

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Amendment of Parts 15 and 74 of the Rules for Wireless Microphones in the TV Bands, 600 MHz Guard Band, 600 MHz Duplex Gap, and the 941.5- 944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and 7100-7125 MHz Bands)	ET Docket No. 21-115 RM-11821

To: The Commission

**COMMENTS OF THE
SOCIETY OF BROADCAST ENGINEERS, INCORPORATED**

The Society of Broadcast Engineers, Incorporated (“SBE”)¹ hereby respectfully submits its comments in response to the Commission’s Notice of Proposed Rulemaking (“*the Notice*”)² in the instant proceeding, which proposes to revise certain technical rules for operation of part 74 low-power auxiliary station (LPAS) devices, including wireless microphones, so as to permit the use of Wireless Multi-Channel Audio Systems (WMAS), to operate in the broadcast television bands and other part 74 frequency bands on a licensed basis. In the interests of its members in sufficient opportunities and facilities to conduct video and audio program production using wireless microphones (WMs) and LPAS, SBE states as follows:

1. SBE and its members are knowledgeable about the current needs of broadcasters for UHF and other WMs and LPAS in electronic news gathering (ENG) and video and audio program production on a daily basis; the post-UHF auction sufficiency of spectrum for WMs and

¹ SBE is the national association of broadcast engineers and technical communications professionals, with more than 5,000 members worldwide.

² Notice of Proposed Rulemaking, *Amendment of Parts 15 and 74 of the Rules for Wireless Microphones in the TV Bands, 600 MHz Guard Band, 600 MHz Duplex Gap, and the 941.5-944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and 7100-7125 MHz Bands*; FCC 21-46, 86 Fed. Reg. 35046, et seq., released April 22, 2021.

LPAS; and the present level of difficulty in conducting sports, entertainment and newsworthy event program production, audio and video, whether the events are planned or unplanned. SBE is not opposed to the use of WMAS technology in the subject allocations, but (a) the use of WMAS in existing WM and LPAS allocations should be subject to coordination with SBE local market frequency coordinators; (b) WMAS systems should be operated only on a non-interference basis to incumbent WM technologies, especially at UHF, so as to not reduce further the nominal, residual UHF spectrum available for current technology WMs; and (c) WMAS should not be viewed as a replacement for conventional narrowband systems. Finally, the Commission should carefully test and evaluate the increase in the noise floor that might result from the overlay of WMAS on incumbent narrowband WM operation, and the effect of any such noise floor increases on the latter facilities. Reportedly, WMAS has a greater potential for interference than does current narrowband WM technology, and WMAS has not been shown to be compatible with the large deployment of narrowband WMs. SBE endorses the Commission's efforts to encourage spectrum efficiency in the extremely limited BAS allocations available for WMs and other auxiliary facilities. However, SBE urges that the Commission not view this proceeding as a sufficient response to the critical shortage in available spectrum for WMs, especially in the UHF television bands.

2. SBE has long sponsored and conducted - at no cost to anyone - a successful frequency coordination program for broadcast auxiliary (BAS) allocations. The volunteer coordination services in this program include accommodations for WMs and LPAS facilities. SBE therefore has a good understanding of the extent to which WMs and LPAS facilities, displaced first from the 700 MHz band and later from the 600 MHz band, have been accommodated in the residual television broadcast band, between 470 and 608 MHz, post-UHF auction and post-TV band

repack. SBE took no position with respect to the recent petitions of Shure and Sennheiser, which asked the Commission to reconsider its December 8, 2020 decision to *not* dedicate a television broadcast channel in each market for TV White Spaces and WM/LPAS use.³ However, SBE would note its firm belief, based on the extensive, and current experience of its dedicated volunteer frequency coordinators, that: (1) there currently are *severe* spectrum scarcity issues for professional, and especially broadcast WM and LPAS operators; (2) the Commission did not make a sufficient reaccommodation (at UHF or otherwise) for WMs and LPAS' displaced from most of the 614-698 MHz band in 2015 in anticipation of the UHF auction; (3) there is an increasing but unmet need for UHF WM and LPAS spectrum for audio and video sports, event and news production conducted by broadcast engineers regularly, and in many cases daily in all markets; and (4) the implementation of WMAS, even if widespread, will not be sufficient to alleviate this severe spectrum shortage.

