireless industry-wide advocacy for 1710–1780 MHz paired with 2110–2180 MHz, the record before us reflects among AWS–1/3 interoperability proponents a reciprocal understanding of sorts among potential, future AWS–3 licensees: If licensed in 1755–1780/2155–2180 MHz, each proponent is willing to accept any burden arising

from the interoperability requirement that it seeks. On the other hand, DISH's proposed AWS–1/3/4 interoperability requirement would not apply to any AWS–4 devices. While this lack of reciprocity does not disqualify the proposal, the distinction is a consideration that cannot be ignored. Nonetheless, we appreciate the potential public interest benefits of an expansive, interoperable, band extending across most, or possibly all, of the 1.7 GHz uplink band and the 2.1 GHz downlink band. Accordingly, at this juncture, we encourage interested parties to work towards voluntary, standards-based solutions to facilitate interoperability, to the extent technically practical, across all of these AWS–1/3/4 bands. Once AWS–3 is licensed, we expect AWS–3 licensees to participate in good faith in standard setting processes to extend interoperability across AWS–1/3/4 (1710–1780 MHz and 2110–2200 MHz), unless there are technical impediments to doing so. If technical concerns arise, we expect parties to work to find reasonable measures to remedy those concerns. In the absence of technical impediments to interoperability, if the Commission determines that progress on interoperability has stalled in the standards process, future AWS–3 licensees are hereby on notice that the Commission will consider initiating a rulemaking regarding the extension of an interoperability mandate that includes AWS–4 (2180–2200 MHz) at that time. Should we undertake such a rulemaking, relevant considerations may include considerations of harmful interference, technical cost and difficulty of implementation, and the extent to which licensees are common to both the AWS–3 and AWS–4 bands.

III. Procedural Matters

A. Ex Parte Presentations

230. We remind interested parties that this proceeding is ''permit-but-disclose'' proceeding in accordance with the Commission's *ex parte rules.* Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with § 1.1206(b). In proceedings governed by § 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.,* .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte rules.*

231. As discussed in section II.E (Federal/Non-Federal Coordination) above, in the process of developing one or more joint public notices regarding Federal/non-Federal coordination, NTIA may seek recommendations from the Commerce Spectrum Management Advisory Committee (CSMAC). CSMAC is an advisory committee created for the purpose of advising NTIA on spectrum policy issues. CSMAC consists of private-sector ''Special Government Employees'' appointed by NTIA to provide advice and recommendations on U.S. spectrum management policy. Commission staff has been present at meetings of the full CSMAC and has participated in CSMAC's working groups. *See, e.g.,* Wireless Telecommunications Bureau and Office of Engineering and Technology Exempt Certain *Ex Parte* Presentations in GN Docket No. 13–185, *Public Notice,* 28 FCC Rcd 12268 (WTB,OET 2013). Commission staff's participation in these meetings, and the free flow of information during the meetings, is essential to gaining an understanding of the issues implicated in making 1695–1710 MHz and 1755–1780 MHz available for commercial wireless use. While the CSMAC's meetings are open to the public, the FCC's *ex parte* requirements could, depending on the particular factual circumstances, be triggered if FCC decision makers are present, and oral or written presentations are made. Similarly, meetings of the CSMAC's working groups could, depending on the particular factual circumstances, be subject to the Commission's *ex parte* rules when FCC decision makers are present, if oral or written *ex parte* presentations are made.

232. Therefore, pursuant to our authority under § 1.1200 of the Commission's rules, we continue the limited exemption in the AWS–3 proceeding (GN Docket No. 13–185) from the *ex parte* disclosure requirements of § 1.1206 presentations made in formally organized meetings of the CSMAC at which FCC staff is present, and meetings held in connection with CSMAC, including working groups in which FCC staff is a participant. Such presentations will be exempt to the same extent as presentations are exempt under the shared jurisdiction exemption of § 1.1204(a)(5). Specifically, the *ex parte* requirements do not apply provided that ''any new factual information obtained through such a presentation that is relied on by the Commission in its decision-making process will, if not otherwise submitted for the record, be disclosed by the Commission no later than at the time of the release of the Commission's decision.'' We note that this exemption does not change the nature of public CSMAC proceedings; it simply allows FCC staff to participate without triggering disclosure requirements under the Commission's *ex parte* rules.

233. The *AWS–3 Report and Order* discusses matters concerning relocating federal users in 1695–1710 MHz and 1755–1780 MHz, spectrum sharing between commercial and federal users in 1695–1710 MHz and 1755–1780 MHz, and implementation matters related to the Spectrum Relocation Fund and the Public Safety Trust Fund. Discussions regarding these matters, may not be open to the public, and will occur between or among several agencies or branches of the Federal Government. Commission staff is regularly engaged with staff from NTIA, the Department of Defense (DoD), the Office of Management and Budget (OMB), the Office of Science and Technology Policy (OSTP), the Department of Justice (DoJ), the National Oceanic and Atmospheric Administration (NOAA), and other federal agencies and offices for the purpose of coordinating these matters, including but not limited to facilitating commercial use of the 1695–1710 MHz and 1755–1780 MHz bands. In addition, relevant Congressional committees have sought to further facilitate discussion

among Federal Government stakeholders. Some of these discussions may already be subject to the § 1.1204(a)(5) *ex parte* exemption in the Commission's rules, to the extent that they involve a matter over which that agency or branch and the Commission share jurisdiction, while others may not. We believe that these discussions among Federal Government personnel will benefit from an uninhibited flow of information between and among all participants, including potentially sensitive information regarding strategic federal use of these bands.

234. Therefore, pursuant to our authority under § 1.1200 of the Commission's rules, we exempt from the *ex parte* disclosure requirements of § 1.1206 presentations regarding the AWS–3 proceeding (GN Docket No. 13–185) made between representatives from the FCC and NTIA, OMB, OSTP, DoD, DoJ, NOAA, other federal offices and agencies, or Congressional committee members and committee staff, to the same extent as presentations are exempt under the shared jurisdiction exemption of § 1.1204(a)(5).

235. To the extent that any of the participants in the above-described meetings intends the Commission, with respect to any decision it makes in the AWS–3 proceeding, to rely on an *ex parte* presentation to which we have extended an exemption *herein,* we encourage that party to file the presentation (or, if oral, summary of it) in the record with ample time for other interested parties to the proceeding to review and respond, as appropriate, and for Commission staff to fully analyze and incorporate as necessary into any subsequent Commission decision. In this regard, we advise these participants that, consistent with the limitations of the exemption that we have established herein for the AWS–3 proceeding, in rendering a decision in this proceeding the Commission will not rely on an *ex parte* presentation covered by this exemption unless it is added to the record, at the latest, prior to the release of the decision.

B. Final Regulatory Flexibility Analysis

236. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), the Commission incorporated an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *Notice of Proposed Rulemaking (NPRM).* No comments were filed addressing the IRFA. Because we amend the rules in the *Report and Order,* we have included this Final Regulatory Flexibility Analysis (FRFA) which conforms to the RFA. *See* 5 U.S.C. 601–612. The RFA has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Public Law 104–121, Title II, 110 Stat. 857 (1996).

