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

In the Matter of	)	
	)	
Digital Television Distributed Transmission System Technologies	)	MB Docket No. 05-312
	)	
	)	

REPORT AND ORDER

Adopted: November 3, 2008 **Released: November 7, 2008**

By the Commission: Commissioners Copps, Adelstein, Tate, and McDowell issuing separate statements.

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I. INTRODUCTION

1. In this Report and Order, we adopt rules for the use of distributed transmission system ("DTS") technologies in the digital television ("DTV") service. We find that DTS will provide broadcasters with an important tool for providing optimum signal coverage for their viewers. For some broadcasters that are changing channels or transmitting locations for their digital service, DTS may offer the best option for continuing to provide over-the-air service to current analog viewers, as well as for reaching viewers that have historically been unable to receive a good signal due to terrain or other interference. In the *Second DTV Periodic Report and Order*, the Commission approved in principle the use of DTS technologies, but deferred to a separate proceeding the development of rules for DTS operation and the examination of several policy issues related to its use.[1] In the Notice of Proposed Rulemaking in this docket, we examined the issues related to the use of DTS and proposed rules for future DTS operation.[2] The rules we adopt will apply to DTS proposals related to operations after the transition to DTV on February 17, 2009.[3] DTS proposals related to pre-transition operations will continue to be evaluated under the interim policy approved in the *Second DTV Periodic Report and Order* and clarified in the *DTS Clarification Order*.[4]

2. We find that these rules will improve some DTV stations' ability to serve more of their viewers within their service areas. We expect that DTS will be especially useful in mountainous areas where single transmitters have been unable to reach viewers in valleys or those blocked by elevated terrain. Furthermore, DTS may be a useful tool for stations to prevent some loss of service to existing analog viewers resulting from changes to the station's service area in the transition to digital service.

II. EXECUTIVE SUMMARY

3. In summary, we take the following actions to authorize and implement DTS service:

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[1] *See Second Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television,* MB Docket No. 03-15, Report and Order, 19 FCC Rcd 18279, 18356, ¶¶ 177 (2004) ("*Second DTV Periodic Report and Order*"). *Second DTV Periodic Report and Order*, 19 FCC Rcd at 18290, ¶ 28.

[2] *See Digital Television Distributed Transmission System Technologies*, MB Docket No. 05-312, Clarification Order and Notice of Proposed Rulemaking, 20 FCC Rcd 17797 (2005) ("*DTS Clarification Order and DTS Notice*").

[3] *See* Digital Television and Public Safety Act of 2005 ("DTV Act"), which is Title III of the Deficit Reduction Act of 2005, Pub. L. No. 109-171, 120 Stat. 4 (2006) ("DRA") (*codified at* 47 U.S.C. §§ 309(j)(14) and 337(e)).

[4] *See Second DTV Periodic Report and Order*, 19 FCC Rcd at 18283, 18355-57, ¶¶ 9, 174-78 (allowing interim DTS operations if such operations provided predicted service only within a station's currently authorized area and requiring DTS stations to serve essentially all of its replication coverage area); and *DTS Clarification Order*, 20 FCC Rcd at 17798-99, ¶¶ 4-6 (clarifying application of the interim policy).

- We define a DTS service area as being comparable to that of a station's single transmitter facility, and, to implement this approach, we will determine a station's potential maximum authorized service area using the "Table of Distances" proposed in our *DTS Notice.*[5]
- We adopt a waiver policy to permit a station to use DTS if doing so will enable it to continue to serve its existing analog viewers who would otherwise lose service as a result of its transition to digital service.[6]
- We require that DTS transmitters be located within either the DTV station's Table of Distances area or its authorized service area.[7]
- We adopt rules to prohibit stations from using DTS to "cherry-pick" service.[8]
- We afford primary regulatory status to the multiple transmitters used in a DTS network within the areas that such DTS transmitters are authorized to serve.[9]
- We apply to DTS stations the Part 73 licensing and technical rules that apply to DTV single-transmitter stations.[10]
- We will evaluate DTS proposals using the same interference standard adopted for DTV stations' post-transition operations in the *Third DTV Periodic Report and Order.*[11] We also adopt the root-sum-square ("RSS") method of calculating interference from multiple DTS transmitters.
- We permit a licensee of multiple digital Class A TV, digital LPTV, and/or digital TV translator stations to operate through interconnected single-frequency DTS networks, but will continue to separately license each station in this interconnected single-channel network.[12]
- We approve on an experimental basis the use of DTS technologies by a single digital Class A TV, digital LPTV or digital TV translator station to provide service within its authorized service area.[13]

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[5] *See* Section IV.C., *infra.*

[6] *See* Section IV.C., *infra.*

[7] *See* Section IV.C., *infra.*

[8] *See* Section IV.C.3., *infra.*

[9] *See* Section IV.B., *infra.*

[10] *See* Section IV.D.2., *infra.*

[11] *See* Section IV.D.3., *infra.*

[12] *See* Section IV.E., *infra.*

[13] *See* Section IV.E., *infra.*

III. BACKGROUND

A. DTS Technologies

4. A DTV "distributed transmission system" ("DTS") employs multiple synchronized transmitters spread around a station's service area, rather than the current single-transmitter approach. Each transmitter broadcasts the station's DTV signal on the same channel. Due to the synchronization of the transmitted signals, DTV receivers treat the multiple signals as reflections or "ghosts" and use "adaptive equalizer" circuitry to cancel or combine them to produce a single signal. (DTS has also been referred to as DTT, for distributed transmission technologies and as DTx, for distributed transmitters.)

5. Full-power analog TV and DTV stations provide service within an area that reaches up to 80 miles from their single transmitting site. Coverage distance depends on a station's authorized channel, power, antenna height and the characteristics of the surrounding terrain. Some stations have authorized facilities that only provide service to a distance of 30 to 40 miles. In situations where coverage is limited by terrain, such full-power stations sometimes use translators that re-broadcast the station's signals on a different channel at relatively low power to provide service in a small area. Translator stations are authorized with secondary regulatory status. In addition, in a few cases, full-power analog TV stations have been able to use TV booster stations, which are like TV translator stations but use the same channel as the primary station. DTV distributed transmitters are similar to analog TV booster stations in some ways, but DTV technologies have the potential to enable much broader use of this type of operation.

6. Potentially, DTS can provide service to areas that a single-transmitter station would fail to reach due to natural or man-made obstructions that would block the signal coming from the single-transmitter site. It can provide more uniform signal levels throughout a station's service area, making indoor reception more reliable. Also, multiple DTS transmitters generally operate at a lower power than a single transmitter to achieve the same coverage and thereby reduce the likelihood of causing interference to neighboring licensees. Use of DTS is also more spectrum efficient than use of translators because DTS uses the stations' already allotted frequency, whereas translators require one or more additional frequencies. In addition, establishing new DTV translators generally requires separate applications for each translator to be filed during an open filing opportunity with a possible lengthy review process to determine and resolve mutually exclusive applications, while applications for DTS can be submitted by the station seeking to use the additional transmitters and evaluated as part of one application.

7. In the *Second DTV Periodic Report and Order*, the Commission adopted an interim DTS operations policy ("interim policy"). The interim policy permits stations to use DTS within their currently authorized area (including its replication area as well as any maximization area resulting from facilities granted by a construction permit or license). For an interim DTS proposal to be approved, it must be designed to serve essentially all of the station's replication coverage area.[14] In the *DTS Clarification Order*, the Commission clarified how the interim policy applies during the pendency of this proceeding.[15] Specifically, consistent with the requirement that stations using DTS must serve at least the

[14] *Second DTV Periodic Report and Order*, 19 FCC Rcd at 18356-57, ¶¶ 177-78.

[15] *DTS Clarification Order*, 20 FCC Rcd at 17799, ¶ 4.

population that is currently served with a single transmitter, DTS transmitters must be located within the DTV station's predicted noise-limited service contour (PNLC).[16] The *DTS Clarification Order* also said that the Commission would consider on a case-by-case basis requests from stations to extend beyond the PNLC by a minimal distance, provided such extension is necessary to permit coverage of the area within the PNLC.[17] At present, only one station has applied for and been authorized to operate a DTS system under the interim policy.[18] In addition, the Commission has approved the use of a multiple DTV transmitter system using multiple channels under an experimental authorization.[19] We also note that TV station WSTE, channel 7, Ponce, PR, which currently operates an integrated system of synchronous boosters to broadcast its analog signal throughout its coverage area, will be allowed to convert its current system to a digital network when it files its application for post-transition operations.[20]

B. The DTV Transition

8. In early 2006, after the release of the Commission's *DTS Clarification Order and DTS Notice*, Congress enacted significant statutory changes relating to the DTV transition. Most importantly, the DTV Act established February 17, 2009 as the hard deadline for the end of the

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[16] *Id.*

[17] *Id.*

[18] Reading Broadcasting, Inc. ("RBI"), licensee of WTVE-DT, channel 25, Reading, PA was granted a DTS STA on Nov. 30, 2006; *see* FCC File No. BSDTS-20060407ACP.