3. SBE, while supportive of the authorization for WMAS proposed in this proceeding, urges nevertheless that the Commission consider additional WM spectrum allocations at UHF. In the best interests of the public, which relies heavily on the ability of broadcasters and video production companies to provide audio and video coverage of major news, sports and other events in real time, SBE suggests that the Commission revisit the issue of UHF spectrum available for WM and LPAS operation needed to facilitate and enhance ENG and audio and video program production in addition to encouraging spectrum-efficiencies in WM operation looking forward. To do otherwise will continue to substantially disrupt the beneficial audio and video broadcast, cable and satellite program production and services to the public as they are

³ See, *Amendment of Parts 15, 73 and 74 of the Commission's Rules to Provide for the Preservation of One Vacant Channel in the UHF Television Band for Use by White Space Devices and Wireless Microphones, and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, MB Docket No. 15-146, GN Docket No. 12-268, *Report and Order* (released Dec. 8, 2020) ("*Termination Order*").

now being provided and upon which the listening and viewing public relies heavily.

4. Broadcast engineers are typically involved in making the technical arrangements for, and conducting ENG and video production operations for news, sporting and entertainment events. This proceeding comes on the heels of a series of recent Commission actions in the past ten years which have heretofore, alone and cumulatively, had an exceptionally significant adverse effect on the availability of UHF spectrum for WMs, LPAS, and wireless intercom systems necessary for audio and video program production. Without any practical opportunity thus far to adapt to those changes, the Commission has, as a practical matter, largely “shut the door” on UHF WMs entirely. In the process, it has eliminated all certainty about the ability to conduct broadcast, cablecast or satellite broadcasts of urgent news, sports and entertainment programming going forward, post-pandemic, due to a completely inadequate amount of residual UHF spectrum for these devices, and with insufficient reaccommodation spectrum elsewhere.

5. On January 14, 2010, in Docket 10-24, the Commission adopted a *Report and Order and Further Notice of Proposed Rule Making (Wireless Microphone R&O/FNPRM)* addressing the rules for WMs and LPAS that operate in the TV bands.⁴ In that proceeding, the Commission prohibited the manufacture, import, sale, lease, offer for sale or lease, or shipment of wireless microphones and other low power auxiliary stations intended for use in the 700 MHz Band (TV channels 52-69, 698-806 MHz) in the United States. It was required that all LPAS facilities, including WMs⁵ cease operation in the 700 MHz band no later than June 12, 2010. The Commission acknowledged that WMs are used for important functions, and noted that many

⁴ See *Report and Order and Further Notice of Proposed Rule Making* in WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24, 25 FCC Rcd 643 (2010).

⁵ Low power auxiliary stations are short-path transmit devices. They are, in addition to wireless microphones and wireless intercoms, used for purposes such as cue and control communications, and synchronization of TV camera signals. 47 C.F.R. § 74.801 *et seq.*

WMs were being operated by (non-broadcast) entities and persons ineligible for a Part 74 license. Therefore, along with the migration of full-power TV stations, Class A TV stations, TV translators, TV boosters and Low-power TV stations to available channels below 698 MHz (the “core TV channels” as they were described at the time), LPAS’ and WMs had to migrate downward as well.”⁶ This greatly reduced the number of channels available for WM and LPAS operation. A very large number of WMs were operating in the 700 MHz band, and that equipment had to be modified or replaced with equipment that would not be capable of operation above 698 MHz. There was a significant deployment of broadcast-configured WMs used by theaters, churches, entertainment venues and even for hotel audio/visual operations.