237. *Need for, and Objectives of, the Report and Order.* Wireless broadband is a critical component of economic growth, job creation, and global competitiveness and consumers are increasingly using wireless broadband services to assist them in their everyday lives. The rapid adoption of smartphones and tablet computers, combined with deployment of high-speed 3G and 4G technologies, is driving more intensive use of mobile networks, so much so that the total number of mobile wireless connections now exceeds the total U.S. population. As of the second quarter of 2013, 64 percent of U.S. mobile subscribers owned smartphones. It is predicted that by 2019, almost all handsets in North America will be smartphones and that total smartphone traffic over mobile networks will increase 10 times between 2013 and 2019. As of June 2013, 34 percent of American adults owned a tablet computer device, an increase from only 18 percent in September 2010. Tablets generated on average approximately 2.6 times the amount of mobile traffic as the average smartphone in 2013. All of these trends are resulting in more demand for network capacity and for capital to invest in the infrastructure, technology, and spectrum to support this capacity. The demand for spectrum, moreover, is expected to continue increasing. In response, both Congress and the President have issued directives to make available additional spectrum for flexible uses, including mobile broadband. The Commission continues to work to make available additional licensed and unlicensed spectrum to meet this growing demand.

238. In the *Report and Order,* we increase the Nation's supply of spectrum for mobile broadband by adopting rules for fixed and mobile services, including Advanced Wireless Services (''AWS'') in the 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands, some of which were previously allocated exclusively for Federal government use. We refer to these bands collectively as ''AWS–3.'' These service rules will make available 65 megahertz of spectrum for flexible use in accordance with the Spectrum Act. Specifically, we adopt service, technical, and licensing rules that will encourage innovation and investment in mobile broadband and provide certainty and a stable regulatory regime in which broadband deployment can rapidly occur. For example, we find the spectrum is properly allocated for commercial use as the Spectrum Act requires, and authorize mobile operations in the 1695–1710 MHz and 1755–1780 MHz bands and base and fixed operations in the 2155–2180 MHz band. We also adopt service, technical, assignment, and licensing rules for this spectrum that generally follow the Commission's part 27 rules that govern flexible use terrestrial wireless service—except that in order to protect incumbents that remain in these bands, our rules are more stringent in certain respects. For example, to protect certain Federal operations in the 1695–1710 MHz and 1755–1780 MHz bands from harmful interference, we adopt technical rules that require AWS–3 licensees using these frequencies to coordinate their proposed operations with NTIA prior to commencing operations. The market-oriented licensing framework for these bands will ensure efficient spectrum utilization and will foster the development of new and innovative technologies and services, as well as encourage the growth and development of broadband services, ultimately leading to greater benefits to consumers.

239. A portion of the proceeds from the auction of Federal spectrum will be used to cover the relocation and sharing costs of Federal incumbents associated with relocating their spectrum-dependent systems from spectrum bands authorized to be auctioned under the Commission's competitive bidding authority. A portion will also be made available for use by the First Responder Network Authority (FirstNet) to carry out its duties and responsibilities, among other things, to deploy and operate a nationwide public safety broadband network.

240. *Legal Basis.* The actions taken are authorized pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, and Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Public Law 112–96, 126 Stat. 156, 47 U.S.C. 151, 152, 154(i), 201, 301, 302a, 303, 307, 308, 309, 310, 316, 319, 324, 332, 333, 1403, 1404, and 1451.

241. *Description and Estimate of the Number of Small Entities to Which the Rules Will Apply.* The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and policies, if adopted. The RFA generally defines the term ''small entity'' as

having the same meaning as the terms ''small business,'' ''small organization,'' and ''small governmental jurisdiction.'' In addition, the term ''small business'' has the same meaning as the term ''small business concern'' under the Small Business Act. 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.

242. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards that encompass entities that could be directly affected by the proposals under consideration. As of 2010, there were 27.9 million small businesses in the United States, according to the SBA. Additionally, a ''small organization'' is generally ''any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.'' Nationwide, as of 2007, there were approximately 1,621,315 small organizations. Finally, the term ''small governmental jurisdiction'' is defined generally as ''governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.'' Census Bureau data for 2007 indicate that there were 89,527 governmental jurisdictions in the United States. We estimate that, of this total, as many as 88,761 entities may qualify as ''small governmental jurisdictions.'' Thus, we estimate that most governmental jurisdictions are small.

243. *Wireless Telecommunications Carriers (except satellite).* This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services. The appropriate size standard under SBA rules is for the category Wireless Telecommunications Carriers. The size standard for that category is that a business is small if it has 1,500 or fewer employees. For this category, census data for 2007 show that there were 11,163 establishments that operated for the entire year. Of this total, 10,791 establishments had employment of 999 or fewer employees and 372 had employment of 1000 employees or more. Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities that may be affected by our proposed action. Similarly, according to Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, PCS, and Specialized Mobile Radio (SMR) Telephony services. Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than 1,500 employees. Consequently, the Commission estimates that approximately half or more of these firms can be considered small. Thus, using available data, we estimate that the majority of wireless firms can be considered small.

244. *Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements.* The projected reporting, recordkeeping, and other compliance requirements resulting from the *Report and Order* will apply to all entities in the same manner. The Commission believes that applying the same rules equally to all entities in this context promotes fairness. The Commission does not believe that the costs and/or administrative burdens associated with the rules will unduly burden small entities, as discussed below. The revisions the Commission adopts should benefit small entities by giving them more information, more flexibility, and more options for gaining access to valuable wireless spectrum.

245. Any applicants for AWS–3 licenses will be required to file license applications using the Commission's automated Universal Licensing System (ULS). ULS is an online electronic filing system that also serves as a powerful information tool, one that enables potential licensees to research applications, licenses, and antenna structures. It also keeps the public informed with weekly public notices, FCC rulemakings, processing utilities, and a telecommunications glossary. AWS–3 licensees that must submit long-form license applications must do so through ULS using Form 601, FCC Ownership Disclosure Information for the Wireless Telecommunications Services using FCC Form 602, and other appropriate forms.

246. *Steps taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered.* The RFA requires an agency to describe any significant alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

247. As set forth in the *Report and Order,* we will license the AWS–3 bands under a hybrid of Economic Area (EA) and Cellular Market Area (CMA) geographic licenses. Licensing some spectrum blocks on an EA basis best balances the Commission's goals of encouraging the offering of broadband service both to broad geographic areas and to sizeable populations, while licensing one block by CMA will enable smaller carriers to serve smaller, less dense population areas that more closely fit their smaller footprints. Licensees may also adjust their geographic coverage through secondary markets. These rules should enable licensees of AWS–3 spectrum, or any entities providing service in other AWS bands, whether large or small, to more easily adjust their spectrum holdings to build their networks pursuant to individual business plans. As a result, we believe the ability of licensees to adjust spectrum holdings will provide an economic benefit by making it easier for small entities to acquire spectrum or access spectrum in these bands.

248. The *Report and Order* adopts rules to protect licensees operating in nearby spectrum bands from harmful interference, which may include small entities. The technical rules adopted in the *Report and Order* are based on the rules for AWS–1 spectrum, with specific additions or modifications designed, among other things, to protect Federal incumbents and Broadband Radio Service licensees that will share some of the AWS–3 spectrum. The technical rules in the *Report and Order* will therefore allow licensees of the AWS–3 spectrum to operate while also protecting licensees in nearby spectrum from harmful interference, some of whom may be small entities, and meet the statutory requirements of the Spectrum Act. In response to comments to the *AWS–3 NPRM* urging that an interoperability requirement is necessary to prevent the large national carriers from leaving certain AWS–3 spectrum blocks ''orphaned'' (not included in voluntary industry standards) for small and regional carriers that lack sufficient market power to drive device development, the

Report and Order also adopts a requirement that mobile and portable stations that operate on any portion of frequencies in the paired 1755–1780 MHz and 2155–2180 MHz band must be capable of operating on all frequencies in the paired 1710–1780 MHz and 2110–2180 MHz band, using the same air interfaces that the equipment utilizes on any frequencies in the paired 1710–1780 MHz and 2110–2180 MHz band. In response to comments seeking smaller spectrum block sizes and license areas (including from commenters that may be or may represent small entities), the Commission is licensing adopted several 5 megahertz spectrum blocks and one 5 megahertz paired block will be licensed by CMAs.