[19] On May 23, 2007, the Video Division of the Commission's Media Bureau issued a letter granting the Metropolitan Television Alliance ("MTVA") experimental authority to operate a low-power DTV multiple-transmitter system in New York, NY. The MTA consists of the licensees of ten New York City area television stations (WCBS-TV, WNBC-TV, WNYW-TV, WABC-TV, WWOR-TV, WPIX-TV, WNET-TV, WPXN-TV, WNJU-TV, and WXTV(TV)). These stations operated digital facilities from the North Tower of the World Trade Center, which was destroyed in the September 11th attack. The experimental DTV network is testing the ability of these stations to provide fill-in over-the-air DTV coverage in areas of New York City where adequate coverage is not provided. *See* Letter from Barbara A. Kreisman, Chief, Video Division, Media Bureau (1800E1-KRH) to Metro Television Alliance, LLC, c/o Thomas P. Van Wazer (dated May 23, 2007). In an ex parte in September 2008, presented the results of its field test study. *See* MTVA *ex parte* (dated Sept. 11, 2008). In addition, two stations applied for and were authorized to operate a DTS system under an experimental authorization; however, such authority has now expired for these stations. The Pennsylvania State University, NCE licensee of WPSU-DT, channel 15, Clearfield, PA, which was the first to build an experimental DTS system, applied for this system before the interim DTS policy was established, but has since allowed authority for this system to expire. *See* FCC File Nos. BPEXT-20010608ABD, BEPEXT-20020618ABG and BEPEXT-20030805ARU. Tribune Broadcast Holdings, Inc., licensee of WTTK-DT, channel 54, Kokomo, IN, applied for an experimental DTS system because they could not meet the interim policy restrictions. The station, however, has now ceased operating its experimental DTS system and has withdrawn its experimental authority in order to focus on the construction of the station's post-transition facility. *See* FCC File Nos. FCC File Nos. BPEXT-20050427AEV and BEPEXDT-20060519ACV.

[20] Siete Grande, licensee of WSTE, seeks to fully replicate the coverage of its analog booster system when it transitions to DTV. *See* Siete Grande comments at 16-17. *See also* Comments of Siete Grande in MB Docket No. 87-268 (filed Jan. 25, 2007). In the *Seventh Report and Order* in the DTV proceeding, the Commission revised WSTE's parameters in the post-transition DTV Table Appendix B to enable the station to replicate its analog coverage. The Commission also instructed the Media Bureau to process, and grant as appropriate, the applications that will permit WSTE to continue serving its coverage area with its digital signal. *Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, MB Docket No. 87-268, Seventh Report and Order and Eighth Further Notice of Proposed Rulemaking, 22 FCC Rcd 15581, 15609, n.168 (2007) ("*Seventh Report and Order*" and "*Eighth Further Notice*").

DTV transition and the end of analog transmissions by full power stations.[21] The DTV Act also requires full-power television broadcast licensees to cease operations outside the core DTV spectrum (*i.e.*, channels 2-51) after February 17, 2009 in order to make that spectrum available for new public safety and commercial wireless services.[22] Full-power TV broadcast stations must be operating inside the core TV spectrum and only in digital at the end of the transition.[23]

9. On August 6, 2007, the Commission released the post-transition DTV Table of Allotments ("DTV Table"), providing eligible stations with channels for DTV operations after the DTV transition on February 17, 2009.[24] On December 22, 2007, the Commission adopted a Report and Order in the Third DTV Periodic Review proceeding.[25] In the *Third DTV Periodic Report and Order*, we established a number of procedures and rule changes designed to provide flexibility to broadcasters to ensure that they meet the statutory transition deadline and complete construction of their final, post-transition (DTV) facilities. Among other things, we set construction deadlines for full-power television stations to construct their full, authorized post-transition (DTV Table Appendix B) facilities[26] and established the procedures and standards applicants must follow in filing applications for facilities specified in the final, post-transition DTV Table.[27] On May 30, 2008, the Commission lifted the freeze on the filing of maximization applications, as well as on the filing of petitions for rulemaking to allow requests for channel substitutions to the DTV Table.[28]

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[21] *See supra* note 3.

[22] *See* 47 U.S.C. § 337(e)(1).

[23] *Id.* We note that the statutory transition deadline applies only to full-power stations. *See* 47 U.S.C. §§ 309(j)(14) and 337(e). The Commission previously determined that it has discretion under 47 U.S.C. § 336(f)(4) to set the date by which analog operations of stations in the low power and translator service must cease. *Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, MB Docket No. 03-185, Report and Order, 19 FCC Rcd 19331, 19336 ¶ 12 (2004) ("*Digital LPTV Report and Order*"). The Commission opted not to establish a fixed termination date for the low power digital television transition until it resolved the issues concerning the transition of full-power television stations. *Id.* at 19336 ¶ 19.

[24] *See generally Seventh Report and Order*, *supra* note 20; *on recon.*, Memorandum Opinion and Order on Reconsideration of the Seventh Report and Order and Eighth Report and Order, 23 FCC Rcd 4220 (2008) ("*First Order on Reconsideration*"). The post-transition DTV Table is the result of informed decisions made by eligible licensees and permittees during the Commission's channel election process. The channel election process was established by the Commission in the 2004 *Second DTV Periodic Report and Order*.

[25] *See Third Periodic Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MB Docket No. 07-91, Report and Order, 23 FCC Rcd 2994 (2007) ("*Third DTV Periodic Report and Order*").

[26] *See id.* at 3014-26 (Section V.B.).

[27] *See id.* at 3059-63 (Section V.D.).

[28] *See* Public Notice, "Commission Lifts the Freeze on the Filing of Maximization Applications and Petitions for Digital Channel Substitutions, Effective Immediately," DA 08-1213 (MB rel. May 30, 2008).

IV. DISCUSSION

10. In this Report and Order, we adopt rules for television broadcasting using a DTS network.[29] Specifically, we will permit DTV station licensees and permittees to use DTS technologies where feasible in place of a single transmitter to provide service as authorized. These rules will apply to stations' post-transition operations. We apply to DTS stations the Part 73 licensing and technical rules that apply to DTV single-transmitter stations and will evaluate DTS proposals using the same interference standard adopted for DTV stations' post-transition operations in the *Third DTV Periodic Report and Order*.[30] Stations wishing to apply to use DTS must wait until the Commission obtains approval from the Office of Management and Budget ("OMB") for the revised forms and modified information collection requirements. The Media Bureau will announce by public notice when the Commission is ready to accept applications for DTS. Until the changes to the necessary forms are effective,[31] we will continue to accept DTS proposals under our interim policy to be evaluated as a request for Special Temporary Authority ("STA").[32]

11. For example, we recognize that stations may wish to use DTS to ensure that their current analog viewers do not lose service after the station transitions to digital-only operation. A station that wishes to use DTS for this purpose need not wait for the final rules to take effect, but may apply under the interim policy and request a waiver of the limitations to authorized service area, if necessary.[33] Stations that receive an STA to use DTS under the interim policy must still apply to use DTS for their post-transition operations once our new rules and forms become effective.

12. The Commission received 23 comments and 11 reply comments to the *DTS Notice*.[34] The *DTS Notice* sought comment on the use of DTS technologies, as well as on the asserted benefits of such technologies, and proposed to permit DTV station licensees and permittees to use DTS technologies where feasible in place of a single transmitter to provide service as authorized.

A. Use and Benefits of DTS Technologies

13. We adopt our proposal in the *DTS Notice*[35] to authorize DTV stations to use a network of DTS transmitters in lieu of a single-transmitter facility. The record generally supports our proposal to allow DTV stations to use DTS technologies and confirms the spectrum

[29] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626. The rules adopted herein are revised from those proposed in the *DTS Notice* to better effectuate the goals of this proceeding.

[30] *See Third DTV Periodic Report and Order*, 23 FCC Rcd at 3059-73 (Sections V.D-F.).

[31] *See* Appendix C – Form Changes to Forms 301 and 340.

[32] 47 CFR § 73.1635. *See DTS Clarification Order*, 20 FCC Rcd at 17798-99, ¶¶ 4-6. In addition, any DTS proposals related to pre-transition operations may be evaluated under the interim policy.

[33] *See* discussion of waiver policy *infra* ¶ 28.

[34] *See* Appendix A – List of Commenters.

[35] *DTS Notice*, 20 FCC Rcd at 17800, ¶ 7.

use efficiency and improved consumer service likely to result from the use of DTS.[36] We disagree with the claims of New America Foundation and others (collectively "NAF, *et al.*")[37] that areas within a DTV station's authorized service area that are now not reached because of terrain or other reason, constitute unreachable space that should be made available for other uses.[38] Because we decide herein to limit DTS service to the area that the DTV station is, or would be, authorized to serve with a single transmitter, we disagree that DTS would confer new spectrum rights to broadcasters.[39] In addition, our rules for DTS operations address the concerns raised in the docket about potential abuse and cherry-picking.[40] We note that stations using DTS should be aware that some of their viewers may need to adjust their antennas to receive the DTS signal from a direction that is different from the direction of the signal from the main antenna.[41]

14. DTS proponents tout a number of benefits,[42] which mostly include those anticipated by the Commission:[43]

- First, DTS will allow stations to reach viewers that would not otherwise be served by conventional means.[44] This includes reaching rural and remote areas, as well as

[36] *See* Alliance comments at 1; APTS comments at 1; Coalition comments at 1; CDE Reply comments at 1; CBA comments at 1; Cox Reply comments at 1; Harris comments at 5-6; KJLA, et al comments at 1; LIN comments at 1; MWG comments at 1-2; MSTV comments at 1; NAB comments at 1; Paxson comments at 1-2; Rohde & Schwarz, Inc. and Samsung comments at 1; Siete Grande comments at 3; Smith comments at 1-2; SunBelt comments at 1; Penn State comments at 1; TVPlus comments at 1.