6. Meanwhile, at the low end of the UHF TV band, TV channels 14-20 (470-512 MHz, known as the “T-Band”) are used in twelve large, major television markets in the United States for important land mobile radio communications. The T-Band is extensively deployed for that purpose in those markets. As discussed more fully below, there have been severe interference cases involving private land mobile communications in the T-Band markets resulting from the TV “Repack” in the past few years of television stations displaced from 614-698 MHz due to the UHF auction being relocated below 608 MHz. The Repack has resulted in more TV broadcast station assignments on television channels just below the T-Band, and in markets adjacent to T-Band Markets on Television Channels 14, 15 and 16. There is a plethora of additional uses made of the television broadcast band. As noted in the *Second Memorandum Opinion and Order* in the 2012 White Spaces Docket ⁷ at ¶ 8:

⁶ TV channels 2-51, excluding channel 37.

⁷ *Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, *Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, ET Docket No. 02-380, Second Memorandum Opinion and Order, 25 FCC Rcd 18661 (2010) (the White Spaces Docket). See also *Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, Third Memorandum Opinion and Order, 27 FCC Rcd 3692 (2012).

In addition, medical telemetry equipment is permitted to operate on an unlicensed basis on any vacant TV channel in the range of channels 7-46, and unlicensed remote control devices are allowed to operate on any TV channel above 70 MHz (*i.e.*, above channel 4), except for channel 37. TV channel 37 (608-614 MHz) is allocated for radio astronomy and the wireless medical telemetry service (WMTS), and is not used for TV broadcasting. The Offshore Radiotelephone Service uses channels 15-17 in certain regions along the Gulf of Mexico...
(footnotes omitted)

The compression of all of those uses into the then-residual television band 512-698 MHz, plus the Commission's addition of TV White Spaces Devices (TVBDs) to the mix and the accommodation (essentially legalization) of unlicensed WM users in that same spectrum made successful frequency coordination of WMs and LPAS' exceptionally difficult, despite real-time channel sharing procedures developed and utilized by SBE frequency coordinators in order to maximize spectrum efficiency.

7. Yet, the Commission did, as recently as September of 2010, provide at least *some* protection for WMs and LPAS. In the *Second Memorandum Opinion and Order* in the White Spaces Docket, at ¶ 29, the Commission stated that it “continue[s] to recognize that wireless microphones are currently used in many different venues where people gather for events large and small and many consumers and businesses have come to rely on these devices.” Specifically for the purpose of accommodating WMs after the reallocation of the 700 MHz band, the Commission noted that it had previously limited use of TV channels 2 and 5-20 to communications between fixed TVBDs, and it had also previously reserved two channels in the range 14-51 in the 13 markets where PLMRS and CMRS systems operate “to make sure that frequencies are available for wireless microphones.”⁸ Most importantly, the Commission held in September of 2010 that it was “...*expanding the reservation of two channels in the range 14-51*

⁸ See *Second Report and Order*, 23 FCC Rcd 16860 (2009) at ¶ 151. With regard to channels 2 and 5-20, the Commission stated that restricting use of channels 2 and 5-20 to communications by fixed devices with other fixed devices would limit the number of TVBDs that could potentially conflict with wireless microphone use.

*to all markets nationwide as suggested by several petitioners. This will provide frequencies where a limited but substantial number of wireless microphones can be operated on any basis without the potential for interference from TV bands devices. It will also ensure that frequencies are available everywhere for licensed wireless microphones used on a roving basis to operate without risk of receiving harmful interference from TVBDs.”*² The Commission also provided for a nominal separation distance between TVBDs and sites of venues and events where large numbers of unlicensed wireless microphones are used by permitting such sites to be registered in the TV bands databases. It noted that, at any particular location, a number of TV channels would not be available for TVBDs due to the application of the various interference protection requirements under the rules. Therefore, the Commission concluded, “a significant amount of spectrum will be available on which wireless microphones can be operated as they have in the past without concern for interference from TVBDs. We believe that this spectrum will provide sufficient frequencies to support wireless microphone operations at the great majority of events.” Because of these accommodations, and specifically because of the reservation of the two channels per market for WM and LPAS operation,¹⁰ broadcasters and video production companies were confident that they could continue to conduct ENG and event production activities as necessary (albeit with increased reliance on local SBE frequency coordination and the cooperative, intra-service real-time channel sharing arrangements fostered by SBE’s coordinators). Broadcasters after late 2010 invested heavily in wireless microphones that would operate near TV channel 37 because of the location of the reserved channels specified by the Commission.