249. The *Report and Order* provides AWS–3 licensees with the flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum, which is consistent with other spectrum allocated or designated for licensed fixed and mobile services, *e.g.,* AWS–1. The *Report and Order* further provides for licensing of this spectrum under the Commission's market-oriented part 27 rules. This includes applying the Commission's secondary market policies and rules to all transactions involving the use of AWS–3 bands, which will provide greater predictability and regulatory parity with bands licensed for mobile broadband service. These rules should make it easier for AWS–3 providers to enter secondary market arrangements involving use of their spectrum. The secondary market rules apply equally to all entities, whether small or large. As a result, we believe that this will provide an economic benefit to small entities by making it easier for entities, whether large or small, to enter into secondary market arrangements for AWS–3 spectrum.

250. The *Report and Order* adopts rules pertaining to how the AWS–3 licenses will be assigned, including rules to assist small entities in competitive bidding. Specifically, small businesses will have available a bidding credit of 15 percent and very small businesses a bidding credit of 25 percent. Providing small businesses and very small businesses with bidding credits will provide an economic benefit to small entities by making it easier for small entities to acquire spectrum or access to spectrum in these bands.

251. Federal Rules that May Duplicate, Overlap, or Conflict with the Rules None.

C. Paperwork Reduction Act Analysis

252. This document contains modified 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 or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, *see* 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

253. In this present document, we have assessed the effects of the policies adopted in the Report and Order with regard to information collection burdens on small business concerns, and find that these policies will benefit many companies with fewer than 25 employees because the revisions we adopt should provide small entities with more information, more flexibility, and more options for gaining access to valuable spectrum. In addition, we have described impacts that might affect small businesses, which includes most businesses with fewer than 25 employees, in the FRFA.

IV. Ordering Clauses

254. Accordingly, *it is ordered,* pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, and sections 6003, 6004, and 6401 of the Middle Class Tax Relief Act of 2012, Public Law 112–96, 126 Stat. 156, 47 U.S.C. 151, 152, 154(i), 201, 301, 302(a), 303, 307, 308, 309, 310, 316, 319, 324, 332, 333, 1403, 1404, and 1451, that the *Report and Order* is hereby adopted.

255. *It is further ordered* that parts 1, 2 and 27 of the Commission's rules, 47 CFR parts 1, 2 and 27, are amended, effective July 7, 2014 except as otherwise provided herein. It is our intention in adopting these rule changes that, if any provision of the rules, or the application thereof to any person or circumstance, are held to be unlawful, the remaining portions of the rules not deemed unlawful, and the application of such rules to other persons or circumstances, shall remain in effect to the fullest extent permitted by law. The Final Rules that we are adopting also include several non-substantive revisions to the rules as follows: We are moving from 47 CFR 1.949(c) to 47 CFR 27.14(q) the criteria for renewal for AWS–4 with one revision (changing ''*e.g.*'' to ''including'' to conform the language to the same rule that we are adopting today for AWS–3. We also make this same, one-word revision to § 27.14(r)(6)(i) for 1915–1920 MHz and 1995–2000 MHz. We delete ''total'' in § 27.14(r)(1) and correct ''areas'' to ''area'' in § 27.14(r)(4). Finally, in 47 CFR 27.53, we redesignate paragraphs (d) through (m) as paragraphs (e) through (n) and reserve paragraph (d). This revision restores certain technical provisions to longstanding letter assignments that are often cited in equipment certification exhibits. Because of the non-substantive nature of these revisions, notice and comment are unnecessary. 5 U.S.C. 553(b)(B).

256. *It is further ordered* that the amendments, adopted above and specified in the final rules section, to §§ 2.1033(c)(19)(i)–(ii); 27.14(k), (s); 27.17(c); 27.50(d)(3); 27.1131; 27.1132; 27.1134(c), (f) of the Commission's rules, 47 CFR 2.1033(c)(19)(i)–(ii); 27.14(k), (s); 27.17(c); 27.50(d)(3); 27.1131; 27.1132; 27.1134(c), (f), which contain new or modified information collection requirements that are not effective until approved by the Office of Management and Budget. The Commission will publish a document in the **Federal Register** announcing the effective date for those sections.

257. The effective date of the amendment to 47 CFR 2.106 adding Fixed and Mobile allocations for the 2025–2110 MHz band to the Federal Table of Frequency Allocations will become effective after the Commission publishes a document in the **Federal Register** announcing the relevant effective date.

258. *It is further ordered* that the Final Regulatory Flexibility Analysis hereto *is adopted.*

259. *It is further ordered* that, pursuant to section 801(a)(1)(A) of the Congressional Review Act, 5 U.S.C. 801(a)(1)(A), the Commission shall send a copy of the *Report and Order* to Congress and to the Government Accountability Office.

260. *It is further ordered* that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, *shall send* a copy of the *Report and Order,* including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

List of Subjects

47 CFR Parts 1 and 2

Administrative practice and procedure, Reporting and recordkeeping requirements, Telecommunications.

47 CFR Part 27

Communications common carriers, Radio.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 1, 2, and 27 as follows:

PART 1—PRACTICE AND PROCEDURE

■ 1. The authority citation for part 1 continues to read as follows:

Authority: 15 U.S.C. 79 *et seq.;* 47 U.S.C. 151, 154(i), 154(j), 155, 157, 225, 227, 303(r), 309, 1403, 1404, and 1451.

§ 1.949 [Amended]

■ 2. Section 1.949 is amended by removing paragraph (c).

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

■ 3. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

■ 4. Section 2.106 is amended by revising the Table of Frequency Allocations as follows:

■ a. Revise pages 28, 35, and 36.

■ b. In the list of United States (US) Footnotes, add footnotes US88, US91, US92, and US289; and remove footnotes US201 and US393.

■ c. In the list of Non-Federal Government (NG) Footnotes, add footnote NG41 and remove footnotes NG153, NG177, and NG178.

■ d. In the list of Federal Government (G) Footnotes, remove footnote G118.