[37] The sole opposition to the proposal to allow broadcasters to use DTS technologies comes from a joint filing by several consumer groups, which include: New America Foundation (NAF), Media Access Project (MAP), Acorn Active Media Foundation, Action Coalition for Media Education (ACME), Alliance for Community Media (ACM), Benton Foundation, Center for Digital Democracy (CDD), Center for Neighborhood Technology (CNT), Champaign-Urbana Community Wireless Network (CUWiN), Citizens for Independent Public Broadcasting (CIPB), Common Cause, Consumer Federation of America (CFA), FreeNetworks.org, Free Press, Future of Music Coalition (FMC), Hawaii Consumers, MediaChannel.org, Media Alliance, Prometheus Radio Project, Reclaim the Media, and Tribal Digital Village (TDV) (collectively, "NAF, et al."). *See NAF, et al.* comments filed Feb. 7, 2006.

[38] The Commission recently authorized the operation of new low power devices in the TV broadcast spectrum at locations where individual channels/frequencies are not being used for authorized services. *See Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, First Report and Order and Further Notice of Proposed Rulemaking, 21 FCC Rcd 12266, 12267, ¶ 2 (2006) ("*White Space Order*").

[39] *See* NAF, *et al.* comments at 6, 9, 13.

[40] *See* cherry-picking discussion at section IV.C.3., *infra*.

[41] Moreover, in adjusting their antenna to acquire the DTS signal, such adjustment may cause loss of other broadcast signals, necessitating re-scanning of the channels on the viewer's DTV set or converter box.

[42] *See, e.g.*, Alliance comments at 1; APTS comments at 1; Coalition comments at 1; CDE Reply comments at 1; CBA comments at 1; Cox reply comments at 1; Harris comments at 5-6; KJLA, *et al.* comments at 1; LIN comments at 1; MWG comments at 1-2; MSTV comments at 1; NAB comments at 1; Paxson comments at 1-2; Rohde & Schwarz, Inc. and Samsung comments at 1; Siete Grande comments at 3; Smith comments at 1-2; SunBelt comments at 1; Penn State comments at 1; TVPlus comments at 1.

[43] *DTS Notice*, 20 FCC Rcd at 17801-02, ¶ 12.

[44] *See, e.g.*, APTS comments at 1-2; Coalition comments at 1-3; LIN comments at 1-2; MSTV comments at 1; NAB comments at 1, 5; Paxson comments at 1-3; Paxson Reply at 2. *See also* MWG comments in MB Docket No. 03-15 at 14. We agree with MSTV that "the core purpose of DTS is to enhance the reliability of service to a station's over-the-air viewers." MSTV comments at 10.

filling-in gaps in coverage within a station's authorized service area caused by terrain blockage.

- Second, DTS techniques will distribute more uniform and higher-level signals throughout a DTV station's service area.[45] This will offer improved service within stations' coverage areas, including near the edges where signals can be low using traditional means. We agree that this should increase viewership through improved reception without causing more interference to neighboring operations, as well as minimize the preclusive impact on existing and future surrounding stations.[46]
- Third, DTS will improve reception quality and reliability through operation of transmitters at lower power and height.[47] It will improve reception of DTV signals on pedestrian and mobile devices, and enhance indoor reception, especially for suburban viewers. DTS may also allow manufacturers to create new types of reception devices.[48]
- Fourth, DTS offers an alternative to stations whose single, taller tower proposals may have been stymied by tower height and placement limits associated with aeronautical safety or local zoning concerns, including aesthetic and safety concerns about taller towers.[49] DTS may also minimize delays and expenses to build out because broadcasters can collocate on existing wireless towers.[50]
- Fifth, a DTS network will enhance spectrum efficiency because such a network uses the same channel for all of its operations.[51]
- Sixth, DTS may facilitate the DTV transition by delivering more reliable digital signals to viewers and by offering a less costly alternative to constructing a large single tower facility.[52] DTS can also benefit stations moving their DTV operations to new channels where existing transmission equipment cannot be re-used.[53] DTS operation offers broadcasters another means to achieve their build-out deadlines, thereby advancing the DTV transition. Broadcasters will be able to reach larger portions of their audiences by delivering signals to segments of the public who,

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[45] *See, e.g.*, APTS comments at 1-2; MWG comments at 8; NAB comments at 1, 5; Paxson comments at 2-3; RBI, 2-3; TVPlus comments at 3.

[46] *Id.* We disagree with the NAF, *et al.* who question whether DTS would actually increase viewership. NAF, *et al.* comments at 12-13.

[47] *See, e.g.*, Alliance comments at 1; LIN comments at 1-2; MWG comments at 3; NAB comments at 1, 5; Paxson comments at 2-3; RBI, 2-3; TVPlus comments at 3.

[48] *See, e.g.*, Paxson, 2-3.

[49] *See, e.g.*, LIN comments at 1-2; NAB Reply comments at 3; Paxson comments at 5.

[50] *See, e.g.*, RBI comments at 2-3; TVPlus comments at 3-5; TVPlus Reply at 1.

[51] *See, e.g.*, NAB comments at 2.

[52] *See, e.g.*, Coalition comments at 3.

[53] *See, e.g.*, NAB Reply comments at 3.

absent DTS solutions, might not be able to receive a station's DTV signal over the air.[54]

- Seventh, for the reasons already noted (*e.g.*, improved service), DTS will enhance DTV broadcasters' ability to compete with cable and satellite service and offer an effective over-the-air alternative for many viewers. We disagree that this competitive benefit necessitates or warrants that we permit DTS stations to expand their over-the-air service throughout their entire Designated Market Areas ("DMAs"), as argued for by Paxson and others.[55]
- Finally, we believe DTS may be a useful tool for stations to address the service loss situation that came to light during the Wilmington DTV early transition, where some analog viewers of station WECT, Wilmington, NC (channel 6), who lived beyond the station's digital service area, lost service when the station transitioned to digital-only operations.[56] DTS may provide stations in this situation with the ability to continue to serve some of their analog viewers who would lose service as a result of the stations' transition.[57] We also believe that DTS may allow stations to improve service to viewers that are within a station's digital service contour and previously received a strong analog signal, but are now at the edge of the digital service area and now receive a weaker signal.

B. Regulatory Status

15. We adopt our proposal in the *DTS Notice*[58] to afford primary regulatory status to the multiple transmitters used in a DTS network within the areas that such DTS transmitters are authorized to serve.[59] The record supports the grant of primary status to DTS transmitters located within a station's authorized service area.[60] We adopt our tentative conclusion and find that primary status within a station's authorized service area is essential for stations to implement

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[54] *See, e.g.*, MWG comments at 3.

[55] *See* Paxson comments at 16. Paxson argues that DTS technology, if used to expand coverage throughout a station's DMA, has the "potential to revitalize over-the-air broadcasting" and would enable DTS broadcasters to compete with cable and satellite service.

[56] *See Ex Parte* Comments of MWG (dated Sept. 29, 2008). *See also* Written Statement Of The Honorable Kevin J. Martin, Chairman, Federal Communications Commission, Before the United States Senate Committee on Commerce, Science, and Transportation (dated Sept. 23, 2008) at 7-8; http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-285589A1.doc.

[57] We recognize that DTS will not solve every instance in which analog viewers lose service after the digital transition. For example, in some situations, use of DTS might interfere with another station's service and could not be permitted. Other solutions are available, including increasing the station's power, using translators, changing channels, and using another station's subchannel to provide service via multicasting.

[58] *DTS Notice*, 20 FCC Rcd at 17801, ¶ 11.

[59] *See* discussion of DTS service area *infra* Section IV.C.

[60] *See, e.g.*, Alliance comments at 1-2; APTS comments at 3; Coalition comments at 6; Coalition Reply at 2-4; KJLA et al. comments at 2; MSTV comments at 2; MSTV Reply comments at 1; MWG comments at 8; NAB comments at 3; Paxson comments at 12; RBI comments at 3; Siete Grande comments at 3; Smith comments at 2; Sunbelt comments at 2; TVPlus comments at 5.

a successful DTS network and obtain the benefits offered by DTS techniques.[61] We agree with MWG that, without primary treatment, stations would face protection issues and would be discouraged from using DTS.[62] We conclude that, without primary status, stations would lose primary coverage to significant populations that now enjoy such via a single-transmitter. As described below, we will consider waiver requests, on a case-by-case basis, to permit a station to use DTS to continue serving its existing analog viewers within its analog Grade B contour who would otherwise lose over-the-air service after the station terminates analog broadcasting.[63] Where granted, these areas will also continue to have primary regulatory status, as they currently have for analog service.