² *Second Memorandum Opinion and Order*, 25 FCC Rcd 18661 at 18674 (2010).

¹⁰ *See*, 47 C.F.R. §15.707(a) (prohibiting white space devices on the first channel above and the first channel below channel 37 that are available, or if a channel is not available above and below channel 37, prohibiting white space devices on the first two channels nearest to channel 37).

8. The Commission's accommodation for UHF WMs in 2010 was certainly no panacea. As the Commission acknowledged in 2012,¹¹ *there is at any given news or entertainment event the need for more than 100 WMs and LPAS devices.*¹² There was then not enough UHF spectrum to accommodate them. With respect to ENG, from the perspective of television broadcasters, the ability to cover breaking news events in real time necessitates *reliably available* WM spectrum. In 2012, in the Incentive Auctions proceeding, SBE noted that "it is critical for broadcasters that there be at least two reserved channels, totaling at least 12 MHz, exclusively for WM operation." The justification for that position was that, at a breaking news event, multiple broadcast entities converge on the same geographic area. Some are local, some are not. Each entity requires (at the

¹¹ A good primer on WM and LPAS use of UHF television broadcast bands was provided by the Commission in 2012. See *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, GN Docket No. 12-268 (rel. Oct. 2, 2012) ("*Incentive Auctions NPRM*") at paragraph 223. There, the Commission stated that:

Licensed LPAS may operate on vacant channels allocated to television broadcasting. In the UHF band, co-channel LPAS operations must be separated by a distance of at least 113 kilometers (70 miles) from the television station. Unlicensed wireless microphones are permitted similar types of operations on this unused spectrum. Wireless microphones operate in a relatively narrow bandwidth and often are technically capable of choosing different frequencies among multiple vacant channels available for operation. Many wireless microphones are used regularly and predictably (*e.g.*, at television studios, movie studio lots, or major sporting events facilities), but at times the location of their operation changes (*e.g.*, covering news events in different places). The nature of wireless microphones and their use is such that they operate for relatively short intervals at different times, and the specific frequencies they use for operation often change, even when used at one location. Theatrical and sports productions and other major events often use more than 100 wireless microphones, which in certain locations could use most if not all of the UHF channels available to them in the television bands.

¹² At the largest sporting events and at political conventions, there are typically more than 120 WMs and LPAS devices in use, often simultaneously. For example, at a recent, pre-pandemic Formula One automobile race in Texas, held at a track well away from the metropolitan area of Austin, Texas, there was an acute shortage of WM spectrum, and well over 120 WMs were in use at any given time, due to the presence of non-U.S. broadcasters as well as local broadcast and video production entities. At the NFL Super Bowl® each year, and during political conventions, extraordinary efforts are made to accommodate the number of WMs necessary to provide coverage of these events that the public expects, using a series of television broadcast channels. Event frequency coordinators are required at these events to make sure that the most efficient use is made of the limited amount of spectrum available now for WMs in real time, and channel sharing by frequency is necessary but not sufficient. Both the NFL and large event sponsors are forced to obtain Special Temporary Authority to use UHF land mobile spectrum for WM and LPAS operations. Given the current amount of WM spectrum, the ability does not exist to bring these events to the viewing public as they are now and as those people have come to expect, despite the use by SBE coordinators of spectrum efficient sharing techniques and despite the best efforts at accommodation provided by the Commission's very professional Experimental Licensing Division of the Office of Engineering and Technology.

very least) two WM channels (one for the WM and one for the IFB). One broadcast entity may have several reporters on site, necessitating several channels. The opportunity to cover these events depends on available spectrum for this purpose.