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

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456-459 FIXED MOBILE 5.286AA 5.271 5.287 5.288			456-459 5.287 US64 US288	456-460 FIXED LAND MOBILE	Public Mobile (22) Maritime (80) Private Land Mobile (90) MedRadio (95I)
459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460		
460-470 FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth) 5.287 5.288 5.289 5.290			460-470 Meteorological-satellite (space-to-Earth) 5.287 US73 US209 US288 US289	460-462.5375 FIXED LAND MOBILE US209 US289 NG124	Private Land Mobile (90)
				462.5375-462.7375 LAND MOBILE US289	Personal Radio (95)
				462.7375-467.5375 FIXED LAND MOBILE 5.287 US73 US209 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
				467.5375-467.7375 LAND MOBILE 5.287 US288 US289	Maritime (80) Personal Radio (95)
				467.7375-470 FIXED LAND MOBILE US73 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
470-790 BROADCASTING 5.149 5.291A 5.294 5.296 5.300 5.302 5.304 5.306 5.311A 5.312	470-512 BROADCASTING Fixed Mobile 5.292 5.293	470-585 FIXED MOBILE BROADCASTING 5.291 5.298	470-608	470-512 FIXED LAND MOBILE BROADCASTING NG5 NG14 NG66 NG115 NG149	Public Mobile (22) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H) Private Land Mobile (90)
	512-608 BROADCASTING 5.297	585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307		512-608 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
	608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space)		608-614 LAND MOBILE (medical telemetry and medical telecommand) RADIO ASTRONOMY US74 US246		Personal Radio (95)
	614-698 BROADCASTING Fixed Mobile 5.293 5.309 5.311A	610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING 5.149 5.305 5.306 5.307 5.311A 5.320	614-698	614-698 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)

Table of Frequency Allocations	1670-2200 MHz (UHF)	Page 35

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1670-1675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.341 5.379D 5.379E 5.380A			1670-1675 5.341 US211 US362	1670-1675 FIXED MOBILE except aeronautical mobile 5.341 US211 US362	Wireless Communications (27)
1675-1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			1675-1695 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) US88 5.341 US211 US289		
1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		1695-1710 METEOROLOGICAL-SATELLITE (space-to-Earth) US88 5.341	1695-1710 FIXED MOBILE except aeronautical mobile 5.341 US88	Wireless Communications (27)
1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341		1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384			
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B 5.149 5.341 5.385 5.386 5.387 5.388			1710-1761 5.341 US91 US378 US385 1761-1780 SPACE OPERATION (Earth-to-space) G42 US91 1780-1850 FIXED MOBILE SPACE OPERATION (Earth-to-space) G42 1850-2025	1710-1780 FIXED MOBILE 5.341 US91 US378 US385 1780-1850 1850-2000 FIXED MOBILE	RF Devices (15) Personal Communications (24) Wireless Communications (27) Fixed Microwave (101)
1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B 5.388			

1970-1980 FIXED MOBILE 5.388A 5.388B 5.388					
1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F				2000-2020 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	Satellite Communications (25) Wireless Communications (27)
2010-2025 FIXED MOBILE 5.388A 5.388B 5.388	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.388 5.389C 5.389E	2010-2025 FIXED MOBILE 5.388A 5.388B 5.388		2020-2025 FIXED MOBILE	
2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392			2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392 US90 US92 US222 US346 US347	2025-2110 FIXED NG118 MOBILE 5.391 5.392 US90 US92 US222 US346 US347	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388			2110-2120 US252	2110-2120 FIXED MOBILE US252	Public Mobile (22) Wireless Communications (27) Fixed Microwave (101)
2120-2170 FIXED MOBILE 5.388A 5.388B 5.388	2120-2160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388 2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E	2120-2170 FIXED MOBILE 5.388A 5.388B 5.388	2120-2200	2120-2180 FIXED MOBILE NG41	
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Wireless Communications (27)

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United States (US) Footnotes

* * * * *

US88 In the bands 1675–1695 MHz and 1695–1710 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1695–1710 MHz by the fixed and mobile except aeronautical mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1695–1710 MHz must be successfully coordinated prior to operation as follows: (i) All base stations within the 27 protection zones listed in paragraph (b) that enable mobiles to operate at a maximum e.i.r.p. of 20 dBm, and (ii) nationwide for base stations that enable mobiles to operate with a maximum e.i.r.p. greater than 20 dBm, up to a maximum e.i.r.p. of 30 dBm, unless otherwise specified by Commission rule, order, or notice.

(b) Forty-seven Federal earth stations located within the protection zones listed below operate on a co-equal, primary basis with AWS operations. All other Federal earth stations operate on a secondary basis.

(1) Protection zones for Federal earth stations receiving in the band 1695–1710 MHz:

State	Location	Latitude	Longitude	Radius (km)
AK	Barrow	71°19′22″	156°36′41″	35
AK	Elmendorf AFB	61°14′08″	149°55′31″	98
AK	Fairbanks	64°58′22″	147°30′02″	20
AZ	Yuma	32°39′24″	114°36′22″	95
CA	Monterey	36°35′34″	121°51′20″	76
CA	Twenty-Nine Palms	34°17′46″	116°09′44″	80
FL	Miami	25°44′05″	080°09′45″	51
HI	Hickam AFB	21°19′18″	157°57′30″	28
MD	Suitland	38°51′07″	076°56′12″	98
MS	Stennis Space Center	30°21′23″	089°36′41″	57
SD	Sioux Falls	43°44′09″	096°37′33″	42
VA	Wallops Island	37°56′45″	075°27′45″	30
GU	Andersen AFB	13°34′52″	144°55′28″	42

(2) Protection zones for Federal earth stations receiving in the band 1675–1695 MHz:

State	Location	Latitude	Longitude	Radius (km)
CA	Sacramento	38°35′50″	121°32′34″	55
CO	Boulder	39°59′26″	105°15′51″	02
ID	Boise	43°35′42″	116°13′49″	39
IL	Rock Island	41°31′04″	090°33′46″	19
MO	Kansas City	39°16′40″	094°39′44″	40
MO	St. Louis	38°35′26″	090°12′25″	34
MS	Columbus Lake	33°32′04″	088°30′06″	03
MS	Vicksburg	32°20′47″	090°50′10″	16
NE	Omaha	41°20′56″	095°57′34″	30
OH	Cincinnati	39°06′10″	084°30′35″	32
OK	Norman	35°10′52″	097°26′21″	03
TN	Knoxville	35°57′58″	083°55′13″	50
WV	Fairmont	39°26′02″	080°11′33″	04
PR	Guaynabo	18°25′26″	066°06′50″	48

Note: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entry is specified in terms of East longitude.

* * * * *

US91 In the band 1755–1780 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1755–1780 MHz by the fixed and mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1755–1780 MHz must be successfully coordinated on a nationwide basis prior to operation, unless otherwise specified by Commission rule, order, or notice.

(b) In the band 1755–1780 MHz, the Federal systems listed below operate on a co-equal, primary basis with AWS stations. All other Federal stations in the fixed and mobile services identified in an approved Transition Plan will operate on a primary basis until reaccommodated in accordance with 47 CFR part 301.

(1) Joint Tactical Radio Systems (JTRS) may operate indefinitely at the following locations:

State	Training area	Latitude	Longitude
AZ	Yuma Proving Ground	33°12′14″	114°13′47″
CA	Fort Irwin	35°23′19″	116°37′43″
LA	Fort Polk	31°08′38″	093°06′52″

State	Training area	Latitude	Longitude
NC	Fort Bragg (including Camp MacKall)	35°09′04″	078°59′13″
NM	White Sands Missile Range	32°52′50″	106°23′10″
TX	Fort Hood	31°13′50″	097°45′23″

(2) Air combat training system (ACTS) stations may operate on two frequencies within two geographic zones that are defined by the following coordinates:

Geographic zone	Latitude	Longitude
Polygon 1	41°52′00″ 42°00′00″ 43°31′13″	117°49′00″ 115°05′00″ 115°47′18″
Polygon 2	47°29′00″ 48°13′00″ 47°30′00″ 44°11′00″	111°22′00″ 110°00′00″ 107°00′00″ 103°06′00″

Note: ACTS transmitters may cause interference to AWS base stations between separation distances of 285 km (minimum) and 415 km (maximum).