C. Service Area and Location of Transmitters

16. As explained in more detail below, we adopt a Comparable Area Approach, meaning that a DTS service area will be comparable to that of the station's single transmitter facility, and define a DTS station's potential (or hypothetical) maximum authorized service area using our proposed "Table of Distances."[64] The question of how best to define a DTS station's authorized service area garnered the most attention in the record, with commenters debating a variety of alternative approaches. Our discussion in this section focuses, first, on whether a DTS station's authorized service area should be comparable to that of the station's single transmitter facility ("Comparable Area Approach"), or if a DTS station should be authorized to significantly expand its service area beyond that now permitted by a single-transmitter broadcaster under the rules ("Expanded Area Approach"). Next, we determine how best to implement the adopted approach. In implementing that approach, we must also address the concerns that a DTS station may use its DTS network to "cherry-pick" (*i.e.*, favor certain populations over others), or otherwise operate in a way that would affect a station's obligation to serve its principal community of license. Finally, we discuss the placement of the multiple DTS transmitters.

1. Comparable Area Approach Adopted

17. We adopt a Comparable Area Approach as proposed in the *DTS Notice*.[65] For this purpose, we will define a DTS station's maximum authorized service area to be comparable to that which the DTV station could be authorized to serve with a single transmitter.[66] A DTS broadcaster will be allowed to apply to provide service to a distance comparable to the hypothetically maximized service distance that could be reached by a single-transmitter station.[67]

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[61] *DTS Notice*, 20 FCC Rcd at 17801-02, ¶ 12.

[62] MWG comments at 8.

[63] *See* discussion of waiver policy *infra* ¶ 28.

[64] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(c).

[65] *DTS Notice*, 20 FCC Rcd at 17804, ¶ 20.

[66] Subject to their being able to meet other requirements regarding service and interference, DTS broadcasters may serve all areas within a station's authorized service area as defined in the new post-transition DTV Table. *See* 47 C.F.R. § 73.622(i). Similarly, a DTS broadcaster may also serve all areas within the station's maximized service area authorized. Stations applying to use DTS must have an authorized service area or establish an authorized service area prior to filing their DTS application. *See infra* at ¶ 41.

[67] The hypothetically maximized service distance refers to stations' facilities equal to the maximum power and antenna height allowed by our rules, which limit how large stations' service areas can be. *See* 47 C.F.R. § 73.622(f). (continued....)

The Commission's rules generally define a DTV station's service area as the station's predicted noise-limited service contour.[68] DTV service areas are calculated using the parameters specified in the DTV Table or authorized by a DTV construction permit or license.[69] Commenters were divided on the DTS service area issue, with some favoring a Comparable Area Approach[70] and others advocating an Expanded Area Approach,[71] such as the DMA Approach, which was tentatively rejected in the *DTS Notice*.[72]

18. We select the Comparable Area Approach over an Expanded Area Approach for several reasons. First, this approach offers consistent treatment to both single-transmitter and DTS stations and best balances the primary coverage rights between stations choosing to employ DTS and those choosing not to do so. An Expanded Area Approach is not necessary to implement DTS service or obtain its core benefits.[73] Second, we find that this approach best protects the principles of localism by restricting a station's focus to its traditional coverage area.[74] Third, we find that a Comparable Area Approach is more consistent with our TV channel allotment and licensing policies applicable to single-transmitter stations.[75] Fourth, we find that this approach, unlike an Expanded Area Approach, would preserve opportunities for new

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It is hypothetical because it assumes approval of such maximized facilities. Stations, however, must still apply for facilities to serve such a maximized coverage area and obtain Commission approval. In addition, stations must obtain FAA or state or local government approval as may be necessary for such facilities. A station applying for DTS facilities would not be required to first apply for Commission approval of their hypothetical single-transmitter maximum facilities because, as discussed *infra* at ¶ 25, we have established a Table of Distances for this purpose.

[68] 47 C.F.R. § 73.622(e) ("The service area of a DTV station is the geographic area within the station's noise-limited F(50,90) contour where its signal strength is predicted to exceed the noise-limited service level.").

[69] *Id.* at § 73.622(i) (post-transition DTV Table). *See also id.* at §§ 73.622(e)(2) and 73.625(b). Stations should also consult OET Bulletin No. 69 for guidance in calculating a station's DTV service area using the Longley-Rice methodology.

[70] Several commenters said that DTS stations should be allowed to apply for facilities to serve an area generally comparable to the area they could cover with a single transmitter. *See, e.g.*, Alliance at 2; CBA at 3; Harris 2; Siete Grande at 14; Smith at 2. In addition, MSTV and Cox agree that stations should not be afforded dramatically expanded primary coverage rights, stating that a DTS service area should be defined to "preclude expanded primary coverage rights except into traditionally underserved rural areas." MSTV comments at 10-11; and Cox reply at 1-2. We further note that the NAF, et al., while generally opposing DTS, particularly oppose any expansion beyond a station's traditional authorized service area in that such use may impact the availability and use of TV white space. NAF et al. comments at 9.

[71] Other commenters advocate for an approach tentatively rejected in the *DTS Notice* at 17803-05, ¶¶ 18-19, but advanced by the Coalition, to permit primary DTS use within a station's entire DMA, subject only to interference and minimum service requirements ("DMA Approach"). *See, e.g.*, Coalition comments at 2, 6-9; CDE comments at 1-2; KJLA et al. comments at 1; NAB comments at 4; Paxson comments at 5; RBI comments at 4; Sunbelt comments at 3-5; Penn State comments at 4; TVPlus comments at 6-7. Alternatively, these commenters seek to afford secondary status to DTS use outside a station's authorized service area but within a station's DMA ("DMA Secondary Service Approach").

[72] *DTS Notice*, 20 FCC Rcd at 17803-04, ¶ 18.

[73] *See supra* ¶ 13-14.

[74] *See, e.g.*, MSTV comments at 11 (warning that "arbitrary service expansion" may "undermine principles of localism"). *See also, e.g.*, Alliance at 2; CBA at 3; Harris 2; Siete Grande at 14; Smith at 2.

[75] *See, e.g.*, 47 C.F.R. § 73.623(h). *See also generally* 47 C.F.R. Parts 73 and 74.

stations, including low-power stations.[76] Finally, while a promising technology, DTS is still new and we hesitate at this time to dramatically redefine the broadcast television service based on that technology. We thus find that DTS stations should not be afforded dramatically expanded primary coverage rights.[77]

19. We also note that stations using single-transmitter or DTS operation can expand their reach through TV translators or low power television ("LPTV") operations, albeit on a secondary basis.[78] In this regard, we disagree with the NAF, et al.[79] that argue that TV operations should be restricted to provide more vacant channels for the operation of unlicensed devices.[80] The TV services for which this spectrum is allocated on primary and secondary bases are important media for the provision of news, information, and entertainment that warrant priority over those unlicensed broadband devices.

20. The primary Expanded Area Approach advanced by commenters is the DMA Approach, advanced by the Coalition, which would allow DTS broadcasters to expand their service to cover an entire DMA, limited only by the requirement that they do not cause unacceptable interference to another licensee.[81] The Commission, however, tentatively rejected this DMA Approach in the *DTS Notice*[82] and we remain troubled by the implications of allowing significantly greater coverage for DTS than the coverage that can be achieved by a traditional single-transmitter station. We find that it is not appropriate at this time to expand significantly the coverage rights of some stations by allowing DTS operation on a primary basis beyond a station's authorized maximized area and bounded only by the DMA to which it is assigned by the Nielsen Media Research (Nielsen).[83] As explained in the *DTS Notice*, many DMAs cover extensive areas and the DMA Approach could allow some stations to provide service into communities 100 or more miles away from their community of license.[84] We agree with MSTV and others that DTS must not be used to undermine localism and that a DTS service area should not shift a station's primary focus from its community of license.[85] We find that DTS

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[76] *See also, e.g.*, Alliance at 1 (saying DTS must not undermine the contributions of boosters, translators and low-power stations).

[77] *DTS Notice*, 20 FCC Rcd at 17802, ¶ 14.

[78] *See infra* ¶¶ 24,34.

[79] NAF et al. comments at 9.

[80] *See White Space Order*, *supra* note 38.

[81] *See, e.g.*, Coalition comments at 2, 6-9; CDE comments at 1-2; KJLA et al. comments at 1; NAB comments at 4; Paxson comments at 5; RBI comments at 4; Sunbelt comments at 3-5; Penn State comments at 4; TVPlus comments at 6-7.

[82] *DTS Notice*, 20 FCC Rcd at 17803-04, ¶ 18.

[83] Nielsen assigns DMAs based on measured viewing patterns and these assignments occasionally change.