9. In the *Incentive Auctions* Docket, the Commission recognized that the proposal to auction and repack the UHF TV band below 698 MHz would reduce the spectrum available in the TV bands for secondary use by licensed and unlicensed WMs and LPAS systems, and as well reduce the spectrum available for unlicensed TV white spaces devices.¹³ However, the steps that were taken in the White Spaces docket, specifically the reservation of the two channels per market for WM and LPAS operation where white spaces devices were not permitted near channel 37,¹⁴ were viewed as sufficient to accommodate ongoing video and audio production using WMs at the time.

10. All of that changed with the advent of the 600 MHz auction. In a series of proceedings,¹⁵ the Commission precluded operation of WMs in the band 614-698 MHz (other than in the guard bands and the duplex gap); abandoned the two-reserved-channel per market

¹³ *Incentive Auctions NPRM*, at ¶¶ 221-239.

¹⁴ See, 47 C.F.R. §15.707(a) (prohibiting white space devices on the first channel above and the first channel below channel 37 that are available, or if a channel is not available above and below channel 37, prohibiting white space devices on the first two channels nearest to channel 37).

¹⁵ See, *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition, Amendment of Parts 15, 74 and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, Including Wireless Microphones*, WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24, Report and Order and Further Notice of Proposed Rulemaking, 25 FCC Rcd 643, 644-45, 682-87, paras. 2, 81-90 (2010) (*TV Bands Wireless Microphones R&O and Further NPRM*); *Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, and Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, ET Docket No. 14-165 and GN Docket No. 12-268, Report and Order, 30 FCC Rcd 9551 (2015) (*TV Bands Part 15 R&O*); and *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band, Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition, Amendment of Parts 15, 74, and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations*, WT Docket Nos. 08-166 and 08-167 and ET Docket No. 10-24, Second Report and Order, 29 FCC Rcd 6103 (2014) (*TV Bands Wireless Microphones Second R&O*).

plan adopted earlier; declined to allocate additional spectrum for displaced WMs, claiming that WM operation theretofore had been “inefficient”; proposed instead to reserve one UHF TV channel for WM operation per market, and permitted WM operation in other bands. In the *Wireless Microphones Report and Order*, the Commission allowed what it termed “increased access” to VHF channels between 169-172 MHz; expanded LPAS eligibility for licensed use of the 600 MHz duplex gap and the 944–952 MHz band; and it allowed WM operation in the 941-944 MHz and 952–960 MHz bands (making the band 941-960 MHz available on a contiguous basis for WM operation), in the 1435-1525 MHz band, and in the 6875-7125 MHz band under certain conditions. None of these UHF band alternatives, alone or in the aggregate, is in any sense a sufficient alternative to the loss of access to almost all of the 614-806 MHz band over a relatively short period of time, during which demand for WMs has increased substantially.

11. First of all, the VHF spectrum at 169-172 MHz is not at all equivalent to the UHF band for WM operation because of antenna inefficiency. It does not permit the robust propagation characteristics of the UHF band for WMs because of this factor alone. The restrictions applicable to the guard band and duplex gap segments at UHF, which include a 20 mW EIRP power limit, *radically* reduce the utility, range and reliability of WMs operating in those small, residual segments, when the normal broadcast power level of WMs is 250 mW. The guard band and the duplex gap are subject to high ambient noise levels from out of band emissions of the primary users of the 600 MHz band post-auction, and therefore those segments are of very limited utility, at best. The band 941-960 MHz has a number of incumbent users, not the least of which is aural studio-to-transmitter links and other fixed microwave uses which severely limit the use of the band. While the STLs and TSLs are not likely to be adversely affected by the presence of WMs in the band due to robust link margins of STL and TSL