(3) In the sub-band 1761–1780 MHz, Federal earth stations in the space operation service (Earth-to-space) may transmit at the following 25 sites and non-Federal base stations must accept harmful interference caused by the operation of these earth stations:

State	Site	Latitude	Longitude
AK	Fairbanks	64°58′20″	147°30′59″
CA	Camp Parks	37°43′51″	121°52′50″
CA	Huntington Beach	33°44′50″	118°02′04″
CA	Laguna Peak	34°06′31″	119°03′53″
CA	Monterey	36°35′42″	121°52′28″
CA	Sacramento	38°39′59″	121°23′33″
CA	Vandenberg AFB	34°49′23″	120°30′07″
CO	Buckley	39°42′55″	104°46′29″
CO	Schriever AFB	38°48′22″	104°31′41″
FL	Cape Canaveral AFS	28°29′09″	080°34′33″
FL	Cape GA, CCAFB	28°29′03″	080°34′21″
FL	JIATF–S Key West	24°32′36″	081°48′17″
HI	Kaena Point, Oahu	21°33′43″	158°14′31″
MD	Annapolis	38°59′27″	076°29′25″
MD	Blossom Point	38°25′53″	077°05′06″
MD	Patuxent River NAS	38°16′28″	076°24′45″
ME	Prospect Harbor	44°24′16″	068°00′46″
NC	Ft Bragg	35°09′04″	078°59′13″
NH	New Boston AFS	42°56′46″	071°37′44″
NM	Kirtland AFB	34°59′06″	106°30′28″
TX	Ft Hood	31°08′57″	097°46′12″
VA	Fort Belvoir	38°44′04″	077°09′12″
WA	Joint Base Lewis-McChord	47°06′11″	122°33′11″
GU	Andersen AFB	13°36′54″	144°51′22″
GU	NAVSOC Det. Charlie	13°34′58″	144°50′32″

Note: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entries are specified in terms of East longitude. Use at Cape Canaveral AFS is restricted to launch support only. If required, successfully coordinated with all affected AWS licensees, and authorized by NTIA, reasonable modifications of these grandfathered Federal systems beyond their current authorizations or the addition of new earth station locations may be permitted. The details of the coordination must be filed with NTIA and FCC.

(c) In the band 1755–1780 MHz, the military services may conduct Electronic Warfare (EW) operations on Federal ranges and within associated airspace on a non-interference basis with respect to non-Federal AWS operations and shall not constrain implementation of non-Federal AWS operations. This use is restricted to Research, Development, Test and Evaluation (RDT&E), training, and Large Force Exercise (LFE) operations.

US92 In the band 2025–2110 MHz, Federal use of the co-primary fixed and mobile services is restricted to the military services and the following provisions apply:

(a) Federal use shall not cause harmful interference to, nor constrain the deployment and use of the band by, the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations, coordination is required in accordance with a Memorandum of Understanding between Federal and non-Federal fixed and mobile operations. Non-Federal licensees shall make all reasonable efforts to accommodate military mobile and fixed operations; however, the use of the band 2025–2110 MHz by the non-Federal fixed and mobile services has priority over military fixed and mobile operations.

(b) Military stations should, to the extent practicable, employ frequency agile technologies and techniques, including the capability to tune to other frequencies and the use of a modular retrofit capability, to facilitate sharing of this band with incumbent Federal and non-Federal operations.

* * * * *

US289 In the bands 460–470 MHz and 1690–1695 MHz, the following provisions shall apply:

(a) In the band 460–470 MHz, space stations in the Earth exploration-satellite service (EESS) may be authorized for space-to-Earth transmissions on a secondary basis with respect to the fixed and mobile services.

When operating in the meteorological-satellite service, such stations shall be protected from harmful interference from other EESS applications. The power flux density produced at the Earth's surface by any space station in this band shall not exceed −152 dBW/m²/4 kHz.

(b) In the band 1690–1695 MHz, EESS applications, other than the meteorological-satellite service, may also be used for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table of Frequency Allocations.

* * * * *

Non-Federal Government (NG) Footnotes

* * * * *

NG41 In the band 2120–2180 MHz, the following provisions shall apply to grandfathered stations in the fixed service:

(a) In the sub-band 2160–2162 MHz, authorizations in the Broadband Radio Service (BRS) applied for after January 16, 1992 shall be granted on a secondary basis to Advanced Wireless Services (AWS). In the band 2150–2162 MHz, all other BRS stations shall operate on a primary basis until December 9, 2021, and may continue to operate on a secondary basis thereafter, unless said facility is relocated in accordance with 47 CFR 27.1250 through 27.1255.

(b) In the sub-band 2160–2180 MHz, fixed stations authorized pursuant to 47 CFR part 101 may continue to operate on a secondary basis to AWS.

* * * * *

■ 5. Section 2.1033 is amended by adding paragraph (c)(19) to read as follows:

§ 2.1033 Application for certification.

* * * * *

(c) * * *

(19) Applications for certification of equipment operating under part 27 of this chapter, that a manufacturer is seeking to certify for operation in the:

(i) 1755–1780 MHz, 2155–2180 MHz, or both bands shall include a statement indicating compliance with the pairing of 1710–1780 and 2110–2180 MHz specified in §§ 27.5(h) and 27.75 of this chapter.

(ii) 1695–1710 MHz, 1755–1780 MHz, or both bands shall include a statement indicating compliance with § 27.77 of this chapter.

* * * * *

PART 27—MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

■ 6. The authority citation for part 27 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302a, 303, 307, 309, 332, 336, 337, 1403, 1404, and 1451 unless otherwise noted.

■ 7. Section 27.1 is amended by adding paragraphs (b)(11) through (13) to read as follows:

§ 27.1 Basis and purpose.

* * * * *

(b) * * *

(11) 1695–1710 MHz.

(12) 1755–1780 MHz.

(13) 2155–2180 MHz.

* * * * *

■ 8. Section 27.5 is amended by revising paragraph (h) to read as follows:

§ 27.5 Frequencies

* * * * *

(h) *1710–1755 MHz, 2110–2155 MHz, 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands.* The following frequencies are available for licensing pursuant to this part in the 1710–1755 MHz, 2110–2155 MHz, 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands:

(1) Four paired channel blocks of 10 megahertz each are available for assignment as follows:

Block A: 1710–1720 MHz and 2110–2120 MHz;

Block B: 1720–1730 MHz and 2120–2130 MHz;

Block F: 1745–1755 MHz and 2145–2155 MHz; and

Block J: 1770–1780 MHz and 2170–2180 MHz.

(2) Six paired channel blocks of 5 megahertz each are available for assignment as follows:

Block C: 1730–1735 MHz and 2130–2135 MHz;

Block D: 1735–1740 MHz and 2135–2140 MHz;

Block E: 1740–1745 MHz and 2140–2145 MHz;

Block G: 1755–1760 MHz and 2155–2160 MHz;

Block H: 1760–1765 MHz and 2160–2165 MHz; and

Block I: 1765–1770 MHz and 2165–2170 MHz.

(3) One unpaired block of 5 megahertz and one unpaired block of 10 megahertz each are available for assignment as follows:

Block A1: 1695–1700 MHz

Block B1: 1700–1710 MHz

Note to paragraph (h). Licenses to operate in the 1695–1710 MHz and 1755–1780 MHz bands are subject to the condition that the licensee must not cause harmful interference to an incumbent Federal entity relocating from these bands under an approved Transition Plan. This condition remains in effect until NTIA terminates the applicable authorization of the incumbent Federal entity.

* * * * *

■ 9. Section 27.6 is amended by adding paragraph (k) to read as follows:

§ 27.6 Service areas.