[84] *Id.*

[85] MSTV comments at 11. MSTV is concerned about the impact of "service shifts and expansions within a station's own DMA" on local viewers. MSTV would, however, allow expanded service only into "traditionally underserved rural areas in which populations have historically been insufficient to sustain viable, full-service over-the-air station." *Id.*

technology's core purpose should be to improve service to a DTV station's local community, both in increasing reception reliability to existing viewers and reaching local viewers now blocked because of terrain and other like impediments. A Comparable Area Approach achieves that purpose, while the DMA Approach may distract stations from this important policy goal.

21. At the crux of the DMA Approach is the proposition that a DMA is a broadcaster's "natural market."[86] Proponents of the DMA Approach argue that a Comparable Area Approach imposes an artificial limit on the full application and benefits of DTS technologies because DTS broadcasters are no longer constrained by the reach of a single-transmitter.[87] The Coalition and others argue that our concerns about localism are "misplaced" because the Commission's rules now require stations to serve their community of license and stations are now carried via cable and satellite throughout their DMA.[88] They also argue that an Expanded Area Approach would better enable over-the-air DTV service to compete with cable and satellite service.[89]

22. Broadcasters, however, are licensed to local communities, not DMAs, and for good reason. This ensures that broadcasters are responsive to the unique interests and needs of the individual communities to which they are licensed.[90] Section 307(b) of the Communications Act explicitly requires the Commission to "make such distribution of licenses, frequencies, hours of operation, and of power among the several States and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same."[91] Pursuant to this mandate, when the Commission allocates channels for a new broadcast service, its first priority is to provide general service to an area, but its next priority is for facilities to provide the first local service to a community.[92] In carrying out the mandate of Section 307(b), the Commission has long recognized that "every community of appreciable size has a presumptive need for its own transmission service."[93] Indeed, the Supreme Court has stated that "[f]airness to communities [in

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[86] *See, e.g.*, Paxson comments at 7 (stating that the DMA has emerged as "broadcasters' natural market"). Although concerned about the impact on localism, MSTV joins in this general assertion that "the DMA approach is a more accurate reflection of a station's market." MSTV, however, says that the Commission must "ensure that a station generally cannot expand service to areas within its DMA that are nevertheless far outside the station's existing service area." MSTV comments at 10.

[87] *See, e.g.*, Paxson comments at 5-6, 8; RBI comments at 4.

[88] *See, e.g.*, Coalition comments at 10. Paxson also notes that the Commission licenses new wireless services via geographically-based areas. Paxson comments at 7.

[89] *See, e.g.*, Paxson comments at 7; Coalition comments at 2.

[90] The Commission has a long-standing policy to foster broadcast "localism," which it has defined as the airing of "programming that is responsive to the needs and interests of their communities of license." *See, e.g.*, *Broadcast Localism*, MB Docket No. 04-233, Report and Notice of Proposed Rulemaking, FCC 07-218 (rel. Jan. 24, 2008) ("*Broadcast Localism NPRM*"); Notice of Inquiry, 19 FCC Rcd 12425, ¶ 1 (2004) ("*Broadcast Localism NOI*").

[91] *See* 47 U.S.C. § 307(b) ("In considering applications for licenses, and modifications and renewals thereof, when and insofar as there is demand for the same, the Commission shall make such distribution of licenses, frequencies, hours of operation, and of power among the several States and communities as to provide a fair, efficient, and equitable distribution of radio service to each of the same.")

[92] *See Broadcast Localism NOI*, 19 FCC Rcd at 12425, ¶ 2.

[93] *See id.*

distributing radio service] is furthered by a recognition of local needs for a community radio mouthpiece."[94] Moreover, we find that it would be inappropriate to redefine the broadcast television service in this proceeding, which pertains only to DTS. Adopting an expanded service area only for DTS broadcasters would disfavor stations that choose to continue using a single-transmitter.

23. It is certainly true that the Commission has several important rules in place designed to protect localism.[95] We agree with commenters, for example, that our principal community coverage requirement plays an important part in protecting localism.[96] Moreover, as noted by the Coalition, a broadcaster's service to its local community will be evaluated when seeking renewal of its license.[97] These rules, which will continue to apply to DTS stations as they do single-transmitter stations, work within the existing licensing framework to protect localism and highlight the importance of maintaining a station's focus on its community of license.

24. We adopt our tentative conclusion in the *DTS Notice*[98] that an Expanded Area Approach, particularly throughout a geographically large DMA, would subvert our current licensing rules by allowing a station to obtain the rights to serve a new community where a new station, including a low-power station, might otherwise be licensed.[99] We reject the argument of the Coalition and others that a DMA Approach would not preclude new stations "because DTS

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[94] *See id.*; *Pacific Broadcasting of Missouri LLC*, 18 FCC Rcd 2291 (2003) (quoting *Public Service Broadcasting of West Jordan, Inc.*, 97 F.C.C.2d 960, 962 (Rev. Bd. 1984)).

[95] The Commission has a number of rules to ensure that a broadcaster is responsive to the unique interests and needs of individual communities. For example, the Commission's main studio rule requires that a station maintain its main studio in or near its community of license to facilitate interaction between the station and the members of the local community it is licensed to serve. *See id.* § 73.1125. In addition, the main studio also must house a public inspection file, the contents of which must include "a list of programs that have provided the station's most significant treatment of community issues during the preceding three month period." *See id.* § 73.3526(e)(11)(i) (commercial TV issues/program list). The purpose of this requirement is to provide both the public and the Commission with information needed to monitor a licensee's performance in meeting its public interest obligation of providing programming that is responsive to its community. *See Revision of Programming and Commercialization Policies, Ascertainment Requirements, and Program Log Requirements for Commercial Television Stations*, MM Docket No. 83-670, Report and Order, 98 F.C.C.2d 1075, 1076, ¶ 2-3, 1107, ¶ 71 ("Commercial TV Deregulation Order") (explaining the purpose of issues/programs lists for commercial television).

[96] *See, e.g.*, Coalition comments at 10; MSTV comments at 4; NAB comments at 3; Sunbelt comments at 2. The principal community coverage rule requires a DTV broadcast station to provide a specified signal contour over its community of license to ensure that local residents receive service. *See* 47 C.F.R. § 73.625.

[97] *See* 47 U.S.C. § 307(b). When a broadcast station seeks to renew or transfer its license, it must give public notice to its community to ensure that members of the community have an opportunity to file a petition to deny if they object to the station's application for renewal or transfer of license. 47 C.F.R. § 73.3580.

[98] *DTS Notice*, 20 FCC Rcd at 17803-04, ¶ 18.

[99] *See id.* Disallowing such expansion is consistent with the statutory requirement to award new licenses through competitive bidding (auctions), as appropriate. *See* 47 U.S.C. § 309(j); *see also Implementation of Section 309(j) of the Communications Act -- Competitive Bidding for Commercial Broadcast and Instructional Television Fixed Service Licenses*, 13 FCC Rcd 15920-26, ¶ 14 (1998).

expansion will occur on a station's already occupied channel."[100] New stations, particularly in a geographically large DMA,[101] may be permitted to use the same channel and such expansion may also affect adjacent channel operations. We, thus, reject the DMA Approach and will not allow a DTS station to offer service beyond that station's authorized service area for its single-transmitter facility.

25. Furthermore, we will not give stations a blanket authorization to offer DTS service on a secondary basis throughout a station's DMA for the same reasons that we rejected the primary DMA Approach.[102] Many broadcast commenters advocated, as an alternative to primary service throughout a DMA, that we permit DTS broadcasters to serve an entire DMA on a secondary basis ("Secondary Service DMA Approach").[103] We seek to afford consistent treatment to both single-transmitter and DTS stations and find that special treatment is not necessary to implement DTS service. Permitting DTS service throughout a station's DMA, even on a secondary basis, threatens localism by distracting a station's focus from its community of license. Moreover, a Secondary Service DMA Approach might still preclude opportunities for new low-power stations. Finally, at this time, we do not seek to dramatically redefine the broadcast television service. We note, however, that DTV broadcasters may achieve the same goals sought by a secondary DTS service through the use of digital on-channel translator/LPTV stations under Part 74 of the rules.[104]

2. Table of Distances Approach Adopted

26. We adopt the proposed "Table of Distances" Approach[105] to define the limits of a DTS station's comparable service area. This Table defines each full-power DTV station's hypothetically maximized service area or, in other words, the maximum service area that can be obtained by DTV stations under our rules.[106] The Table, which is based on a set of distances from stations' reference points that reflect DTV stations' potential maximized facilities, will be used by DTV stations when applying to maximize facilities using a DTS network. We agree with MWG that this Table approach will define for DTS stations a comparable service area to

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[100] Coalition reply at 5 (claiming that "in almost all circumstances, a maximized, single-transmitter DTV facility will already have prevented new co-channel service because of the destructive level of interference that it would be predicted to cause to any service from a new full-power, LPTV, translator or Class A station co-channel operation.").

[101] For example, Denver DMA includes areas of northern Wyoming.

[102] *See supra* ¶¶ 20-24. We will, however, in some circumstances, permit incidental secondary service that results from the necessary placement of transmitters near the edge of a station's service area. *See also infra* ¶ 32.