facilities, the reverse is not true at all, and regular WM operation for ENG in that band is not reliable. Other conflicting uses are Operational Fixed Microwave, and public and private land mobile operation. The same problem of conflicting, preclusive incumbent users exists in the band 1435-1525 MHz, which is allocated on a primary basis to Aeronautical Mobile Telemetry (AMT) which necessitates that all WM operation in that band is subject to prior coordination with AFTRCC. AFTRCC, despite its high level of efficiency in coordinating special operations such as wide bandwidth video production in the band, cannot accommodate broadcasters on a predictive basis, and so only extremely short term coordination is available, and coordination can take days or even weeks. Furthermore, that band is only available to high-capacity WM users. The use of that band for ENG wireless mic operation is thus not feasible, due to the need for immediate, unplanned access to the band for WM operation. In any case, the entire band is most often used necessarily at a sports or event venue for planned, short-term production using video-bandwidth channels via grants of Special Temporary Authority, coordinated through AFTRCC, due to shortages in video channels at the same events in the 2, 2.5, 6.5 and 7 GHz ENG bands. Finally, in the band 6875-7125 MHz, there are licensed, fixed and mobile ENG operations and fixed wireless backhaul operations, making use of the band difficult at best.¹⁶ The band was made available for WMs in the United States due to the manufacture of some WM equipment in Europe which has not been imported here to date, but the utility of the band in the United States for WM operation is severely limited and not reliable. The assumption, therefore, that the VHF TV band, the 900 MHz band, the 1.4 GHz band and the 7 GHz band offer, individually or together, real reaccommodation spectrum for that taken at UHF from broadcasters and video and

¹⁶ While mobile BAS operation in the 7 GHz band cannot be licensed any longer, there are numerous outstanding 7 GHz BAS licenses authorizing mobile operation, which are in use daily in large markets for broadcast ENG due to heavy loading in the 2 GHz (2025-2110 MHz) BAS band, and the exceptionally high noise levels in the 2.5 GHz (2450-2483.5 GHz) BAS band.

audio program producers for WM and LPAS operation is absolutely illusory.

12. As alluded to hereinabove, the displacement of WMs from the bands above 608 MHz, coupled with the results of the TV band repack following the 600 MHz auction, has all but precluded UHF WM operation in the remainder of the UHF television band, between 470 and 608 megahertz, and especially in the T-Band, between 470 and 512 MHz (TV Channels 14 through 20). Auction 1000 was conducted pursuant to Title VI of the Middle Class Tax Relief and Job Creation Act of 2012 (Spectrum Act).¹⁷ The incentive auction was composed of a reverse auction (Auction 1001) in which broadcasters offered to voluntarily relinquish some or all of their spectrum usage rights in the band above 614 MHz, and a forward auction (Auction 1002) of new, flexible-use licenses suitable for providing mobile broadband services. This necessitated the “repacking” or reorganizing of television stations in the residual broadcast television band so that the stations that remained on the air after the incentive auction would occupy a smaller portion of the UHF band, thereby freeing up a portion of that band for new wireless broadband uses. The repacking was authorized by a specific grant of authority in the Spectrum Act.¹⁸ The Spectrum Act required “all reasonable efforts to preserve [as of the date of the enactment of the Act] the coverage area and population served of each broadcast television licensee, as determined using the methodology described in OET Bulletin 69.”¹⁹ The selection of winning reverse auction bids depended in large part on the Commission’s ability to assign television channels to the stations that were not relinquishing their spectrum usage rights. The Commission collected a large amount of data to determine how to repack both reverse auction participants and non-participants. Among this data were “domain files” which included a list of

¹⁷ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6402 (codified at 47 U.S.C. § 309(j)(8)(G)), 6403 (codified at 47 U.S.C. § 1452), 126 Stat. 156 (2012) (the Spectrum Act).

¹⁸ *Id.*, Section § 6403(b)(1).

¹⁹ *Id.*, §§ 6403(b)(1)(B), (b)(2).

all the channels to which a station could be assigned considering “fixed constraints”: incumbents in the bands *other than domestic television stations* that were entitled to interference protection at fixed geographic locations and on specific channels. These incumbents included Canadian and Mexican television facilities or allotments, land mobile and radio astronomy facilities as well as wireless medical telemetry devices. The “constraint files,” were used to check the feasibility of assigning permissible channels to stations that were to remain on the air.