* * * * *

(k) *1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands.* AWS service areas for the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands are as follows:

(1) Service areas for Block G (1755–1760 MHz and 2155–2160 MHz) are based on cellular markets comprising Metropolitan Statistical Areas (MSAs) and Rural Service Areas (RSAs) as defined by Public Notice Report No. CL–92–40 ''Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties,'' dated January 24, 1992, DA 92–109, 7 FCC Rcd 742 (1992), with the following modifications:

(i) The service areas of cellular markets that border the U.S. coastline of the Gulf of Mexico extend 12 nautical miles from the U.S. Gulf coastline.

(ii) The service area of cellular market 306 that comprises the water area of the Gulf of Mexico extends from 12 nautical miles off the U.S. Gulf coast outward into the Gulf.

(2) Service areas for Blocks H (1760–1765 MHz and 2160–2165 MHz), I (1765–1770 MHz and 2165–2170 MHz), J (1770–1780 MHz and 2170–2180 MHz), A1 (1695–1700 MHz) and B1 (1700–1710 MHz) are based on Economic Areas (EAs) as defined in paragraph (a) of this section.

■ 10. Section 27.11is amended by adding paragraph (j) to read as follows:

§ 27.11 Initial authorization.

* * * * *

(j) *1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands.* (1) Initial authorizations for the 1695–1710 MHz band shall be based on the frequency blocks specified in § 27.5(h)(3) and the corresponding service area specified in § 27.6(k)(2).

(2) Initial authorizations for the 1755–1780 MHz and 2155–2180 MHz shall be based on the paired frequency blocks specified in § 27.5(h)(1) and (2) and the corresponding service areas specified in § 27.6(k)(1) and (2).

■ 11. Section 27.13(k) is added to read as follows:

§ 27.13 License period.

* * * * *

(k) *1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands.* Authorizations for the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands will have a term not to exceed twelve (12) years from the date of issuance and ten (10) years from the date of any subsequent license renewal.

■ 12. Section 27.14 is amended by revising paragraphs (a), (f), and (k), adding paragraph (q)(7), revising paragraphs (r)(1) and (4) and (r)(6)(i), and adding paragraph (s) to read as follows:

§ 27.14 Construction requirements; Criteria for renewal.

(a) AWS and WCS licensees, with the exception of WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, Block C, C1 or C2 in the 746–757 MHz and 776–787 MHz bands, Block A in the 2305–2310 MHz and 2350–2355 MHz bands, Block B in the 2310–2315 MHz and 2355–2360 MHz bands, Block C in the 2315–2320 MHz band, and Block D in the 2345–2350 MHz band, and with the exception of licensees holding AWS authorizations in the 1915–1920 MHz and 1995–2000 MHz bands, the 2000–2020 MHz and 2180–2200 MHz bands, or 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands, must, as a performance requirement, make a showing of ''substantial service'' in their license area within the prescribed license term set forth in § 27.13. ''Substantial service'' is defined as service which is sound, favorable and substantially above a level of mediocre service which just might minimally warrant renewal. Failure by any licensee to meet this requirement will result in forfeiture of the license and the licensee will be ineligible to regain it.

* * * * *

(f) Comparative renewal proceedings do not apply to WCS licensees holding authorizations for the 698–746 MHz, 747–762 MHz, and 777–792 MHz bands or licensees holding AWS authorizations for the 1915–1920 MHz and 1995–2000 MHz bands or the 2000–2020 MHz and 2180–2200 MHz bands, or the 1695–1710 MHz, or the 1755–1780 MHz and 2155–2180 MHz bands. These licensees must file a renewal application in accordance with the provisions set forth in § 1.949 of this chapter.

* * * * *

(k) Licensees holding WCS or AWS authorizations in the spectrum blocks enumerated in paragraphs (g), (h), (i), (q), (r) or (s) of this section, including any licensee that obtained its license pursuant to the procedures set forth in paragraph (j) of this section, shall demonstrate compliance with performance requirements by filing a construction notification with the Commission, within 15 days of the expiration of the applicable benchmark, in accordance with the provisions set forth in § 1.946(d) of this chapter. The licensee must certify whether it has met the applicable performance requirements. The licensee must file a description and certification of the areas for which it is providing service. The construction notifications must include electronic coverage maps, supporting technical documentation and any other information as the Wireless Telecommunications Bureau may prescribe by public notice.

* * * * *

(q) * * *

(7) *Renewal showing.* An applicant for renewal of a geographic-area authorization in the 2000–2020 MHz and 2180–2200 MHz service bands must make a renewal showing, independent of its performance requirements, as a condition of renewal. The showing must include a detailed description of the applicant's provision of service during the entire license period and address:

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

(ii) The date service commenced, whether service was ever interrupted, and the duration of any interruption or outage;

(iii) The extent to which service is provided to rural areas;

(iv) The extent to which service is provided to qualifying tribal land as defined in § 1.2110(f)(3)(i) of this chapter; and

(v) Any other factors associated with the level of service to the public.

(r) * * *

(1) A licensee shall provide signal coverage and offer service within four (4) years from the date of the initial license to at least forty (40) percent of the population in each of its licensed areas (''Interim Buildout Requirement'').

* * * * *

(4) If a licensee fails to establish that it meets the Final Buildout Requirement for a particular licensed area, its authorization for each license area in which it fails to meet the Final Buildout Requirement shall terminate automatically without Commission action and the licensee will be ineligible to regain it if the Commission makes the license available at a later date.

* * * * *

(6) * * *

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

* * * * *

(s) The following provisions apply to any licensee holding an AWS authorization in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands:

(1) A licensee shall provide reliable signal coverage and offer service within six (6) years from the date of the initial license to at least forty (40) percent of the population in each of its licensed areas (''Interim Buildout Requirement'').

(2) A licensee shall provide reliable signal coverage and offer service within twelve (12) years from the date of the initial license to at least seventy-five (75) percent of the population in each of its licensed areas (''Final Buildout Requirement'').

(3) If a licensee fails to establish that it meets the Interim Buildout Requirement for a particular licensed area, then the Final Buildout Requirement (in this paragraph (s)) and the AWS license term (as set forth in § 27.13(k)) for each license area in which it fails to meet the Interim Buildout Requirement shall be accelerated by two (2) years (from twelve (12) to ten (10) years).

(4) If a licensee fails to establish that it meets the Final Buildout Requirement for a particular licensed area, its authorization for each license area in which it fails to meet the Final Buildout Requirement shall terminate automatically without Commission action and the licensee will be ineligible to regain it if the Commission makes the license available at a later date.

(5) To demonstrate compliance with these performance requirements, licensees shall use the most recently available U.S. Census Data at the time of measurement and shall base their measurements of population served on areas no larger than the Census Tract level. The population within a specific Census Tract (or other acceptable identifier) will be deemed served by the licensee only if it provides signal coverage to and offers service within the specific Census Tract (or other acceptable identifier). To the extent the Census Tract (or other acceptable identifier) extends beyond the boundaries of a license area, a licensee with authorizations for such areas may include only the population within the Census Tract (or other acceptable identifier) towards meeting the performance requirement of a single,

individual license. For the Gulf of Mexico license area, the licensee shall demonstrate compliance with these performance requirements, using off-shore platforms, including production, manifold, compression, pumping and valving platforms as a proxy for population in the Gulf of Mexico.