[103] *See, e.g.*, Alliance at 2; Coalition comments at 2, 6-9; CDE comments at 1-2; KJLA et al. comments at 1; NAB comments at 4; Paxson comments at 5; RBI comments at 4; Sunbelt comments at 3-5; Penn State comments at 4; TVPlus comments at 6-7.

[104] *See supra* ¶ 18, *infra* ¶ 34. *See also* 47 C.F.R. § 74.701 *et seq*. We note that our existing rules do not preclude the use of on-channel digital translators.

[105] *DTS Notice*, 20 FCC Rcd at 17804-06, ¶¶ 20-23.

[106] The Table is based on the maximum height and power that a single-transmitter station would be allowed to apply for. *See* 47 C.F.R. § 73.622(f).

single-transmitter stations in a simple and straightforward manner.[107] Instead of individually calculating the theoretically maximized DTV service contours of each DTS station, the Table of Distances will simplify determinations of allowable coverage areas under our rules and will ensure consistent treatment of similarly-situated stations.[108] For the majority of DTV stations, the results under the Table approach will be the same as a station-by-station approach; however, the Table approach also accounts for cases of terrain blockage and will allow coverage to continue both for existing viewers and also for the portion of the authorized area that was previously blocked by terrain.[109] We find unpersuasive MSTV's concern that the Table approach may allow DTS broadcasters to extend service into adjacent DMAs,[110] as our rules would now allow such extension by single-transmitter stations.[111]

27. Specifically, we adopt the following Table of Distances.[112] As explained below, the distances represent circles within which DTS station coverage contours must be contained. In the vast majority of cases, the appropriate circle will equal or exceed a station's currently authorized coverage contour, including the contour within which the station will provide service at the end of the transition. The rule will provide for those exceptional situations in which this is not the case.[113]

Channel	Zone (see 47 C.F.R. § 73.609)	F(50,90) field strength	Distance from reference point
2-6	1	28 dBu	108 km. (67 mi.)
2-6	2 and 3	28 dBu	128 km. (80 mi.)
7-13	1	36 dBu	101 km. (63 mi.)
7-13	2 and 3	36 dBu	123 km. (77 mi.)
14-51	1, 2 and 3	41 dBu	103 km. (64 mi.)

[107] MWG comments at 13 (saying Table is likely simplest to administer); *see also* Alliance comments at 2. But see MSTV comments at 11 (concerned that Table may allow service into adjacent DMAs); and APTS comments at 1, 4-5 (prefers focus to be on population and viewers rather than geography).

[108] *DTS Notice*, 20 FCC Rcd at 17804, ¶ 20.

[109] *See infra* ¶¶ 29-31. For this reason, we apply 47 C.F.R. § 73.622(e)(1) to DTS stations, but not 47 C.F.R. § 73.622(e)(2). *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(b).

[110] MSTV comments at 11.

[111] 47 C.F.R. § 73.622(f). *See also* Coalition reply at 4, n.8.

[112] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(c).

[113] See Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(2). This situation will occur where a station's authorized single-transmitter antenna height above average terrain ("HAAT") exceeds the standard maximum HAAT (Section 73.622(f) of our rules specifies an HAAT associated with the maximum allowed power, and any increase in HAAT above that height requires a corresponding decrease in the allowed maximum power) and where the average terrain elevation in different directions from the station's transmitter site are significantly different from each other. *See infra* ¶ 31.

28. Waiver policy. We adopt a waiver policy to enable stations to address the type of loss experienced by WECT, Wilmington, NC (channel 6), where many analog viewers of that station lost service when the station transitioned to digital-only operations. Notwithstanding our Table of Distances, on a case-by-case basis, we will permit a station to use DTS if doing so will enable it to continue to serve its existing analog viewers within its analog Grade B contour who would otherwise lose service as a result of its transition.[114] Moreover, we will consider a station's DTS proposal to serve lost analog viewers of another station affiliated with the same network, provided the station is geographically close to the affected area and use of DTS would not cause impermissible interference to another station. Because the purpose of this waiver policy is to maintain service to existing viewers after the digital transition, we will limit the use of DTS under this waiver policy to stations that apply by August 18, 2009 to provide such service and commit to build the DTS facility as quickly as possible.[115] We urge stations to determine now if they anticipate such a loss of service to current analog viewers and to apply as soon as possible to obtain an STA for DTS operation under the interim policy so that they can continue to provide uninterrupted service to the current analog viewers within their analog Grade B contour after they terminate their analog service.[116] We delegate authority to the Media Bureau to consider waiver requests, which must be made in accordance with existing Commission rules.[117] After the new DTS rules and forms take effect, stations must apply to modify their facilities in order to obtain licensed authority to operate using DTS.

29. Reference point. The reference point is one of the parameters used to calculate the area described by the Table of Distances. We will determine each DTS station's reference point using the allotment established in the Commission Order that created or made final modifications to the post-transition DTV Table,[118] and the corresponding facilities for the station's channel assignment[119] as set forth in that Commission order.[120] In the *DTS Notice*, the Commission proposed use of a station's reference point in its certification (FCC Form 381) filed in connection with DTV channel election process;[121] however, we find that the new post-

[114] We will allow stations to apply for a waiver to use DTS to serve their former analog viewers even if there is another affiliate of the same network that will serve them, provided such service would not cause impermissible interference to another station. In acting on waiver requests, we may consider, among other things, the extent to which the area is currently served by other affiliates of the same network.

[115] We believe that providing the flexibility to apply within six months after the transition date will allow stations to deal with unforeseen circumstances that come to light when they make their transition.

[116] *See supra* ¶ 11.

[117] *See* 47 C.F.R. § 1.3 (waiver requests).

[118] 47 C.F.R. § 73.622(i).

[119] *See, e.g.*, *Seventh Report and Order*, 22 FCC Rcd at 15672, app B; *First Order on Reconsideration*, 23 FCC Rcd at 4311, app B.

[120] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(c)(2).

[121] In November 2004, licensees filed certifications via FCC Form 381 in order to define their proposed post-transition facilities. In these certifications, licensees chose whether to (1) replicate their allotted facilities, (2) maximize to their currently authorized facilities, or (3) reduce to a currently authorized smaller facility. *See* Public Notice, "DTV Channel Election Information and Deadlines," 19 FCC Rcd 19569 (MB 2004) ("Certification (continued....)

transition DTV Table now provides a more relevant reference point.[122] Generally, a station would use its current reference point based on its Appendix B facility or the Order granting it a new channel, as appropriate.[123] Upon the appropriate public interest showing, a station may request a change to its reference point, just as stations have done historically, provided certain criteria are met.[124] Such changes in reference points are subject to a station showing that the resulting service area circle fully encompasses the station's authorized service area.[125] We decline to adopt the MWG additional proposal of allowing changes to reference points based on whether a DTV City Grade signal could be delivered over the principal community from a hypothetical maximized facility located at the proposed reference point, since this criteria could allow stations to move the center of their coverage area to nearly 90 km from the principal community.[126]

30. Uniform terrain. In parts of the country where the terrain is uniform, the Table of Distances illustrates the area that a station could serve if it operated a single-transmitter facility at the maximum effective radiated power ("ERP") and antenna height above average terrain ("antenna HAAT") allowed by our rules.[127] Reliance on this Table will facilitate licensees' use of DTS by eliminating the need for a two-step process: first, calculating the antenna height necessary to match the maximum allowed average antenna height and power for a single transmitter and, then, calculating the distances to the service contour in every direction based on the antenna HAAT in that direction. In most cases, the Table will match the potential maximized facilities of single-transmitter stations because most stations are not in areas where variations in the terrain result in significant variations in the coverage.

31. Irregular terrain. We also will use the Table of Distances in areas in which irregular terrain is an issue.[128] In such locations, single-transmitter stations' maximum service areas are distorted from a circular coverage contour to varying degrees. Where coverage does not reach as far due to terrain in one direction, a station would have a correspondingly larger coverage distance in other directions. In these cases, stations' single-transmitters may be authorized to serve people outside of the circular coverage contour because the average terrain

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Deadline PN"). Stations that did not submit certification forms by the deadline were evaluated based on replication facilities. *See Second DTV Periodic Report and Order*, 19 FCC Rcd at 18296, ¶ 41.

[122] The post-transition DTV Table is based on the results of the Commission's channel election process. The Commission attempted to accommodate broadcasters' channel preferences as well as their replication and maximization service area certifications (made via FCC Form 381). *See Seventh Report and Order*, 22 FCC Rcd at 15583, ¶ 2.

[123] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(c)(2).

[124] *See* 47 C.F.R. §§ 76.511 and 73.622(d). *See also* 47 U.S.C. §§ 307, 308 and 309.

[125] MWG comments at 12.

[126] The 48 dBu DTV city grade contour extends approximately 90 km from the transmitter site for channels 14-51, assuming a fully maximized station with 1000kW ERP at 365m HAAT.

[127] *See* 47 C.F.R. § 73.622(f).