13. In addition to the data required to carry out the statutory preservation mandate of the Spectrum Act [§ 6403(b)(2)], constraint files included data in order to meet the requirements of §§ 90.303 and 73.623(e) of the Commission’s rules. 47 C.F.R. §§ 90.303 requires distance-based protections between television stations and land mobile operations in channels 14-20 in certain markets. 47 C.F.R. §73.623(e) protects land mobile licensees operating at variance with specified locations and channels under waivers of § 90.303. Unfortunately, despite the Commission’s best efforts, co-channel land mobile radio interference has occurred in a large number of repack situations, and the process used in the repack failed to prevent it *ex ante*. The expectation of displaced broadcasters was that the preservation of coverage area and population served subsumed within that obligation was to provide a replacement channel during the repack that did not suffer increased incidents of interference. The actual results of the repack indicate that there are numerous conflicts ²⁰ between repacked TV broadcasters and land mobile facilities. SBE is

²⁰ The Land Mobile Communications Council reports, anecdotally, that in many of the 12 T-Band markets in which TV Channels 14-20 are used for land mobile radio, interference is severe in the band 470-512 MHz. For example, in the Dallas market alone, severe, ongoing interference from co-channel or adjacent channel repacked TV stations located in Texas and Louisiana has been noted to WQXM642, WIJ389, WPKM616, WQBY576, WPLR982, WIM566, KNS428, WPMC359, WNAS361, WPLR672, WPJR757, WIL556, WPKV404, WPKM623, WPKV412, WPKW417, WPKW426, WPLQ505, KX8389, WPJP712, WPKM290, WPMW912, WPLQ520, WPOV621, WPMW908, WPQD624, WPKK217, WPKM635, WPQE404, WIM446, WIM303, WIM329, WIM446, WQBY580, WRFY813, WPKC839, WQBY580, WQZV347, WQBG879, WQBY576, WRFX998, WPKY902, WPXP470, WPYC727, WRHV227, WQVX225, WIM304, WIM574, WNXQ371, WPKK703, WPSS977, WPTU767, WQCA906, WQMM550, WQTN553, WNSW656, WQDI610, WQUN782, WPKC848, WPMK989, WPPA916,

working with the Land Mobile Communications Council (LMCC) to address these interference cases cooperatively, but the interference is preclusive in some markets, occurring regularly, each week. It is quite apparent that there is, in many T-Band markets, *no room for WMs or LPAS facilities*. Furthermore, given the repack, there are relatively few UHF TV channels between 21 and 36 (512-608 MHz) that are available for WM operation.

14. As a practical matter, the Commission cannot assert that it has adequately reaccommodated Part 74-licensed wireless mic users for any purpose whatsoever, given the two major disruptions of WM operation at 700 and 600 megahertz respectively in a period of ten years. Broadcasters have had to invest in reconfigured WMs twice, and they did so based on the strength of the Commission's inconsistent and unstable plans for reaccommodation. While there is likely an impracticality in the dedication of a specific TV channel in each market for WM operation, and while the maximum reaccommodation of television stations displaced from the 600 MHz band due to the UHF TV band auction is both statutorily mandated and clearly in the public interest, it is unclear, post-pandemic, how large scale sporting events, automobile races, regular, daily newscasts, political conventions and other entertainment programming and audio coverage of newsworthy events by broadcast, satellite, cable and broadband providers can continue as the public has come to expect. That shortage, which is current and acute, cannot be made up for by the use of WMAS in any market.

15. SBE is grateful for the opportunity to share these concerns with the Commission in the context of the resolution of this proceeding. We are hopeful that the Commission will recognize that the authorization of WMAS must be done carefully so as to not further disrupt incumbent narrowband WM operation, especially at UHF, and that the Commission should

WPVA505, WPVB757, WPXU766, WPYC714, WQBC525, WQBY627, WQBY653, WQUN585, WIM320, WQTN553, WIM556.

establish as a high priority to make further accommodation for continued UHF wireless microphone and LPAS operation, thus to permit broadcast engineers and video and audio program producers to continue to provide the service to the viewing and listening public that is expected by those viewers and listeners. Moreover, the Commission should require that all users of WMAS technology participate in the frequency coordination process established as a service to the industry by SBE prior to commencement of operation at any given location.

Respectfully submitted,

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July 28, 2021