(6) An applicant for renewal of a license covered by paragraph (s) of this section must make a renewal showing, independent of its performance requirements, as a condition of each renewal. The showing must include a detailed description of the applicant's provision of service during the entire license period and address:

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

(ii) The date service commenced, whether service was ever interrupted, and the duration of any interruption or outage;

(iii) The extent to which service is provided to rural areas;

(iv) The extent to which service is provided to qualifying tribal land as defined in § 1.2110(f)(3)(i) of this chapter; and

(v) Any other factors associated with the level of service to the public.

■ 13. Section 27.15 is amended by revising the first sentence of paragraph (d)(1)(i), paragraph (d)(1)(iii), the first sentence of paragraph (d)(2)(i), and paragraph (d)(2)(iii) to read as follows:

§ 27.15 Geographic partitioning and spectrum disaggregation.

* * * * *

(d) * * *

(1) * * *

(i) Except for WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, or Blocks C, C1, and C2 in the 746–757 MHz and 776–787 MHz bands; and for licensees holding AWS authorizations in the 1915–1920 MHz and 1995–2000 MHz bands, the 2000–2020 MHz and 2180–2200 MHz bands; or the 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands, the following rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in § 27.14. * * *

* * * * *

(iii) For licensees holding AWS authorizations in the 1915–1920 MHz and 1995–2000 MHz bands, or the 2000–2020 MHz and 2180–2200 MHz bands, or the 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in § 27.14. Each party to a geographic partitioning must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a partitioner or partitionee fails to meet any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in § 27.14(q) for 2000–2020 MHz and 2180–2200 MHz licenses, those enumerated in § 27.14(r) for 1915–1920 MHz and 1995–2000 MHz licenses, and those enumerated in § 27.14(s) for 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz licenses.

(2) * * *

(i) Except for WCS licensees holding authorizations for Block A in the 698–704 MHz and 728–734 MHz bands, Block B in the 704–710 MHz and 734–740 MHz bands, Block E in the 722–728 MHz band, or Blocks C, C1, and C2 in the 746–757 MHz and 776–787 MHz bands; and for licensees holding AWS authorizations in the 1915–1920 MHz and 1995–2000 MHz bands, the 2000–2020 MHz and 2180–2200 MHz bands or the 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands; the following rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in § 27.14. * * *

* * * * *

(iii) For licensees holding AWS authorizations in the 1915–1920 MHz and 1995–2000 MHz bands, or the 2000–2020 MHz and 2180–2200 MHz bands, or the 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in § 27.14. Each party to a spectrum disaggregation must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a disaggregator or a disaggregatee fails to meet any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in § 27.14(q) for 2000–2020 MHz and 2180–2200 MHz licenses, those enumerated in § 27.14(r) for 1915–1920 MHz and 1995–2000 MHz licenses, and those enumerated in § 27.14(s) for 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz.

■ 14. Section 27.17 is revised to read as follows:

§ 27.17 Discontinuance of service in the 1695–1710 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2155–2180 MHz, and 2180–2200 MHz bands.

(a) *Termination of authorization.* An AWS authorization in the 1695–1710 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2155–2180 MHz, and 2180–2200 MHz bands will automatically terminate, without specific Commission action, if the licensee permanently discontinues service either during the initial license term or during any subsequent license term, as follows:

(1) After the interim buildout deadline as specified in § 27.14(r) or (s), as applicable (where the licensee meets the interim buildout requirement), or after the accelerated final buildout deadline (where the licensee failed to meet the interim buildout requirement).

(2) After the AWS–4 final buildout deadline as specified in § 27.14(q)(1) (where the licensee meets the AWS–4 interim buildout requirement), or after the accelerated final buildout deadline specified in § 27.14(q)(3) (where the licensee failed to meet its AWS–4 interim buildout requirement).

(b) For licensees with common carrier or non-common carrier regulatory status that hold AWS authorizations in the 1695–1710 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2155–2180 MHz, and 2180–2200 MHz bands, permanent discontinuance of service is defined as 180 consecutive days during which a licensee does not provide service to at least one subscriber that is not affiliated with, controlled by, or related to the licensee. For licensees with private, internal regulatory status that hold AWS authorizations in the 1695–1710 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2155–2180 MHz, and 2180–2200 MHz bands, permanent discontinuance of service is defined as 180 consecutive days during which a licensee does not operate.

(c) *Filing Requirements.* A licensee that holds an AWS authorization in the 1695–1710 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2155–2180 MHz, and 2180–2200 MHz bands that permanently discontinues service as defined in this section must notify the Commission of the discontinuance within 10 days by filing FCC Form 601 or 605 requesting license cancellation. An authorization will automatically terminate, without specific Commission action, if service is permanently discontinued as defined in this section, even if a licensee fails to file the required form requesting license cancellation.

■ 15. Section 27.50 is amended by revising paragraph (d) to read as follows:

§ 27.50 Power limits and duty cycle.

* * * * *

(d) The following power and antenna height requirements apply to stations transmitting in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz and 2180–2200 MHz bands:

(1) The power of each fixed or base station transmitting in the 1995–2000 MHz, 2110–2155 MHz, 2155–2180 MHz or 2180–2200 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to:

(i) An equivalent isotropically radiated power (EIRP) of 3280 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 3280 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(2) The power of each fixed or base station transmitting in the 1995–2000 MHz, the 2110–2155 MHz 2155–2180 MHz band, or 2180–2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(3) A licensee operating a base or fixed station in the 2110–2155 MHz band utilizing a power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025–2110 MHz band. A licensee operating a base or fixed station in the 2110–2180 MHz band utilizing power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must be coordinated in advance with the following licensees authorized to operate within 120 kilometers (75 miles) of the base or fixed station operating in this band: All Broadband Radio Service (BRS) licensees authorized under this part in the 2155–2160 MHz band and all advanced wireless services (AWS) licensees authorized to operate on adjacent frequency blocks in the 2110–2180 MHz band.

(4) Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710–1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

* * * * *

■ 16. Section 27.53 is amended by redesignating paragraphs (d) through (m) as paragraphs (e) through (n), adding and reserving new paragraph (d), and revising newly redesignated paragraph (h)(1) to read as follows:

§ 27.53 Emission limits.

* * * * *

(h) * * *

(1) *General protection levels.* Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}$ (P) dB.

* * * * *

■ 17. Section 27.55 is amended by revising paragraph (a)(1) to read as follows:

§ 27.55 Power strength limits.

(a) * * *

(1) 1995–2000 MHz, 2110–2155, 2155–2180, 2180–2200, 2305–2320, and 2345–2360 MHz bands: 47 dBμV/m.

* * * * *

■ 18. Section 27.57 is amended by revising paragraph (c) to read as follows:

§ 27.57 International coordination.

* * * * *

(c) Operation in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 MHz bands is subject to international agreements with Mexico and Canada.

■ 19. Section 27.75 is added to read as follows:

§ 27.75 Basic interoperability requirement.

(a)(1) Mobile and portable stations that operate on any portion of frequencies in the paired 1755–1780 MHz and 2155–2180 MHz band must be capable of operating on all frequencies in the paired 1710–1780 MHz and 2110–2180 MHz band, using the same air interfaces that the equipment utilizes on any frequencies in the paired 1710–1780 MHz and 2110–2180 MHz band.

(2) [Reserved]

(b) The basic interoperability requirement in paragraph (a) of this section does not require a licensee to use any particular industry standard. Devices may also contain functions that are not operational in U.S. Territories.

■ 20. Section 27.77 is added to read as follows:

§ 27.77 Restriction on mobile and portable equipment in the 1695–1710 MHz and 1755–1780 MHz bands.