[128] Coverage contours of stations using non-directional transmitting antennas will be circular except where the surrounding terrain has a different average height in different directions. For example, if the average terrain to the North is 500 feet above mean sea level and the average terrain to the South is 1000 feet above mean sea level, the coverage contour will extend further to the north than it does to the south.

calculation has allowed the station to be authorized for a larger coverage contour in one direction (one that would not have been reached if there was no terrain issue). In these circumstances, we will permit stations to provide DTV service within their authorized coverage area.

32. Location of DTS Transmitters. We require that each DTS transmitter be located within either the DTV station's Table of Distances area or the station's authorized service area (*i.e.*, predicted noise-limited service contour ("PNLC").[129] We disagree with MWG and the Coalition that there may be situations where placement of a DTS transmitter outside of a station's authorized service area may be necessary to provide meaningful service to the communities that are near the edge of the station's PNLC.[130] We find that transmitters placed inside, but near the edge of, a station's authorized service area can adequately serve the communities in that area.

33. DTS Coverage. We require that each DTS transmitter's coverage must be contained within either the DTV station's Table of Distances area or its authorized service area, except where such extension of coverage beyond the station's authorized service area is of a minimal amount and necessary for the station to provide coverage to its entire authorized service area.[131] The coverage for each DTS transmitter is determined based on the F(50,90) field strength given in the Table of Distances, calculated in accordance with Section 73.625(b). The combined coverage of a DTS station is the logical union of the coverage of all DTS transmitters.[132] We recognize, and agree with commenters, that in circumstances where transmitters are placed inside but near the edge of a station's authorized service area, it may be technically difficult to ensure that signals from that transmitter will not carry beyond the station's authorized service area.[133] For most stations, our decision to use the Table of Distances based on maximum facilities will allow them flexibility to cover their entire authorized service area with DTS service. For those situations in which a station's authorized service area extends beyond its Table of Distances coverage, we will consider, on a case-by-case basis, requests to locate a DTS transmitter inside, but near the edge of, the station's authorized service area with facilities that may result in signal transmissions beyond that area by a minimal distance.[134] Such placement must be shown to be necessary to adequately serve the population inside of a station's authorized service area.[135] In addition, DTS transmitters will be limited to power levels such that any individual DTS transmitter's coverage would only exceed the station's authorized service area by

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[129] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(6). *See also DTS Notice*, 20 FCC Rcd at 17802, ¶ 14.

[130] *See* Coalition reply at 7; MWG comments at 13.

[131] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(2). Stations may not extend coverage beyond their authorized service area, unless it is necessary to serve their entire authorized service area. Stations are not required to cover their entire Table of Distances area.

[132] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(d).

[133] *See, e.g.*, APTS comments at 5.

[134] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(2). This rule represents an exception to the prohibition of secondary DTS service beyond a station's authorized service area. *See supra* ¶ 25. We recognize that such service may also be necessary for stations to serve an area within the current analog Grade B that is not within the station's digital service contour, as permitted by the waiver process discussed *infra* ¶ 28.

[135] *See id.*

a minimal amount. We note that the Commission has considered such a request under the interim DTS policy.[136] We will not protect DTS service from another DTV station's interference beyond the station's authorized service area and DTS signals beyond the authorized service area must protect other authorized DTV facilities.[137] We delegate authority to the Media Bureau to consider these requests.

34. Digital On-Channel Translator. Alternatively, as previously noted,[138] stations seeking to serve the communities near the edge of their PNLC may apply for a digital on-channel translator/LPTV station. Authority for operation of digital on-channel translator/LPTV station was established in the *Digital LPTV Report and Order*, in which the Commission permitted digital LPTV and TV translator stations to retransmit programming directly received on the same TV channel with the consent of the licensee of the original input signal.[139] Digital on-channel translator/LPTV stations must be separately licensed (on a secondary basis) under Part 74 of the rules.[140] The on-channel translator/LPTV station is technically equivalent to an on-channel booster.[141] However, unlike a booster, the protected signal contour of an on-channel translator/LPTV station is not confined to the protected contour of the associated TV broadcast station. Applications for new on-channel translator/LPTV stations must be filed in the same manner as other applications for new TV translator or LPTV stations. The proposed facilities of these stations are subject to the interference standards, criteria and procedures applicable to other LPTV and translator applications.

35. "Largest Station" Alternative. As an alternative to the Table of Distances Approach for determining the hypothetically maximized service area, full-power stations may use the "largest station" provision in section 73.622(f)(5) of the rules.[142] Section 73.622(f)(5), which seeks to equalize the coverage areas of all stations within a market and address disparities

[136] *DTS Notice*, 20 FCC Rcd at 17798-99, ¶ 4.

[137] *Id.* at 17799, ¶ 5.

[138] *See supra* ¶¶ 18, 24.

[139] *Digital LPTV Report and Order*, 19 FCC Rcd at 19415, ¶ 249.

[140] *See* discussion *infra* Section IV.E.

[141] To the extent that a station demonstrates a need to use a non-synchronized, on-channel digital booster to serve terrain-shadowed portions of their service areas (much in the same manner as analog boosters are used), we will permit stations on a case-by-case basis to request STA to use an on-channel digital booster. Consideration of authorizing a digital booster service may be more appropriately addressed in the *Digital LPTV* docket. *See DTS Notice*, 20 FCC Rcd at 17810-11, ¶ 39. *See also* Alliance comments at 5; Merrill Weiss comments at 25; Sunbelt comments at 4-5; TVPlus comments at 8-9; WOGF reply at 4.

[142] 47 C.F.R. § 73.622(f)(5). Section 73.622(f)(5) provides that licensees assigned a DTV channel in the initial DTV Table of Allotments may request an increase in either effective radiated power ("ERP") in some direction or antenna height above average terrain ("antenna HAAT") that exceeds the initial technical facilities authorized for the allotment. 47 C.F.R. § 73.622(f)(5). Such increases are limited to maximum powers specified in paragraphs (f)(6) through (f)(8) of that section. *Id.* § 73.622(f)(6)-(8). Where specified antenna HAAT values are exceeded, the maximum ERP generally is reduced in accordance with the appropriate chart or formula in those paragraphs. Paragraph (f)(5) also allows the maximum ERP and HAAT combination to be "up to that needed to provide the same geographic coverage area as the largest station within their market, whichever would allow the largest service area." *Id.* § 73.622(f)(5). Such requests must include an engineering showing that the increase would not result in new interference.

between VHF and UHF stations, permits stations to exceed the ERP and antenna HAAT limits in order to "provide the same geographic coverage area as the largest station within their market."[143] This rule was clarified in the 2001 *First DTV Periodic Report and Order*.[144] In comments, the Coalition and KJLA advocate that we permit DTS stations to also use this rule to maximize their service area.[145] We agree that the service areas available to single-transmitter stations should also be available to DTS stations.[146] To the extent that a single-transmitter station may now seek an increased coverage area under section 73.622(f)(5), we will permit a DTS station to do the same.[147] Unlike single-transmitter stations, DTS stations likely will not actually need to exceed the ERP and antenna HAAT limits in order to provide the same geographic coverage area as the largest station within their market. Thus, DTS stations seeking to maximize under this rule to cover an area greater than can be covered using the values in the Table of Distances may request an increase in ERP and antenna HAAT values to determine the circle within which all DTS station coverage contours must be contained. In other words, DTS stations may obtain the same coverage under the rule as would a single-transmitter station, provided the DTS service would not result in new interference.

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[143] *See id. See also Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, MM Docket No. 87-268, Sixth Report and Order, 12 FCC Rcd 14588, 14595-14607 ¶¶ 12-33 (1997) ("*Sixth Report and Order*") (establishing the initial DTV Table of Allotments and adopting section 73.622 of the rules).

[144] *See Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television*, MM Docket No. 00-39, Report and Order, 16 FCC Rcd 5946, 5973-4, ¶¶ 73-4 (2001) ("*First DTV Periodic Report and Order*"). In clarifying the rule, the Commission stated: "First, the maximum ERP limits (1000 kW for UHF channels 14-69 in any zone; 30 kW for VHF channels 7-13 in Zone 1; 160 kW for VHF channels 7-13 in Zone 2 or 3; 10 kW for VHF channels 2-6 in Zone 1; and 45 kW for VHF channels 2-6 in Zone 2 or 3) may not be exceeded. The "largest station" provision applies only where the rules normally require a reduction in the maximum power because a specified antenna HAAT is exceeded. That is, it does not allow power higher than the maximum ERP to compensate for an antenna HAAT that is lower than the value specified in the rule. Second, the "largest station" provision is only triggered where a station in the same market is serving a larger area than could be covered with the standard maximum power and antenna height specified in section 73.622 (f) of the rules. Otherwise, applicants must comply with the maximum power and antenna height in that rule section. Third, for the purpose of this rule, stations in the same DMA are considered to be in the same market. Fourth, the geographical coverage determination is based on the area within the DTV station's noise-limited contour, calculated using predicted F(50,90) field strengths as set forth in section 73.622(e) of the rules and the procedure specified in section 73.625(b) of the rules. Under this provision an application may not request a power and antenna height combination that would result in coverage of more square kilometers of area than the largest station in the market. It is not necessary that the application specify coverage that is congruent with or encompassed by the coverage area of the largest station. Stations are not expected to shift their coverage area in order to use this provision of the maximum power rules. Finally, DTV stations are still subject to the interference protection requirements, even when availing themselves of this provision."

[145] The Coalition and KJLA say that stations should be able to choose the larger of (1) the hypothetically maximized service area using the Table of Distances Approach or (2) "the service area of the station in the DMA with the greatest population and coverage area" (their so-called "Equal Service Area Approach"). *See* KJLA comments at 3; Coalition reply at 5. We note that this proposal refers to population when only geographic area is considered by section 73.622 (f)(5). In conjunction with this approach, the Coalition again seeks secondary DTS service throughout a DMA. As explained above, we decline to authorize secondary DTS use throughout the DMA to which a station is assigned by Nielsen.

[146] *See also* MWG comments 13.

[147] *See infra* ¶ 40 (explaining the licensing rules applicable to single-transmitter stations, including section 73.622(f)(5), will apply to DTS stations).

36. In addition, MSTV expresses interest in using "DTS to expand service into traditionally underserved rural areas in which populations have historically been insufficient to sustain a viable, full-service over-the-air station."[148] We believe the rules we adopt here address MSTV's interest. As noted above, under Part 74 of our rules, DTV stations may now offer expanded service on a secondary basis through use of either a digital LPTV or digital translator station.[149] We expect that the same technologies used by DTS will offer stations the ability to use a synchronized on-channel digital translator to achieve the goal of reaching traditionally underserved rural areas, while minimizing mutual interference with the parent station.

3. "Cherry-picking" Prohibited

37. We adopt our proposal in the *DTS Notice*[150] to require that DTS stations provide at least the same level of service they would provide were they using their single-transmitter facilities. Specifically, we will not accept an application proposing use of DTS if the combined coverage from all of the transmitters fails to cover the entire area within the applicant's authorized service area.[151] Further, each DTS transmitter's coverage must be contiguous with at least one other DTS transmitter's coverage.[152] We find that this rule will prevent stations from using DTS technologies to favor some populations within their service area over others, a practice sometimes referred to as "cherry-picking."[153]

38. Most commenters agree that "cherry-picking" should be prohibited.[154] CDE, however, disagrees that a cherry-picking rule is necessary, saying that DTS stations have no greater incentive than single-transmitter stations to reduce service via cherry-picking.[155] CDE also says "existing rules for serving certified populations are more than sufficient to prevent reduction in service."[156] We disagree and find that the use of a multiple-transmitter system in lieu of a single-transmitter facility by DTS broadcasting presents an opportunity for abuse that must be contained before it starts. While the incentive to fully serve a coverage area, whatever it may be, may be the same for DTS and single-transmitter stations, alike, the opportunity to pick and choose populations within the station's service area is not. Existing viewers, including those in sparsely populated areas, rightly will expect to receive television service regardless of the technology employed by the station. Therefore, because of the different means that DTS and single-transmitter stations will use to deliver service, we find it necessary to impose restrictions

[148] MSTV comments at 11.

[149] *See supra* ¶ 18.

[150] *DTS Notice*, 20 FCC Rcd at 17806, ¶ 25.

[151] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(1).

[152] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(f)(3).

[153] As discussed *infra*, stations applying to use DTS must have an authorized service area or establish an authorized service area prior to filing their DTS application. *See infra* ¶ 40.

[154] *See, e.g.*, Harris comments at 3; NAB comments at 3; NAF et al. comments at 15; Paxson comments at 14; Smith comments at 3.

[155] CDE comments at 2 (saying "the concern over cherry-picking by a broadcaster employing DTS is predicated on an incentive to reduce service that is greater than the incentive for a single-stick broadcaster").

[156] *Id. See also* APTS comments at 1, 4-5.

to eliminate the opportunity for "cherry-picking." We recognize, however, that some difference in coverage between conventional and DTS operations may be unavoidable, but we intend to keep this concern and public service obligations in mind when we review applications to use DTS technologies.

39. Specifically, we adopt the proposed contour overlap method to prohibit "cherry-picking."[157] This is the same approach used under the interim rules.[158] The contour overlap method evaluates whether a DTS station would serve "essentially all of its replication coverage area;" or, in other words, whether all viewers within a station's replicated service area are predicted to be served by a station's current transmitter.[159] Contour overlap ensures that the station's service area is contiguous and does not consist of unconnected areas of service separated by populated areas that are not served.[160] This rule furthers one of the major goals of adopting DTS, which is to provide improved service, particularly in geographic areas that have been difficult to reach with the signal from a single transmitter. Accordingly, we will deny any application to construct DTS facilities that would result in a loss of service to the population currently served within the licensee's service contour. We agree with MWG that this will be an effective way of assuring that the population within a station's service area receives service.[161] We will require that these viewers be predicted to receive the minimally necessary signal strength (based on the FCC curves F(50,90) propagation model) from at least one DTS transmitter.[162] We will keep the same considerations in mind in evaluating any requests for waiver to provide service to current analog service areas within the station's analog Grade B contour.[163]

D. Licensing and Technical Rules

40. We adopt our proposals in the *DTS Notice* to apply to DTS stations the Part 73 licensing and technical rules that apply to DTV single-transmitter stations. The record supports this conclusion and we address the specific provisions of the new rules in the section below. As we discuss below, stations that wish to apply to use DTS under the new rules may do so after the rules take effect and the new forms and processing program are available.[164] Until the new rules and forms are effective, stations may apply to use DTS under the existing interim policy as a

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[157] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(d).

[158] *DTS Notice*, 20 FCC Rcd at 17798-99, ¶ 4 (requiring that DTS provide service to essentially all of a station's replication coverage area).

[159] *See supra* note 4 (noting that under the interim rules, we require that the combined DTS noise-limited service be provided over all of a station's replication service area and requiring overlapping contours to be sure that every location in a station's replication service area is within the PNLC of at least one proposed DTS transmitter).

[160] This rule and the general prohibition on cherry-picking also applies to stations using DTS to maximize beyond their current service contour.

[161] MWG comments at 16.

[162] *See* Appendix B – Rule Changes; 47 C.F.R. § 73.626(d).

[163] *See* discussion of waiver policy *supra* ¶ 28.

[164] *See* discussion of licensing process *infra* ¶ 43.

request for STA.[165] A station that wishes to use DTS to ensure uninterrupted service for its current analog viewers may apply under the interim policy and request a waiver, if necessary.[166] The record is insufficient to support use of DTS for new stations that do not yet have an authorized service area. Accordingly, stations applying to use DTS must have an authorized service area or establish an authorized service area prior to filing their DTS application. If there is demonstrated interest in or need for DTS as an option for new stations, we can initiate a rulemaking or interested parties may file a petition for rulemaking.

1. Technical Rules: Power, Antenna Height, and Emission Mask

41. We adopt our proposal in the *DTS Notice*[167] to apply to DTS stations the Part 73 DTV effective radiated power ("ERP"), antenna height above average terrain ("antenna HAAT") and emission mask rules applicable to single-transmitter stations.[168] The record supports this conclusion.[169] We will require that each transmitter in a DTS system conform to the maximum power and emission mask requirements applicable to single-transmitter stations.[170] We find that this approach will offer DTS stations flexibility in designing their system to maximize DTV service, while limiting their potential for causing interference, in light of the service area limitations adopted above[171] and the post-transition interference protection requirements that were adopted in the *Third DTV Periodic Report and Order*.[172]

42. We apply to all primary DTS transmitters the full-power DTV emission mask rules.[173] We decline to adopt relaxed out-of-band emission designator mask requirements for very low power DTS transmitters, as requested by Harris.[174] We recognize that secondary stations, such as digital LPTV and translators, may now use relaxed emission masks[175] and that applying those standards to low-power primary DTS transmitters may offer some cost savings.[176] But we agree with MWG that when transmitters are located in dense RF environments, such as when multiple stations build a common DTS network with collocated transmitters, there might be a significant increase in the noise floor that could affect all of the stations.[177] We find that the

[165] 47 C.F.R. § 73.1635.

[166] *See* discussion of waiver policy *supra* ¶ 28.

[167] *DTS Notice*, 20 FCC Rcd at 17807, ¶ 27.

[168] *See* 47 C.F.R. § 73.622(f).

[169] *See, e.g.,* CDE comments at 2; Harris comments at 2-4; KJLA *et al.* comments at 2; MSTV comments at 10; MWG comments at 17; NAB comments at 3; Paxson comments at 14; Smith comments at 3-4.

[170] We are convinced by MWG who argues that the relative powers of distributed transmitters in a network must be carefully chosen to optimize the service the network provides and should not be unnecessarily constrained.

[171] *See* discussion of DTS service area *supra* Section IV.C.

[172] *See* 47 C.F.R. § 73.616. *See also Third DTV Periodic Report and Order*, *supra* note 17, at Section V.F.

[173] *See* 47 C.F.R. § 73.622(h)(1).

[174] Harris comments at 3-4.

[175] *See* 47 C.F.R. § 74.794(a)(2).

[176] *See* Harris comments at 4; MWG Reply Comments at 12.

[177] MWG reply at 11.