Mobile and portable stations in the 1695–1710 MHz and 1755–1780 MHz bands may operate only when under the control of a base station. Base stations that enable mobile or portable equipment to operate in the 1695–1710 MHz and 1755–1780 MHz band are subject to prior coordination requirements. See § 27.1134 (Protection of Federal Government operations).

■ 21. Part 27 is amended by revising the heading for subpart L to read as follows:

Subpart L—1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 2110–2155 MHz, 2155–2180 MHz, 2180–2200 MHz Bands

■ 22. Section 27.1105 is added to read as follows:

§ 27.1105 1695–1710 MHz, 1755–1780 MHz and 2155–2180 MHz bands subject to competitive bidding.

Mutually exclusive initial applications for 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz band licenses are subject to competitive bidding. The general competitive bidding procedures set forth in 47 CFR part 1, subpart Q will apply unless otherwise provided in this subpart.

■ 23. Section 27.1106 is added to read as follows:

§ 27.1106 Designated Entities in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz bands.

Eligibility for small business provisions:

(a) *Small business.* (1) A small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities with which it has an attributable material relationship, has average gross revenues not exceeding $40 million for the preceding three (3) years.

(2) A very small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities

with which it has an attributable material relationship, has average gross revenues not exceeding $15 million for the preceding three (3) years.

(b) *Bidding credits.* A winning bidder that qualifies as a small business as defined in this section or a consortium of small businesses may use the bidding credit specified in § 1.2110(f)(2)(iii) of this chapter. A winning bidder that qualifies as a very small business as defined in this section or a consortium of very small businesses may use the bidding credit specified in § 1.2110(f)(2)(ii) of this chapter.

■ 24. Section 27.1111 is revised to read as follows:

§ 27.1111 Relocation of fixed microwave service licensees in the 2110–2150 and 2160–2200 MHz bands.

Part 22, subpart E and part 101, subpart B of this chapter contain provisions governing the relocation of incumbent fixed microwave service licensees in the 2110–2150 MHz and 2160–2200 MHz bands.

■ 25. Section 27.1131 is revised to read as follows:

§ 27.1131 Protection of Part 101 operations.

All AWS licensees, prior to initiating operations from any base or fixed station, must coordinate their frequency usage with co-channel and adjacent-channel incumbent, 47 CFR part 101 fixed-point-to-point microwave licensees operating in the 2110–2150 MHz and 2160–2200 MHz bands. Coordination shall be conducted in accordance with the provisions of § 24.237 of this chapter.

■ 26. Section 27.1132 is amended to read as follows:

§ 27.1132 Protection of incumbent operations in the 2150–2160/62 MHz band.

All AWS licensees, prior to initiating operations from any base or fixed station in the 2110–2180 MHz band, shall follow the provisions of § 27.1255.

■ 27. Section 27.1134 is amended by revising paragraph (c) and adding paragraph (f) to read as follows:

§ 27.1134 Protection of Federal Government operations.

* * * * *

(c) *Protection of Federal operations in the 1675–1710 MHz band.* (1) *27 Protection Zones.* Within 27 Protection Zones, prior to operating a base station that enables mobile or portable stations to transmit in the 1695–1710 MHz band, licensees must successfully coordinate such base station operations with Federal Government entities operating meteorological satellite Earth-station receivers in the 1675–1710 MHz band. See 47 CFR 2.106, footnote US 88, for the 27 Protection Zones and other details.

(2) *Operation outside of 27 Protection Zones.* Non-Federal operations, for mobile and portable stations operating at a maximum EIRP of 20 dBm, are permitted outside of the protection zones without coordination. All non-Federal operations for mobile and portables operating at a maximum EIRP of greater than 20 dBm and up to 30 dBm must be coordinated nationwide. All such operations may not cause harmful interference to the Federal operations protected in 47 CFR 2.106, footnote US 88.

(3) *Interference.* If protected Federal operations receive harmful interference from AWS operations in the 1695–1710 MHz band, an AWS licensee must, upon notification, modify its operations and/or technical parameters as necessary to eliminate the interference.

(4) *Point of contact.* AWS licensees in the 1695–1710 MHz band must provide and maintain a point of contact at all times so that immediate contact can be made should interference against protected Federal sites occur.

(5) *Coordination procedures.* Federal use of the radio spectrum is generally governed by the National Telecommunications and Information Administration (NTIA) while non-Federal use is governed by the Commission. As such, any guidance or details concerning Federal/non-Federal coordination must be issued jointly by NTIA and the Commission. The Commission may jointly issue with NTIA one or more public notices with guidance or details concerning the coordination procedures for the 1695–1710 MHz band.

(6) *Requirements for licensees operating in the 1710–1755 MHz band.* AWS licensees operating fixed stations in the 1710–1755 MHz band, if notified that such stations are causing interference to radiosonde receivers operating in the Meteorological Aids Service in the 1675–1700 MHz band or a meteorological-satellite earth receiver operating in the Meteorological-Satellite Service in the 1675–1710 MHz band, shall be required to modify the stations' location and/or technical parameters as necessary to eliminate the interference.

* * * * *

(f) *Protection of Federal operations in the 1755–1780 MHz band.* The Federal Government operates communications systems in the 1755–1780 MHz band. Certain systems are expected to continue to operate in the band indefinitely. All other operations will be relocating to other frequencies or otherwise cease operations in the 1755–1780 MHz band in accordance with 47 CFR part 301. Until such a time as Federal operations in the 1755–1780 MHz bands vacate this spectrum, AWS licensees shall protect such systems and must accept any interference received from these Federal operations. See 47 CFR 2.106, footnote US 91, for details. AWS licensees must successfully coordinate proposed operations with all Federal incumbents prior to operation as follows:

(1) *Protection Zone(s).* A protection zone is established for each Federal operation pursuant to 47 CFR 2.106, footnote US 91. Unless otherwise specified in later Commission actions, the default protection zone is nationwide. A base station which enables mobile or portable stations to transmit in the 1755–1780 MHz band may not operate within the Protection Zone(s) of a Federal operation until the licensee successfully coordinates such base station operations with Federal Government entities as follows depending on the type of Federal incumbent authorization:

(i) *Federal US&P Assignments.* Each AWS licensee must coordinate with each Federal agency that has U.S. and Possessions (US&P) authority prior to its first operations in its licensed area to reach a coordination arrangement with each US&P agency on an operator-to-operator basis. (Agencies with U.S. and Possessions (US&P) authority do not operate nationwide and may be able to share, prior to relocation, in some areas.)

(ii) *Other Federal Assignments.* Each AWS licensee must successfully coordinate all base station operations within a Protection Zone with the Federal incumbents. The default requirement is a nationwide coordination zone with possible revisions to the Protection Zone and other details to be announced in a Joint FCC/NTIA public notice.

(2) *Interference.* If protected Federal operations receive harmful interference from AWS operations in the 1755–1780 MHz band, an AWS licensee must, upon notification, modify its operations and/or technical parameters as necessary to eliminate the interference.

(3) *Point of contact.* AWS licensees in the 1755–1780 MHz band must provide and maintain a point of contact at all times so that immediate contact can be made should interference against protected Federal operations occur.

(4) *Coordination procedures.* Federal use of the radio spectrum is generally governed by the National Telecommunications and Information Administration (NTIA) while non-Federal use is governed by the Commission. As such, any guidance or details concerning Federal/non-Federal coordination must be issued jointly by NTIA and the Commission. The Commission may jointly issue with NTIA one or more public notices with guidance or details concerning the coordination procedures for the 1755–1780 MHz band.

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